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SUPPLEMENT

TO

1942

BRITANNICA BOOK OF THE YEAR

Recording developments of particular
interest to Great Britain and the
British Empire

PUBLISHED BY

THE ENCYCLOPÆDIA BRITANNICA CO., LTD.

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INTRODUCTION

IN this, the third year of war, we again offer to our readers a survey and record of the year planned and carried through on the same scheme as proved so successful for the year books issued in 1941 and 1940.

In pre-war years the BRITANNICA YEAR BOOK was issued in two separate but similar editions, one for American circulation and one for circulation in Great Britain and the British Empire. The need for economy in materials and in man power compelled the publishers to retain one edition only and war conditions dictated that that should be the American edition. Only in the United States has it been possible to produce a major work of this character.

As before, the volume is prefaced by an introductory supplement of some thirty thousand words, dealing in detail with war time topics of specific interest to British readers.

To non-American readers the 1940 and 1941 year books, which included many hundreds of thousands of words from British contributors, proved to have a special interest and value ; in the present circumstances of alliance and close co-operation the publishers confidently expect that an even more valuable service will be performed by this, the 1942 BRITANNICA BOOK OF THE YEAR.

M. D. LAW.

LONDON, *March* 1942.

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DIARY OF EVENTS THROUGHOUT THE BRITISH EMPIRE

EXCLUDING THE COURSE OF HOSTILITIES

From January 1, 1941—December 31, 1941

1941

Jan. 1: **Australia.**—It was announced that 496 survivors of British, French and Norwegian ships, including some women and children, who had been landed by German commerce raiders on the island of Emirau in the Bismarck archipelago on Dec. 21, had been rescued by naval units and brought into an Australian port.

Jan. 3: **India.**—Under the Defence of India rules Maulana Abdul Kalam Azad, president of the Congress party, was arrested.

Jan. 5: **United Kingdom.**—Baling out from an aircraft which dived into the Thames estuary, Miss Amy Johnson, the airwoman, was drowned.

Jan. 7: **United Kingdom.** The archbishop of York's conference opened at Malvern to discuss the Church's opportunity for inspiration with regard to a new order of society after the war.

Jan. 8: **Kenya.**—Lord Baden-Powell, the chief scout, died in his 84th year.

Jan. 9: **United Kingdom.**—In reply to President Roosevelt's personal request, the British government agreed to allow from America limited supplies of vitamin concentrates, condensed milk and babies' clothing into unoccupied France.

The ministry of food announced that the weekly meat ration, which on Jan. 6 was reduced to 1*s.*, and from that date included pork and most offals, would be fixed weekly within the range of 1*s.* to 1*s.* 6*d.*

Jan. 15: **Canada.**—Disagreement over consideration of the Rowell-Sirois report led to a breakdown of the dominion and provincial governments conference at Ottawa on financial and constitutional reforms.

Jan. 16: **United Kingdom.**—It was announced that monetary aid from the colonial empire by the end of 1940 totalled over £18,250,000.

Jan. 17: **United Kingdom.**—Promotion of music and art in war-time was guaranteed by a further grant of £12,500 from the Pilgrim Trust to the Council for the Encouragement of Music and the Arts, and a similar allocation from the treasury.

Jan. 20: **United Kingdom.**—Orders were issued giving details of the government's scheme for compulsory fire-prevention.

Jan. 21: **United Kingdom.**—Mr. Bevin in the House of Commons outlined his plan for industrial registration by age groups.

The Daily Worker and *Week* were suspended under Defence Regulations.

India.—Announcement was made of a resolution by Sikh leaders to form a Defence of India League to secure the maximum effort by the Sikhs in defence of India and to ensure British victory.

Jan. 25: **Hong Kong.**—The King replied to the resolution of devotion and loyalty passed by the legislative council on the 100th anniversary of the colony's foundation.

Jan. 26: **Australia.**—Serious losses in life and property were reported from the worst floods in the history of South Australia.

Jan. 27: **South Africa.**—Additional estimates for war expenditure totalling £15,000,000 were proposed in parliament.

Jan. 29: **United Kingdom.**—The King signed a proclamation extending the application of the National Service Act to six new age groups—men of 18, 19, 37, 38, 39 and 40.

Feb. 1: **United Kingdom.**—The new Air Training Corps was constituted.

South Africa.—Many people, mostly soldiers on leave, were injured in Johannesburg in serious political rioting, arising from street clashes between soldiers and members of the Ossewabrandwag.

Feb. 4: **United Kingdom.**—Stories were disclosed of the abnormally severe weather experienced in early and mid-January.

South Africa. A national security code for the Union and South-west Africa was promulgated with immediate application.

Feb. 6: **United Kingdom.**—New schedules for world broadcasting, totalling 54 programme hours daily, were announced by the director-general of the B.B.C.

Calling for a vote of credit of £1,000,000,000 for 1941-42, the chancellor of the exchequer said that the daily cost of the war had risen to over £10,500,000.

Feb. 13: **United Kingdom.**—Sir Kinahan Cornwallis was appointed ambassador in Baghdad.

Canada.—It was announced that during the year the government were to construct a chain of airports from Alberta to the Yukon as a defence measure.

Feb. 18: **Canada.**—The largest budget in dominion history called for an appropriation of £290,000,000 for war purposes.

Northern Rhodesia.—Findings were published of the commission of inquiry into the April 1940 disturbances in the Copperbelt.

Feb. 20: **Malta.**—Regulations were issued for compulsory service of males between the ages of 18 and 41 in combatant capacities. Those between the ages of 16 and 56 became liable for other duties.

United Kingdom. After a tour of inspection of the A.I.F. in the middle east, Mr. Menzies, prime minister of Australia, arrived in England.

Feb. 23: **United Kingdom.**—Mr. Amery, secretary of state for India, broadcast on India's part in the war and emphasized that the declared goal of British policy for India was her free and equal partnership in the British commonwealth.

Feb. 24: **Newfoundland.**—Sir Frederick Banting, discoverer of the insulin treatment for diabetes, who had been missing since Feb. 21, was found dead in aeroplane wreckage at Trinity Bay.

March 1: **New Zealand.**—The free medical service provided for in the Social Security Act came into operation.

March 3: **United Kingdom.**—To assist the national food and shipping problem, reductions in service rations were announced.

News was released of the great snowstorm in the north in February, believed to be the most severe since 1888.

March 5: **Eire.**—Mr. Frank Aiken, minister for the co-ordination of defence measures, left for the U.S. on an arms-and supply-buying mission.

March 10: **United Kingdom.**—An order was made restricting meals in hotels and catering establishments to one of five main dishes—fish, meat, poultry, eggs or cheese.

March 12: **United Kingdom.**—*Die Zeitung*, a German language newspaper, made its first appearance in London.

South Africa. The new budget introduced many tax increases and provided for a total defence expenditure of £72,000,000, the balance to be obtained by loan.

Jamaica.—Suggested constitutional changes in Jamaica were announced in the British House of Commons.

March 15: **New Zealand.**—It was announced by the New Zealand high commissioner in London that 20 estates comprising 29,000 acres had already been bought by the New Zealand government for settlement of dominion soldiers after the war.

March 16: **United Kingdom.**—Mr. Ernest Bevin announced new arrangements to increase man- and woman-power for work of national importance, involving the registration of men between 41 and 45, and of women of 20 and 21.

March 17: **United Kingdom.**—Jam, marmalade, syrup and treacle were rationed, the allowance being 8 oz. of any one of these per person monthly.

Eire.—In a St. Patrick's day broadcast to the U.S.A., Mr. de Valera said that neutrality represented the determined will of the Irish people.

March 18: **India.**—The chamber of princes adopted a resolution calling for the establishment of a war advisory council through which the Indian States could co-operate with the provincial governments in prosecution of the war.

March 19: **Canada.**—An agreement was signed with the United States for the immediate development of the Great Lakes and the St. Lawrence river seaway and power project.

March 23: **United Kingdom.**—The King and Queen with the two princesses observed the national day of prayer in a small country church. Throughout the Empire people joined in the day's observances.

March 25: **United Kingdom.**—The minister of food announced that communal

feeding centres, already established in over 100 towns, were being renamed "British Restaurants." In the London area 147 had been set up.

March 26: **United Kingdom.**—The War Damage bill became law, and the National Service bill to make civil defence compulsory passed its second reading by 176 to 4.

March 31: **Burma.**—The new flag was hoisted by the governor, Sir Archibald Cochrane, at a ceremony in Rangoon.

Borneo.—On the occasion of the centenary of the Brooke rule in Sarawak, the Rajah, Sir Charles Vyner Brooke, renounced the absolute legislative power and proposed that the committee of administration be entrusted with the drafting of a liberal constitution.

April 1: **United Kingdom.**—Supplies of animal feeding-stuffs were reduced to ⅛ of pre-war rations.

April 2: **Eire.**—Tea was rationed, the allowance being 1 oz. per person weekly.

April 4: **Australia.**—The projected establishment of a permanent joint committee with New Zealand to discuss common defence and economic problems was announced.

April 6: **The War.**—The Germans attacked Yugoslavia and Greece.

April 7: **United Kingdom.**—In the new budget income tax was raised to 10*s.* in the pound.

April 9: **United Kingdom.**—Total war casualties to date were given as 29,856 civilians killed, and 40,897 wounded, and 37,607 members of the armed forces killed and missing and 25,895 wounded.

April 14: **United Kingdom.**—The war savings campaign reached the £700,000,000 mark.

April 16: **United Kingdom.**—The last remaining Crystal Palace tower was demolished, providing 800 tons of scrap iron.

April 17: **Kenya.**—The governor announced a forthcoming excess profits tax of not less than 60 per cent. Similar measures were being taken in Tanganyika, Uganda and Zanzibar.

United Kingdom.—The business assets insurance scheme under the War Damage Act came into operation.

Palestine.—The Emir Abdul Ilah, regent of Iraq, arrived in Jerusalem, whither he had fled after the Iraqi revolt.

April 19: **United Kingdom.**—The first registration of women under the Employment Order 1941, comprising the 1920 class, took place.

April 21: **India.**—Fifty people were reported killed and more than 300 injured in three-day riots at Ahmedabad between Sikhs and Moslems.

April 22: **United Kingdom.**—The British Empire medal was instituted as a military and civil award.

April 24: **South Africa.**—It was announced that, owing to the short wheat crop, a standard wholemeal loaf would replace white bread throughout the Union on May 1.

April 30: **Canada.**—New taxes and substantial increases in existing taxation were imposed in the new budget, to provide an additional revenue of $300,000,000 annually.

Eire.—The Dail voted £8,383,556 for the army for 1941–42.

May 1: **United Kingdom.**—Lord Beaverbrook was appointed minister of state, and Col. Moore-Brabazon minister of aircraft production. A peerage was conferred on Mr. F. J. Leathers, who was appointed minister of shipping and transport.

May 4: **United Kingdom.**—Double summer time came into operation, clocks being put forward two hours in advance of Greenwich mean time.

May 5: **Northern Rhodesia.**—The government offered £296,000 to Britain for the war effort, £50,000 to be for fighter aircraft.

United Kingdom.—Cheese was rationed.

May 6: **South Africa.**—Parliament adjourned after a session in which a number of social measures passed included a workmen's compensation act, a factories' act and an act to enable South African soldiers outside the Union to vote in the South African elections.

May 7: **United Kingdom.**—A vote of confidence in the government was carried by 447 votes to 3. Mr. Churchill replied in parliament to critics of his policy.

Eire.—In the new budget income tax was raised to 7*s.* 6*d.* in the pound.

Canada.—Mr. Menzies, prime minister of Australia, addressed the Commons from the floor of the house.

May 8: **United Kingdom.**—A new charter for seamen provided, among other measures, for a merchant navy reserve pool.

May 10: **United Kingdom.**—Rudolf Hess, Hitler's deputy, landed by parachute near Glasgow and later was held as a prisoner of state.

May 14: **Nyasaland.**—A gift of £39,150 to Britain marked the 50th anniversary of the protectorate.

May 19: **United Kingdom.**—War credits to date amounted to £4,800,000,000, and the total increase in taxation since the autumn of 1939 was £788,000,000.

May 20: **United Kingdom.**—The Fire Services (Emergency Provisions) bill, authorizing the government to establish a national fire brigade service in war-time, passed all its stages.

May 24: **South Africa.**—The King conferred field-marshal's rank on Gen. Smuts on his 71st birthday.

May 28: **India.**—Communal disturbances in Bombay resulted in the deaths of 29 people and a total of 178 injured.

June 3: **United Kingdom.**—Clothing, including footwear, was rationed. Each person was allowed 66 clothing coupons for 12 months.

June 6: **Australia.**—The minister for air announced that a Royal Australian air cadet corps was to be constituted on the lines of that in the United Kingdom.

June 11: **New Zealand.**—Married men from 18 to 45 were ordered by proclamation to enrol for military service. Men of 21 to 40 would be balloted for overseas service.

June 12: **India.**—Details were published of the destruction caused by cyclone in Bengal on May 25, when more than 4,000 people were killed.

June 13: **United Kingdom.**—Civilian casualties for April were 6,065 killed, 6,926 injured; for May, 5,394 killed, 5,181 injured and 75 missing.

India.—Under a reorganization scheme involving units of the Indian Territorial force, it was stated that five new regiments were being added to the Indian army.

June 14: **United Kingdom.**—Changes in the food rationing system included an increase in the domestic cheese ration and reduction of the butter ration from June 30, and doubling of the preserves ration from August.

June 17: **Australia.**—New measures for expanding the war effort included the appointment of a minister of supply and a minister to co-ordinate civil defence, further petrol rationing, immediate prohibition of strikes and lock-outs, and enlistment of women for war industries.

June 18: **Canada.**—More than 2,400 Canadians were stated to be studying for service as radio-location operators in Britain.

United Kingdom.—Owen Tudor, ridden by W. Nevett, won the New Derby at Newmarket.

June 20: **United Kingdom.**—Mr. Fraser, prime minister of New Zealand, arrived by air.

June 22: **The War.**—Russia, invaded by Germany, was promised full aid by Mr. Churchill.

June 26: **United Kingdom.**—The Commons passed the Goods and Services (Price Control) bill.

June 29: **United Kingdom.**—Lord Beaverbrook was appointed minister of supply, Sir Andrew Duncan, president of the board of trade, and Mr. Oliver Lyttelton to special duties abroad.

July 1: **United Kingdom.**—The secretary for petroleum announced a reduction of one-sixth in the basic ration of petrol for private cars in the August, September and October period.

Australia.—Senator James Cunningham, deputy leader of the Labour opposition, was elected president of the senate.

July 2: **United Kingdom.**—It was disclosed that the first three weeks of June had provided the most extraordinary June weather on record. Only 11 days after the coldest June day for five years London experienced the hottest June day on record.

July 3: **Newfoundland.**—For the first time for many years the budget showed a surplus of income over expenditure. From the surplus it was decided to present $500,000 to Britain for a fighter aircraft squadron, to be manned by Newfoundlanders.

July 5: **Canada.**—To provide Britain with Canadian dollars, the government advanced £325,000,000 to the foreign exchange control board.

July 8: **United Kingdom.**—The final figure for the whole of the war weapons weeks in the national savings campaign was announced as £395,000,000.

Australia.—The air minister stated that expenditure on the Royal Australian air force in the current financial year would exceed £A.1,000,000 a week.

July 11: **Australia.**—Net war expenditure in the year ended June 30 was £A.169,857,000, which was £A.5,500,000 less than the estimate. Revenue for the year was £A.2,121,000 above the estimate. The income tax yield was more than double that of the previous year.

July 17: **New Zealand.**—The second war budget estimated the country's war expenditure at £69,700,000.

July 20; **United Kingdom.**—Government changes included the appointment of Mr. Duff Cooper, chancellor of the Duchy of Lancaster, to a special mission in the far east; of Mr. R. A. Butler as president of the board of education; of Mr. Brendan Bracken to be minister of information.

July 21: **India.**—Exchange of representatives between India and America having been agreed upon, Sir Girja

Shankar Bajpai was appointed the Indian representative, to be styled agent-general.

July 22: **Straits Settlements.**—Rumours of impending British action in Indo-China were denied in an official broadcast in English and French from Singapore.

India.—The secretary of state for India announced that the governor-general's executive council would be enlarged and a national defence council established.

July 27: **Canada.**—The minister for trade and commerce announced the conclusion of an agreement under which two-thirds of British Columbia's canned salmon for 1941, expected to amount to more than 1,000,000 cases, would be sent to Britain.

United Kingdom.—An important stage in the growth of Liverpool cathedral was reached when the old and new sections were used for the first time together. Removal of the temporary dividing wall revealed a vista of much grandeur.

India.—The second session of the conference of non-party leaders was opened at Poona by Sir Tej Bahadur Sapru, who reviewed events since the Bombay conference.

July 30: **India.**—Membership of National Congress showed a rapid decline under Mr. Gandhi's policy of non-violent pacifism in relation to the war. Before the outbreak of war members numbered some 4,500,000. In 1939–40 there were 3,000,000 and in 1941 the total was little over 1,500,000.

Aug. 7: **Eire.**—It was announced that sugar would be rationed on the basis of 1 lb. a week per person.

Aug. 10: **United Kingdom.**—Double summer time ended and clocks were put back one hour.

Aug. 11: **United Kingdom.**—Reclaimed land in East Sussex, some of which had been unproductive for centuries, would yield, it was stated, crops worth £85,000 in 1941.

Australia.—The conference of premiers decided to spend £A.1,000,000 on A.R.P. in vulnerable areas, half to be paid by the commonwealth, and £A.85,000 on supplementary measures, including anti-gas equipment.

United Kingdom.—Friendly Germans, Austrians and Italians in the country began to register for war work.

It was stated that savings stamps to the value of about £20,000,000 had been bought since the inception of the war savings campaign.

Aug. 13: **South Africa.**—At the Transvaal congress of the Herenigde party, summoned to consider the adoption of the federal council's declaration of policy, Dr. Malan, the leader, condemned Mr. Pirow's campaign for a "new order" based on National Socialism.

Aug. 14: **United Kingdom.**—Mr. Attlee announced in a broadcast that Mr. Churchill and President Roosevelt had met at sea and agreed on the eight-point "Atlantic charter" of peace aims.

Aug. 15: **United Kingdom.**—With a message to Sir Claud Auchinleck, the Queen opened the new airgraph letter service to forces in the middle east.

Aug. 20: **United Kingdom.**—Mr. Mackenzie King, Canadian premier, arrived in the country.

Aug. 22: **Jamaica.**—After a three days' debate the legislature rejected the proposals for a new constitution, and an amendment favouring full representative government was adopted by the legislative council.

Aug. 25: **Australia.**—Mr. Menzies's proposal for a national government was rejected by the Labour party, who demanded the resignation of his government.

India.—The premiers of the Punjab and of Assam resigned from the national defence council under pressure from the Moslem League.

Aug. 28: **United Kingdom.**—The minister of war transport announced a new financial agreement under which the government would make an annual payment of £43,000,000 to the four controlled railway companies and the London Passenger Transport Board.

Aug. 28: **Canada.**—Under a contract to become operative in October the government agreed to provide Britain with 600,000,000 lb. of bacon in a year.

Aug. 29: **Australia.**—Commissioned to form a new cabinet, following the resignation of Mr. Menzies on Aug. 28, Mr. Fadden announced that there would be for the present no changes in the ministry. Mr. Menzies would retain the portfolio of defence co-ordination.

Sept. 4: **Kenya.**—The compulsory registration of British European women between 18 and 60 for war work was announced.

Sept. 6: **United Kingdom.**—Details were announced of arrangements for the compulsory registration of men between 18 and 60 for fire guard duties.

Sept. 7: **United Kingdom.**—The first Sunday following the second anniversary of the war was observed as a national day of prayer.

Sept. 8: **Canada.**—Production of motor cars for sale in 1942 was reduced by an order in council to 44 per cent of the 1940 figure.

Sept. 10: **India.**—Mr. Fazlul Huq, premier of Bengal, resigned from the defence council and from the working committee and council of the Moslem League in protest against Mr. Jinnah's attitude to participation in the viceroy's defence council.

New Zealand.—Mr. Nash, acting premier, announced in parliament that the King had approved of the designation of the New Zealand naval forces as the "Royal New Zealand Navy."

Sept. 12: **United Kingdom.**—A political warfare committee, responsible to the foreign secretary and the ministers of information and economic warfare, was set up.

Sept. 14: **Canada.**—Roman Catholics and Protestants alike observed a reconsecration week throughout the country.

United Kingdom.—Details of the reorganization of the fire fighting services as a national fire service, brought secretly into operation on Aug. 18, were disclosed. The scheme involved the reconstitution of 1,400 fire brigades as 33 fire forces conducted on an entirely new system.

Sept. 15: **India.**—The voluntary conversion of the Territorial force into regular units became effective, and it was stated that more than 75 per cent of the Territorials had volunteered for full military service.

Sept. 17: **United Kingdom.**—The National Trust for Scotland announced that the famous falls of Glomach in Ross-shire were to be handed over to their custody.

Sept. 18: **United Kingdom.**—The result of 21 months' salvage collection by those local authorities which made returns to the salvage department of the ministry of supply was stated to be a total of 1,550,000 tons of waste material, which was resold to industry for £3,700,000.

Sept. 24: **Sarawak.**—On the centenary of the state, the new constitution was approved.

Sept. 25: **Australia.**—Mr. Fadden agreed to the appointment of a royal commission of inquiry into the allegations against the government regarding the use of "secret funds" for counter-propaganda against subversive elements.

New tax measures to meet a proposed expenditure of £A.217,000,000 for war purposes were outlined by the prime minister in the new budget.

Oct. 3: **United Kingdom.**—Col. J. J. Llewellin, joint parliamentary secretary to the ministry of war transport, stated that in the second year of war 10,073 people had been killed on the roads, against a pre-war average of 6,500 deaths a year.

Australia.—A vote of censure on the government on the budget was carried by 36 votes to 33. On Mr. Fadden's resignation Mr. Curtin undertook to form a new government.

The royal commission investigating the alleged use of public money for activities of the Australian Democratic front opened its inquiries.

Oct. 6: **United Kingdom.**—The total raised in small savings since the inauguration of the national savings campaign in November 1939 passed the £1,000,000,000 mark.

Australia.—Mr. Curtin announced his new Labour administration in which he himself took over the portfolio of defence co-ordination.

India.—The first meeting of the new national defence council was opened by the viceroy.

Northern Rhodesia and Kenya.—Reconstruction of the Great North Road between Northern Rhodesia and Kenya to an all-weather standard at a cost of £355,000 was decided upon by the war office.

Oct. 7: **United Kingdom.**—The secretary for war announced in parliament that last minute demands by the German government had caused the cancellation of plans for the exchange with Germany of sick and wounded prisoners of war.

Australia.—A bill authorizing a loan of £A.50,000,000 was passed in parliament.

Mr. Fadden was elected opposition leader by the United Australia and Country parties.

Oct. 13: **Straits Settlements.**—At the budget meeting of the legislative council a revenue of 59,700,000 Straits dollars was estimated for 1942, against an expenditure of $58,200,000.

Oct. 14: **Canada.**—The national income was stated to have reached a higher level than ever known in dominion history. At $3,446,000,000 in the first eight months of 1941 it showed an increase of 10·5 per cent over the same period in 1940.

India.—Census returns for 1941 showed that the total population was 388,800,000.

Oct. 15: **New Zealand.**—It was decided to postpone the general election to avoid disruption of national unity in the war effort, and a bill extending the life of

parliament to Nov. 1, 1942, was passed without a division.

Oct. 16: **United Kingdom.**—The appeal to the House of Lords by Antonio Mancini against his conviction for murder was dismissed. Mancini had appealed on a point of law against the refusal by the Court of Criminal Appeal to quash the conviction of the Central Criminal Court.

Australia.—The establishment of a Japanese air line to Timor was stigmatized in the press as a provocative act.

Oct. 17: **Australia.**—The government undertook to send £1,000,000 worth of railway stock to Iran.

India.—In spite of war-time difficulties the British India office announced that arrangements had been made to transport Moslem pilgrims from India to perform the Haj in Arabia.

Oct. 18: **Canada.**—Mr. Mackenzie King announced the government's decision to give the Wartime Prices Trade Board authority for price control of all commodities except goods for export, and of rent and services. To control wages and regulate industrial relations a national labour relations board would be set up.

Oct. 21: **United Kingdom.**—An increase in the government grant for free school meals was announced.

Oct. 23: **South Africa.**—General Hertzog's advocacy of National Socialism ended a political association of more than 40 years with Mr. Havenga, leader of the Afrikaner party, who insisted on maintaining the democratic basis of the party.

Oct. 28: **India.**—A boycott of the new session of the central legislature was begun by the Moslem League party.

Oct. 29: **United Kingdom.**—Sir Earle Page, Australia's special representative, arrived in London.

Australia.—A budget superseding that of Sept. 25 during Mr. Fadden's administration was introduced by the treasurer and showed total expenditure as £324,965,000 (compared with £319,306,000 estimated in the previous budget), of which £221,485,000 represented war appropriation. Income tax on incomes over £2,500 was raised to 16*s.* 8*d.* in the pound.

Nov. 1: **United Kingdom.**—The historic estate of Wallington in the Middle Marches of Northumberland, comprising over 13,000 acres of farms and moorlands, was given to the National Trust by Sir Charles Trevelyan.

Nov. 2: **Hong Kong.**—The government protested to the Japanese government against a violation of the border on Oct. 29 when Japanese soldiers fired on Chinese inside Hong Kong territory.

Nov. 3: **United Kingdom.**—U Saw, premier of Burma, who arrived in England on Oct. 10 on a mission from his country, expressed dissatisfaction with the results of his visit.

Australia.—Sir Earle Page, the government's special representative to Britain, stated in London that Australia was fully capable of defending itself and taking part in the wider strategy that would be involved by war in the Pacific.

Nov. 6: **United Kingdom.**—Sir Walter Monckton was appointed head of the propaganda and information services in the middle east under the minister of state (Mr. Oliver Lyttelton).

Canada.—The minister of munitions announced an expansion of the shipbuilding programme, and new facilities for ship repairing were estimated to cost $4,500,000.

Nov. 11: **The Empire.**—Following observances of Remembrance Sunday on Nov. 9, when in England Flanders poppies covered the Empire field of remembrance outside Westminster Abbey, Armistice day was commemorated throughout the Empire. In Australia the anniversary was marked by the opening of the national war memorial by Lord Gowrie.

United Kingdom.—Eight people were shot, three fatally, in a remarkable shooting affair in west London for which a man was later arrested.

Nov. 12: **Canada.**—Senator Arthur Meighen accepted the leadership of the Conservative party.

Nov. 13: **United Kingdom.**—First details were released of the Avro-Manchester twin-engine bomber, disclosing a defensive armament of eight machine guns.

India.—Mr. Gandhi stated that so far as he knew the Congress party would neither appreciate nor respond to any gesture the government might make in releasing the Satyagraha prisoners. Invitations would be extended to those discharged to offer themselves again for civil disobedience if physically fit.

Nov. 17: **United Kingdom.**—Temporary increases were made in the domestic fat and sugar ration.

Nov. 18: **United Kingdom.**—A token stoppage of work by Clydeside shipyard workers in opposition to their trade union executive was organized to draw attention to demands for a 10*s.* a week wages advance.

Sir John Dill was created a field-marshal and appointed governor-designate of Bombay.

Nov. 21: **India.**—Mr. Thomas M. Wilson, first U.S. commissioner to India, presented his credentials to the viceroy.

Nov. 23: **United Kingdom.**—Under the new milk distribution scheme adult consumers were entitled to receive not more than two pints of fresh milk weekly.

Nov. 27: **Australia.**—The findings of Mr. Justice Halse-Rogers, reporting as royal commissioner investigating the use of "secret funds," were published.

Nov. 29: **United Kingdom.**—In the second year of the war savings campaign which ended on Nov. 21 £633,262,731 was contributed in small savings, compared with £484,043,375 in the previous year.

Dec. 1: **United Kingdom.**—Canned meats, fish and beans were rationed under a points system.

Malaya.—A state of emergency was declared throughout the Malay States and the Straits Settlements.

Dec. 3: **India.**—Civil disobedience prisoners released by the government included Maulana Abdul Kalam Azad and Jawaharlal Nehru.

Dec. 4: **United Kingdom.**—A parliamentary motion introduced by Mr. Churchill and embodying proposals for further mobilization of man- and woman-power "to achieve the maximum national effort" was passed in the Commons.

Dec. 5: **Australia.**—Army leave was cancelled and emergency measures in the Pacific were put into effect.

Dec. 7: **The War.**—Britain declared war on Finland, Hungary and Rumania, and similar declarations followed from the Empire.

Dec. 8: **The War.**—Britain declared war on Japan.

Dec. 11: **Australia.**—Emergency measures announced by Mr. Curtin included the call-up of single men of 35 to 45 and married men of 18 to 35.

India.—The arrest was announced of Sarat Chandra Bose, owing to his contacts with the Japanese.

Dec. 13: **New Zealand.**—Under new petrol restrictions no petrol was allowed for pleasure, and all motor deliveries and passenger services were reduced.

Dec. 16: **United Kingdom.**—The chancellor of the exchequer stated that recent expenditure had risen to nearly £83,000,000 a week. Total expenditure on the war had reached £8,300,000,000.

Australia.—New taxation, supplementing the October budget aimed at raising £16,000,000. It included a war-time levy on all incomes and an increase in company tax.

Dec. 18: **United Kingdom.**—The Duchess of Gloucester gave birth to a son, her first child.

Dec. 19: **United Kingdom.**—The King signed a proclamation making women from 20 to 30 liable to call-up under the National Service Act which became law on Dec. 18.

Straits Settlements.—Mr. Duff Cooper, already in Singapore, was appointed resident minister at Singapore for far eastern affairs.

Dec. 21: **United Kingdom.**—Peerages were conferred on four members of the Labour party.

Dec. 23: **United Kingdom.**—It was disclosed that Mr. Churchill was in the U.S. to discuss with the President full Allied co-ordination.

Dec. 25: **United Kingdom.**—The King's Christmas day message to his people was broadcast throughout the world.

Dec. 27: **The War.**—A state of war with Bulgaria as from Dec. 13 was announced in Britain.

Dec. 28: **Malaya.**—Registration began of all civilians in Singapore, and a Chinese council was formed to mobilize the resources of the Chinese communities.

Dec. 30: **Canada.**—Mr. Churchill addressed both houses of parliament.

India.—Mr. Gandhi resigned his leadership of the Congress party.

Malaya.—Martial law was proclaimed for the settlement of Singapore.

Dec. 31: **United Kingdom.**—Rembrandt's portrait of Margaretha Trip, from the collection of Lord Crawford and Balcarres, was bought for the nation at a cost of £20,000.

SUPPLEMENT

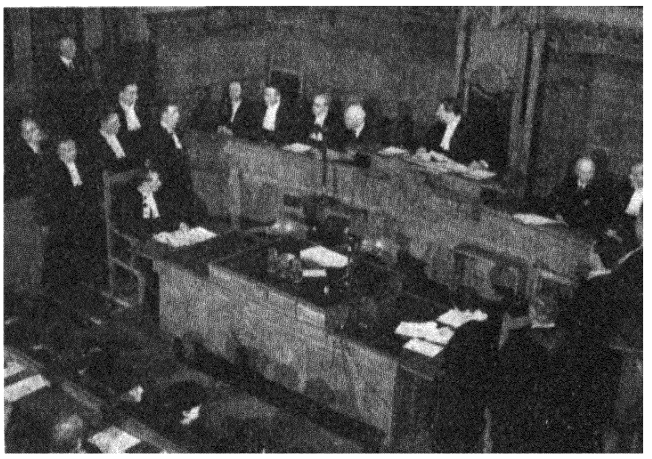
EMERGENCY LEGISLATION. The chief characteristics of emergency legislation during 1941 were, first, a steadily increasing demand by the state for personal services of members of the community and, secondly, greater stringency of provisions against economic waste and unfair distribution of commodities. Mobilization of citizens and national resources for the successful prosecution of the war is the key-note of both these aims. The first of them was evidenced not only by the extension of the ages of conscription for military service for both youths and adults but also in making compulsory the performance of certain civil duties connected with the war (e.g., fire-watching) and in requiring women between certain ages to register for national service. Proofs of the second aim appear both in Acts of Parliament and in a multitude of statutory rules and orders issued by government departments acting under statutory authority. A mere glance at the topics with which these orders deal shows the extent to which individual freedom of action has been subordinated to the needs of the war. Various restrictions were placed on dealings in specified commodities, e.g., confectionery, apples, lard, coal, petrol, bulbs, seeds, rabbits, and departmental legislation affected such diverse subjects as dock-labour, the load-line of ships and the permission to public vehicles to take a certain number of standing passengers. This article is necessarily limited to a brief notice of the more important statutes passed in 1941.

The *National Service Act* (4 & 5 Geo. VI, c. 16) extended conscription to the Civil Defence Services because it was found that, in some areas, the personnel of bodies like the Auxiliary Fire Service and the First Aid Associations would be insufficient to cope with enemy action. The Act by no means abandons the voluntary system here, but reinforces it by giving men, who are liable to be called up for military service, the opportunity of choosing service in civil defence, subject to vacancies being available and to the prior claims of the armed forces of the Crown. A person accepted in this way for civil defence becomes a servant of the Crown.

The intensification of enemy air attacks during 1940 and the earlier months of 1941 showed that, admirable as were the courage and skill of members of the fire-fighting service, there were serious defects in the organization of the system under which they worked. There was too much localization of it and the senior fire officers had not enough executive authority. The *Fire Services (Emergency Provisions) Act* (4 & 5 Geo. VI, c. 22) reformed this by enabling the Secretary of State to make regulations for the co-ordination of all or any of the fire services provided by local authorities, or for the unification in whole or in part of any of those services, and for any other matters which appear to him to be necessary or expedient for improving existing arrangements for fighting fires.

Probably no statute was of more general interest than the *War Damage Act* (4 & 5 Geo. VI, c. 12) which became law on March 26, 1941. Broadly, its purpose is to provide state-aided compensation for damage to certain kinds of property directly resulting from enemy action, from counter-measures against enemy action, or from precautionary measures against it. Naturally, injury due to air raids is the commonest form of such damage, but it is not the only instance. The Act applies to England, Wales, Scotland and Northern Ireland. Part I of it deals with damage to land and this includes buildings and other immovables. The proprietor of the land must pay a contribution which is in effect a new tax on land. There are special provisions relating to land that is mortgaged or leased. The period of risk covered by Part I was from September 3, 1939, to August 21, 1941, but a later Act extended it to August 31, 1942 (4 & 5 Geo. VI, c. 37). Part II of the Act relates to insurance of goods against war damage. The Board of Trade are to insure goods in the ownership or possession of persons carrying on business. Under the War Risks Insurance Act, 1939, they insure sellers or suppliers of goods in respect of their stocks. Part II of the Act of 1941 enables the board also to issue insurance policies on private goods, such as household furniture and other personal property owned or possessed by the insurer, or by members of his household ordinarily resident with him, or by his domestic servants. The Act is necessarily experimental. Some amendments of it have already been made by 4 & 5 Geo. VI, c. 37, and, like most emergency legislation, much of its working must depend on its adaptation to circumstances by statutory rules and orders made in pursuance of it. Nevertheless, both it and the Personal Injuries (Civilian) Scheme, 1940, which was noted in this article last year and which provides compensation for injuries sustained by civilians in consequence of the war, constitute a wise and courageous acceptance of responsibility by the state for alleviating the disasters that are incident to the civil population in modern warfare. Other and later statutes relating to the same topic are the *Repair of War Damage Act* (4 & 5 Geo. VI, c. 34) and the *Landlord and Tenant (War Damage) (Amendment) Act* (4 & 5 Geo. VI, c. 41). The former amended earlier legislation as to the powers of local authorities to repair buildings rendered unfit for housing purposes by war damage and as to state loans to these authorities for giving effect to their powers. The latter amended the principal Act passed in 1939, which dealt with the problems arising between the landlord and tenant of premises injured by war damage, and in particular enabled the tenant to disclaim the lease. The chief point in the amending Act is that it excepts from disclaimer short tenancies, which are defined in effect as those determinable on three months' notice; but it also frees the tenant from liability to pay rent if the premises are unoccupied and, if they are occupied, it allows him to apply to the court for adjustment of the rent payable, if he and the landlord cannot agree on the amount by which it shall be reduced.

Among the statutes concerning constitutional law, the following must be noticed. Since the time of Queen Anne it has been law that acceptance of an office or place of profit under the Crown shall disqualify the holder for a seat in the House of Commons. There were many exceptions to this rule (e.g. commissions in the armed forces of the Crown) and several more had been added since the outbreak of war. But its exigencies demanded freer and prompter action in increasing the exceptions and this was created by the *House of Commons Disqualification (Temporary Provisions) Act* (4 & 5 Geo. VI, c. 8). It enabled the First Lord of the Treasury (i.e., the Prime Minister) to certify that the appointment of any member of parliament to any office under the Crown is required in the public interest for purposes connected with the prosecution of the war. Such certificate must be laid before the House of Commons and the disqualification of office then does not apply to the member's tenure of his seat. The Act was not passed without a good deal of criticism in the House itself, on the



British Council]

FOREIGN LAW COURTS IN LONDON. THE NETHERLANDS MARITIME HIGH COURT IN SESSION AT THE MIDDLESEX GUILDHALL

ground that it seriously invaded the principle of the independence of the legislature from the executive, and a committee of the House appointed to consider the whole question issued its report at the end of 1941. Two other statutes originated in problems raised by the migration of members of allied governments to England in consequence of the war. Diplomatic privileges were conferred on them by the *Diplomatic Privileges (Extension) Act* (4 & 5 Geo. VI, c. 7). Much more remarkable is the *Allied Powers (Maritime Courts) Act* (4 & 5 Geo. VI, c. 21), which made a new departure by enabling His Majesty by Order in Council to permit any allied power to set up maritime courts with criminal jurisdiction in the United Kingdom. The jurisdiction is limited to offences committed by persons (other than British subjects) on board a merchant ship of the power concerned, or by the master or any member of the crew against the merchant shipping law of the power, or by any person, who is a national and a seaman of the power, against its mercantile marine conscription law. Provisions are made for the co-operation of the British executive authorities in bringing such persons to trial by the maritime courts and in compelling the attendance of witnesses. Norwegian, Dutch and Polish courts have already been set up under this Act. Another constitutional innovation was the *Isle of Man (Detention) Act* (4 & 5 Geo. VI, c. 16) which enables the government to detain in the Isle of Man non-enemy aliens and persons in confinement under the Defence Regulations. The Act was necessary, because technically the Isle of Man is not part of the United Kingdom and, apart from the statute, it would be unlawful to transport there British subjects or non-enemy aliens.

The Prices of Goods Act, 1939, provided safeguards against the " vicious spiral " of inflated prices and depreciation in the value of money by fixing basic prices for such goods as the Board of Trade should from time to time specify. The Act was not altogether effective and was amended by the *Goods and Services (Price Control) Act*, 1941 (4 & 5 Geo. VI, c. 31), which was designed to put a stop to " black markets " in commodities in common demand. Any person commits a criminal offence if he holds up the sale of stocks of goods which are subject to price-control. Holding up includes not only refusal to sell the goods but also false statements to a prospective buyer that the trader has not the goods. It extends also to offers to sell the goods subject to a condition that the buyer shall purchase other goods (whether price-controlled or not); indeed, no condition is permissible except that the buyer shall pay the price forthwith or that he shall take delivery within a reasonable time. The Act also empowers the Board of Trade to fix maximum charges for services to goods; " service " here signifies hiring goods or subjecting them to any process. Further, the board is enabled to regulate the sale of any class of second-hand goods in which it has reason to think that profiteering is taking place.

A considerable number of people have been plunged in financial difficulties by the war. Earlier emergency statutes had given them some relief, but the *Liabilities (War-time Adjustment) Act* (4 & 5 Geo. VI, c. 24) goes so far beyond prior legislation that it has been styled the " debtor's charter." " Debtor " under the Act includes, as well as individuals, partnership firms and private companies, but not other corporations. The Act does what none of the earlier statutes attempted to do; it enables a debtor to get, not simply temporary relief, but a settlement of his affairs with the prospect of continuing or renewing his business in better times; and he can achieve this without the disgrace of bankruptcy, although much of the procedure resembles bankruptcy procedure. The settlement is effected by a newly created body of officials called " liabilities adjustment officers."

The *Finance Act* (4 & 5 Geo. VI, c. 30) continued the principle of its predecessors with respect to taxation during the war, which is to restrain the expenditure of money on things the supply of which is not equal to demand. The most conspicuous feature of the Act was its increase of income tax from 8*s.* 6*d.* to 10*s.* in pound (*see* INCOME TAX; WAR FINANCE).

AUTHORITIES.—Primary sources are the Statutes and Statutory Rules and Orders published by the government; but these are not easily accessible as a whole to most readers. The best collection is *Butterworths Emergency Legislation Service Annotated*. It deals separately with (1) Statutes; (2) Regulations and Service, and both are kept up to date by the issue of supplements. (P. H. W.)

Dominions and India. Legislation has been passed in the dominions complementary to that enacted at Westminster since the declaration of war.

Canada.—The first act of the Canadian parliament in 1940 was an amendment of the National Defence Act of the war of 1914–18 which was repealed towards the end of the session by another Act (c. 21) authorizing the appointment of a minister of national defence with such additional ministers for the army, navy and air force as might be found necessary. A more comprehensive measure (c. 13) conferred upon the governor in council special emergency powers to permit the mobilization of all the effective resources of the nation, both human and material, for the purpose of the defence and security of the dominion. By orders and regulations made under the Act he may do anything " deemed necessary or expedient for securing the public safety, the defence of Canada, the maintenance of public order, or the efficient prosecution of the war." In order to carry out the provisions of this Act, the department for national war services was created (c. 22) with a separate minister entrusted with the duty to conduct a national registration of personal services and a survey of material contributions for the prosecution of the war and the welfare of the nation. In order to secure a united effort he was authorized to establish such provincial or local councils as might be necessary while enlisting and using to the full existing organizations able to assist in

carrying out the purposes of the Act. While looking to the provinces for co-operation in this respect the dominion at the same time took reciprocal action to mitigate the effects of war conditions in the provinces. Accordingly an Act (c. 23) was passed to provide for some contribution by the dominion, where circumstances warrant, to supplement the measures taken by the provinces towards providing assistance to those in need, establishing unemployed persons in employment, and training and fitting suitable persons for productive occupations, thereby lessening provincial and municipal burdens in so far as they might be due to extraordinary conditions of unemployment previously existing, and at the same time developing the economic capacity of the nation to carry on the war.

While willing to aid in furthering the national effort, the government made it clear that they had no intention of using this or any other legislation to relieve municipalities of their own obligations incurred to bondholders or of the sound administration of their own finances.

The growth of the Royal Canadian Air Force required new legislation (c. 15) to define the constitution and government. It carries the legislation of the United Kingdom relating to the air force into the dominion, subject to the usual provision that it is not inconsistent with anything contained in the Canadian Act.

Another piece of legislation of the Great War requiring extension was the War Measures Act (R.S.C., c. 27). Provisions relating to compensation for the valuing of certain property for war purposes are now contained in c. 28 of 1940 dealing with requisition of vessels or aircraft and space in ships.

The Act of 1939 creating a department of munition and supply was amended in the following year (c. 31) so as to extend the powers of the minister, including the creation of a body corporate by charter to undertake the actual supply of the munitions of war and the direction of any firms providing them.

The necessity for protection against the enemy within the gates found expression in the passing of the Treachery Act (c. 43) which expedited the procedure so as to avoid delay in dealing with accused persons and laid down measures for the transfer of offenders under the direction of the attorney general from the civil to the military authorities.

The division of powers between the dominion and provincial legislatures required legislation to be passed by the latter, as, for example, Acts in Alberta (1940, c. 4) and Saskatchewan (1940, c. 109) giving powers similar to those contained in the English Courts Emergency Powers Act, by which men on active service could be relieved from obligations, including exemption of their house property from assessment and taxation. The Saskatchewan Act provides an example of the extensions which have been found necessary to legislation of this kind. In the original Act relief was limited to estates assessed at an amount not exceeding $2,500. By an Act of 1941 (c. 87) relief up to that amount was extended to estates of any value.

The warmth of the hospitality of the dominions towards the scheme for sending children from Great Britain to their care found expression in legislation. Ontario, for example, assented on April 9, 1941, to the *British Child Guests Act* (c. 9) which made the superintendent of neglected and dependent children the guardian of any infant entering the province after Sept. 1, 1939, from Great Britain and Northern Ireland. He was given power to consent to a surgical operation, medical care and hospital treatment in any case where the consent of a parent or legal guardian is required and could direct that if necessary any child might be taken from the home where it resides and be placed in a foster home approved by a children's aid society. The Act does not apply to any child living with or subject to the control of either or both parents residing in Canada.

Parliamentary time has been much occupied with the measures necessary to deal with the financial requirements of the war. Details are beyond the scope of this survey, but broadly speaking it may be said that the main principles adopted in the United Kingdom were followed in the dominions.

Australia was particularly occupied with a number of financial measures during the session of 1940 which had a particularly large output of legislation. Similarly the states had to devote time to financial legislation though it was not wholly concerned with internal affairs. A *Tasmania Act* (No. 37 of 1940–41), for example, enables statutory bodies to contribute up to one per cent or £100, whichever is the greater, to any fund raised within the British dominions for the relief of victims of enemy air raids or any other patriotic purpose which the governor may approve.

In 1941 the first Commonwealth Act extended the long series of measures dating back to 1918, which deal with the provision of homes for men of the services. No. 2 required the employer to deduct the defence tax from the wages of the workman, and this by No. 3 was fixed at two and a half per cent. The Defence Acts were strengthened by No. 4 and the position of civil servants on active service protected by No. 5.

For the more efficient conduct of the war an Act (No. 24) increased the number of ministers of state in order to provide special ministerial responsibility for aircraft production, civil defence, including air-raid precautions, and the problem of the organization of civil resources. During the war of 1914 to 1918 the amount appropriated for the salaries of ministers of state was increased from £13,600 to £15,300, and this figure has now been raised from £18,000 to £21,250.

Indirectly as a result of war-time conditions, it was necessary to increase the endowment for children to five shillings for each child, payable to the mother for the "maintenance, training and advancement of the child." Another measure (No. 26) of a similar character constituted a commonwealth council for national fitness "to encourage the development of national fitness in each state under the direction of a national fitness council appointed by the government of the state . . . to promote physical education in schools, universities, and other institutions."

New Zealand was also engaged during 1940 in passing legislation to deal with finance, including a measure specially devoted to national savings which elsewhere have been authorized in the Finance Acts. The governor general was given (c. 1) similar powers to those exercised in Great Britain, Canada and Australia as required by the emergency to deal with compensation for property, treatment of aliens, etc. Faithful to its settled policy, New Zealand continued its endeavours to establish social security for the people, and by amendment (1941, No. 14) of the Social Security Act took a further step in the attempts to provide medical benefits. The funds have been supplied (1941, No. 4) to extend family allowances to mothers with one child instead of, as formerly, to those with three or more children. The government established (1941, No. 17)

a war damage commission operating on similar lines to the English arrangements. The *Rehabilitation Act* (1941, No. 25) covered the subject of post-war reconstruction by dealing with the re-establishment of " service men " (which includes men of the mercantile marine) in civil life, and industrial reconstruction, which is primarily concerned with the transfer to peace-time industries of persons who have been engaged in war work.

South Africa.—The legislation of South Africa shows participation in the empire conflict. The general provisions for the protection of the community are contained in the War Measures Act (1940, No. 13) dealing with the maintenance of public order and the prosecution of the war, and principally consist of the validation of proclamations already in operation. In the middle of 1940 an Act (No. 29) was passed to provide for the payment of benefits to men who had sustained injury and the dependents of those killed in action, for payments in certain circumstances to members of the Essential Services Protection Corps and others on their retirement and to the dependents on death, and for a moratorium for the protection of persons on military service. Special provision was made for clerks articled to attorneys that the period of active service might exempt them from part or the whole of their period of articles. The conditions under which absent military voters are entitled to record their votes were embodied in an Act of 1941 (No. 37). Provisions for pensions for men on active service dating back to the Boer War were extended by No. 45 of 1941. State insurance against war damage was authorized by c. 21.

South Africa also paid attention to the social security of its people, and passed a comprehensive measure for the control of factories and workshops (1941, No. 22) giving annual holidays with pay and increasing the maternity benefit for women in industry. A consolidation and extension of the law relating to workmen's compensation (No. 30) was another measure of the session. It established a state insurance fund similar to those in operation in Canada and Queensland where conditions are more comparable to those of South Africa.

India.—After providing for the registration of British subjects (No. 1) at the beginning of 1940, the Indian legislature proceeded to impose restrictions on foreigners (No. 2) by making provision for their entry, their internment, and their departure. Extension of service in the Royal Indian Navy for the duration of the war was authorized by Act No. 3 and provisions relating to national service by European British subjects whether in the armed forces or in a civil capacity were contained in No. 18, amended in 1941 (No. 6) by providing for the determination of the question whether a person is liable to be called up for national service. Minor amendments (Nos. 19 and 28) were made in 1940 in previous defence measures. Companies were authorized by No. 37 to make donations to public funds formed, and to make investments in government loans floated for the purpose of assisting the prosecution of the war.

The constitution of an air-raid precaution service was authorized by No. 4 of 1941, and rendered any persons failing to obey lawful orders liable to a fine not exceeding fifty rupees. Compensation for injuries during the present hostilities was authorized by the War Injuries Ordinance (No. vii), and included the purchase or grant of cost of artificial limbs or appliances.

AUTHORITIES.—Primary sources are the Acts and Ordinances passed by the various legislatures and issued by the government printers. Particulars above are also taken from a summary supplied by the law draftsman, J. Christie, for the annual survey of legislation of the empire published by the Society of Comparative Legislation. Useful information about legislative measures in their passage through parliament is obtainable in the *Journal of the Parliaments of the Empire* published by the Empire Parliamentary Association. (C. E. A. B.)

FOOD SUPPLY AND NUTRITION PROBLEMS.

The claim has been frequently made in official quarters that Great Britain was the best fed nation among the belligerents in Europe and was the only nation which had been able to increase its rations in the third year of the war. While this may be true it is undoubted that the diet of the nation did not reach a standard which dietitians demand. It is likely that there was still a grave deficiency in calcium, iron and possibly of vitamins of class B. The consumption of vitamin C had probably declined.

Rationing during 1941 was in much the position that it was in 1940. Bread was unrationed but its price was controlled. The government-rationed foods were meat, butter, margarine, cooking fats, cheese, sugar, jam, tea and eggs. Milk was rationed more by supply and price than by government action. Fruits, which were almost entirely home grown, were rationed by scarcity and their price was controlled. Vegetables were fairly plentiful though their price was often above that of peace time. Canned meats were controlled by a points rationing scheme. While the government, quite rightly, attempted to safeguard the diet of pregnant and nursing mothers and their children up to the age of five, no precautions had been taken to feed adolescents or young working women adequately. The diet of the child on leaving school and entering trade often depreciated because at school there was an opportunity—unfortunately lessening owing to shortage of obtaining cheap milk. Out in the world the adolescent needs more and better food than he gets while at school and the probability is that he was getting less and worse. Significantly among women between the ages of 20 and 30 the tuberculosis rate had increased and, generally speaking, the decline of tuberculosis—a feature of health statistics for many years—had been arrested. These facts are doubtless in part due to inadequate nutrition.

Judging by health statistics the feeding of the nation must have been satisfactory, if not optimal, and the ministries of food, health and agriculture could congratulate themselves on that achievement. It is clear from reports from the ministry of health that there existed a widespread fear of epidemic diseases comparable to the waves of influenza which swept the globe in 1918 and 1919, but these, up to the first months of 1942, had fortunately been absent. One explanation may well be that the large part of the population which had entered the army and war work was fed better than ever before; that mothers and young children of the working classes had had cheap or free milk and that unemployment had decreased from a figure of over a million to one measured by one or two hundred thousand. Those who were rationed by poverty in the past and not by government were finding themselves able to purchase food up to their rations.

Bread. The situation as regards bread was much where it was in 1940. The average dietitian pressed on the government the advantage of a wheatmeal bread fortified by calcium. Many would have liked to see such a bread made compulsory. There were other reasons, not dietetic, for the change over. Shipping space would have been

saved, for example, and although such a change might have resulted in a decrease of milk, pork and eggs (for the offal of wheat goes to feed cows, pigs and hens) there would have been a gain on balance of iron and vitamins of class B in diet.

In this situation the government havered. It promised a white loaf fortified with synthetic vitamin B_1, but although it was said that this should be introduced in May 1941, only a few districts—e.g., South Wales—had been provided with such fortified bread by the end of 1941. A promise was given that early in 1942 areas in the north-west would be included. Whether obstacles to the plan lay in the milling and baking industries or the manufacture of synthetic vitamin B_1, or elsewhere, is not known.

As regards a wheatmeal loaf the government itself widely advertised an 85 per cent extraction flour and bread made from it. But despite the advertisement only 7 per cent of the bread consumption was represented by this wheatmeal bread, which resulted in a negligible gain in shipping space and but little gain in dietetics. The reason given was that the people do not take readily to brown bread. The ministry of food never hoped for a conversion of more than 25 per cent of the white bread eaters to brown bread. (The army was expected to consume half and half.) The game seems hardly worth the candle. There could be little doubt that the temper of the country was such that if it could have been shown that a consumption of nothing but 85 per cent extracted wheat was a military necessity such a loaf would willingly have been accepted. That it is dietetically desirable had made no impression, due to the lack of education of the people in dietetics.

There is one dietetic disadvantage in a change from white to wheatmeal bread; that is the fact, now definitely demonstrated, though the work was still unpublished in early 1942, that such a change would lower the calcium uptake from our diet. That uptake is often dangerously low and would be made lower still. The phytates in wheatmeal flour militate against calcium absorption. They sterilize not only the small amount of calcium of the wheatmeal but in addition some of that of the rest of the diet. To counteract this action the committees of nutrition of the Lister Institute and the Medical Research Institute recommended the addition of 14 oz. of calcium carbonate to a sack of wheatmeal flour, and to safeguard the calcium uptake of the eaters of white bread an addition of 7 oz. to the sack of white flour. No steps appeared to have been taken to implement these sound suggestions. What difficulty stood in the way was not known. It could not be due to the public and it was suggested that it was due to the opposition of the milling industry. Even in the production of unfortified wheatmeal, looseness in the drafting of a statutory order was such that a mixture of white flour and bran met the ministry of food's demand for an 85 per cent extraction flour. Supplementary but not compulsory instructions which would have resulted in an 85 per cent extraction were obeyed by smaller firms but disregarded by some of the larger firms. The future will almost certainly lie with a bread enriched by addition of vitamins of the B class, iron and calcium.

Onions. Some other experiments of the ministry of food may be mentioned. In 1940 the onion crop was good but owing to the loss of imports from foreign countries was equivalent to only a small percentage of the national consumption. Consequently the price of onions threatened to soar. The ministry of food stepped in and fixed

Keystone

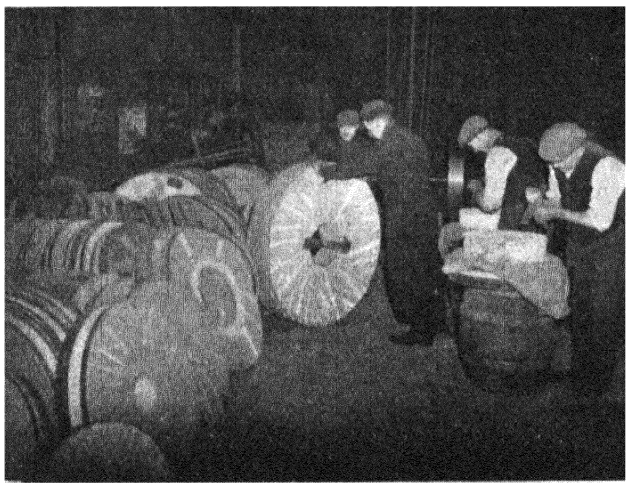
WHEATFIELDS ON THE SUSSEX DOWNS. THIS LAND WAS FORMERLY DERELICT AND HAD REVERTED TO GORSE, BRAMBLES AND ROUGH GRASS

a price and promptly onions disappeared off the market. The price of spring onions was not controlled. In the spring of 1941 onions in their second youth were offered as spring onions and the ministry stepped in again with a definition of a spring onion. Another consequence of the price-control of onions was the rise in the price of leeks, which touched 10*d.* each in the open market.

The ministries of food and agriculture proposed not to be caught again and made arrangements for a great increase in the acreage laid down to grow onions, and people were asked to register for the purchase of onions. Many when they discovered that they would get only 2 lb. *in the year*, refused to register, with the result that it appeared as if each registered person might get 12 lb.—an amount not to be despised. But the English climate stepped in. The onion crop was poor and the bulbs formed were often of the bottle-neck variety which do not keep. The hopes of the registered person fell to 2 lb. again and it became doubtful whether he would get one.

Vitamin C Supplies. When oranges disappeared, owing to shipping shortage, the infant welfare clinics had no obvious source of vitamin C for the babies. Swede juice, made by mincing, gently cooking and squeezing the pulp through muslin, would have done, but the clinics preferred black currant purée. In 1941 the government commandeered the black currant crop and fruit canneries in the black currant season made black currant pulp on government instructions and sent it to a central assembly place, where it was pooled, standardized and made into juice or into purée according to the age of the baby for whom it was intended. Again the vagaries of the English climate intervened. The vitamin C figure of the 1941 crop of black currants was the lowest known and created the greatest difficulty in producing an article with a reasonable content.

Rose hips, the richest common source of vitamin C, were also collected and syrup made from them was to be placed on sale early in 1942. It is interesting to note that the



The Times]

A WEST OF ENGLAND FACTORY WHERE MILLSTONES, SUCH AS ARE USED FOR THE GRINDING OF WHEATMEAL, ARE MADE. MILLSTONES ARE EXPORTED TO MANY PARTS OF THE EMPIRE

further north the greater was the amount of vitamin C in the hips. Presumably it is due to some varietal reason—it can hardly be a dispensation of providence—and this needs investigation. The Russians have long known and used rose hips in countering scurvy and have made, through their means and others, the colonization of the Arctic Circle a possibility.

Conclusions. On the whole the rationing system had worked well. The attempts of the ministry to safeguard the physical welfare of the young and their mothers were laudable and efficacious, and while their incursions into the control and sale of eggs and onions were less fortunate, their handling of the food situation was good and well-meaning if timid, especially, it has been suggested, in its relations with vested interests. If there is one thing which is certain it is that the feeding of a country, either in peace or war, can never be satisfactory till the agricultural policy of the country is subordinate to the demands of the ministry of food and these, in turn, subordinated to those of the ministry of health.

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MAN POWER, CONTROL AND USE OF. Control of man power in war-time arises from a number of reasons. First and most important is the scarcity of labour and the need for economizing its use. Under normal conditions the market system effectively solves this problem, attracting labour to those jobs and localities where it is most needed. In war-time such a solution raises further problems. Particularly under a "cost plus" system of contracting, wages tend to rise sharply and labour turnover tends to be great, with consequent loss of time and inefficient planning of production. Moreover, the fact that men are conscripted into the services makes doubtful the equity of such a system. Secondly, therefore, control is a deterrent of inflation. Thirdly, production in war-time often demands a greater mobility of labour between industries, occupations and localities than can be obtained in the short run without control. Munition industries must be vigorously expanded and labour attracted from very dissimilar types of work, factories must be situated with regard to strategic considerations and transport and power facilities, and labour drafted to the new sites; while some localized industries must be expanded and labour brought from other districts. To achieve these changes with the speed requisite to the planning of campaigns and production, control is needed. Finally, this war has presented difficult problems of organization—the expeditious clearing of ships from ports, the clearing of air-raid damage and the like—and the mobilization of labour for tasks of this kind has suggested the need for direct control.

These are the basic reasons, each of which presents many aspects, why control in the economy has had to be extended to the control of the labour (and consequently of the lives) of men and women.

Methods. Various methods of control have been used. The oldest is the reservation from the armed forces of men above certain ages, according to their occupations. Men in occupations of especial importance to the national effort, e.g., engineers of various categories, would be reserved at early ages, whereas men whose labour was judged less necessary and the supply of which could safely be curtailed would be reserved only at a greater age—the younger men of those occupations would be available for military service. This was, of course, a device to maintain in employment certain types of workers considered to be of greater value in the production of warlike stores, exports or essential goods for the home market than they would be in the armed forces. Such men might be allowed to volunteer for the services, e.g., as tradesmen, for whom modern war makes great demands. This flexible system allowed continuous changes in the ages of reservation as more men could be taken into the armed forces and as experience or events showed there was, e.g., labour surplus to requirements in certain groups. It has, however, proved difficult to rectify mistakes in the other direction: men who have joined the services are not easily recalled into civilian life.

A weakness in the method of reservation by occupations was that, though it avoided the British failure of the war of 1914–18 to retain in industry men needed on the "home front," it did not ensure that there should be reserved from the services only those men actually engaged on essential production. And by reserving men who, despite their occupational qualifications, were not so engaged it both wasted man power and encouraged men to do other than vital work. This is not to suggest that the method of reservation by occupation was a mistake; it was probably the most efficient way of making a provisional distinction between those who could and those who could not be spared from industry to the services. But as the man power position became more stringent it became desirable to look more closely into the actual work being done by reserved men.

Reservation by occupation and age-group was by February 1942 in process of being changed to individual reservation according to the importance of the work being done by the individual. The change was being brought about by the simple expedient of raising by one year every month the age of reservation in the different occupations. Each month, therefore, a number of men become dereserved and the importance of the work they are doing is considered. It is upon an assessment of the importance of the work and of the scarcity of their skill that a decision is made as to whether these men are allowed to continue in their employment (as, of course, most will be allowed to do), whether they are transferred to other and more vital work, or whether they can be released from industry to serve in the forces. Each month, therefore, from January 1942

the work of a section of the men of the community was to be considered in relation to the needs of the country for men for the armed forces, for munitions and instruments of war, for civilian supplies and services, and to the supply of women to take the places of men in industry.

The ministry of labour and national service has power to register for national service men between 18 and 51 years and to direct them to leave their employment and if necessary their locality to do essential work, and the registration of men for national service or the dereservation of men provides opportunities for such direction. However, local labour supply committees report upon shortages and surpluses of different classes of workers, and men have been moved on the basis of such intelligence. The ministry of labour and national service is empowered to direct women to register under the Registration for Employment Order, and women so registering may be directed to take up work of national importance. It was the intention to register women up to the age of 40 years by the spring of 1942. In general, unmarried women between 20 and 30 years may be directed into one of the women's branches of the services, although on registering they are invited to express a preference between the services and industry. These women are pre-eminently the so-called mobile women who will, if necessary, be directed to take up work of national importance away from their homes, though women over 30 without domestic ties may also, in the event, be called upon to leave their homes. It is the announced intention of the ministry of labour and national service to use the services of married women and mothers to the greatest possible extent by finding work for them near their homes, by arranging where possible part-time work and by organizing the care of children.

Extension of Principle of Conscription. In this way, the principle of conscription has been extended from military service for men to include the conscription of women into the armed forces, and finally to cover the direction of men and women to work according to the requirements and the interests of the state. And a further extension of the interests of the state into the activities of citizens is marked by the registration of young persons of both sexes, who will not be required but will be persuaded to undertake in their leisure hours activities which will be of immediate help to the nation, e.g., enrolment in the Home Guard, or which will fit them for better service in the course of time, as for example by joining the Boy Scout or Girl Guide movements.

A better utilization of labour is achieved by the requirement of the ministry of labour and national service for many men and women who have registered for national service or for employment to be engaged for employment only through labour exchanges. In this way, the movement of labour can be guided into the required channels and an influx of labour prevented either into industries which it is national policy to contract or into localities where, for any reason, an increase in the population is not desired.

These are the important methods of control, though there is other action by the state which may be allowed to fall within this term. In the ports, for example, schemes have been worked out and adopted whereby a pool of labour is formed which can be directed to where it is most urgently needed for the loading or unloading of vessels. Agreements have been achieved between the state and trade unions whereby trade union rules and customs are held in abeyance during war-time to allow, e.g., dilution and the employment of women on what previously were men's jobs. Strikes, without notice of intention, have been declared illegal. These are methods of control in that, whether or not by agreement, they alter the normal methods of work or the peace-time contours of the labour market.

Keystone]
GIRLS CALLED UP FOR NATIONAL SERVICE REGISTERING AT THEIR LOCAL EXCHANGE

Problems Associated with Control. There are a number of difficult problems inseparable from the controls adopted which have had, of necessity, an effect on the ways these controls have been used. Most troublesome, perhaps, of all have been those connected with the direction of labour entailing movement of people from their homes or working in places inconveniently situated in relation to their homes.

Moving workers from one locality to another encounters least reluctance when they are enabled to be accompanied by their families. But in war-time this is clearly very difficult. To find housing accommodation for the families of the many workers needed to man new factories has in many districts been made less easy by the residence of people evacuated from danger areas: to build accommodation would place an unbearable strain on man power. Hence recourse is necessary to the splitting of families and the billeting of workers. This in turn raises problems of feeding arrangements, which have been partly solved by the establishment of works canteens and British Restaurants. Clearly to use man power wisely and efficiently something more is needed than policy and decision. It is necessary to help workers to adjust themselves to new lives, and this must make demands upon the goodwill of the public towards transferred workers.

Transport presents another difficulty. Workers are moved to factories situated far from their homes and new factories are built in outlying districts. When railways are already under pressure from increased freight traffic, road services reduced by fuel rationing and impeded by black-out restrictions, the organization of travelling facilities for war workers to a degree that will maintain efficiency presents real problems. Here again co-operation by the general public is very desirable so that unnecessary travel may be avoided.

One should mention, too, the strain put upon family life. The discomforts that arise when all adult members of the family are working or when they are separated are real, but in large part unavoidable—though they can be eased

by provision of meals at the factory, the allowance of time for shopping and the provision of efficient transport. But the difficulties arising from a young family are less easily dismissed and unless met must necessarily reduce the woman power available for work. Up to the spring of 1942 little organized assistance had been extended to the mother, who had had largely to rely, if she could and would, on the good offices of neighbours or relatives, and few nursery schools had been established.

It is difficulties of all these kinds which hamper the use of the very complete powers the state now possesses for mobilizing the man and woman power of the country.

It is true that the use of Britain's labour resources has been made less efficient by the absence of any visible long-term programme matching the use of labour with the programmes of production and of the armed forces. The country was hampered by shortages of particular types of labour required for the development of production. And this could, to some extent, have been avoided had the requirements of labour been considered in detail when the future production of the different departments was decided upon. It could then have been discovered to what extent, if at all, these plans were incompatible with one another by virtue of their rivalry in the labour market, and to what extent assistance could be rendered to achieve these plans by taking steps to have adequate supplies of labour of the different skills and grades available at the dates at which they would be expected to be wanted. For, it must be remembered, it may be more difficult to train workers than to build factories or even to equip them.

The same necessity is evident for the planning of the location of factories. The same care is needed to obtain full information of the demands of different departments and of the labour supply available in a particular area. It is planning of this kind and resolution, at an early stage, to obviate rivalry between different departments and even between different contractors, that is necessary if obstacles to an extension of production are not to occur because of shortages in the labour supply. On the other hand, in so surprising a war, with so many changes in strategic needs arising from so many appearances and disappearances in the ranks of the countries fighting the Axis, efficient and consistent planning of the use of British labour would have been very difficult indeed. (J. S.)

POST-WAR RECONSTRUCTION. A Survey of Thought and Action in 1941. Reconstruction is a single word, but it covers a multitude of things. Looking back, at the end of January 1942, over the last year, one noted many plans suggested by planners, and a number of things done (or at any rate entered on the list of agenda, as things to be done) by statesmen. A brief record of both is attempted in this article.

(*a*) In the realm of recent thought, and among the many plans suggested by planners, there were four lines of approach which seemed to claim particular notice. The first may be called the line of American approach. Here Mr. C. K. Streit, who had already published before the war his book called *Union Now*, which led to the movement of Federal Union, added, in the course of 1941, a new book with the title of *Union Now with Britain*. It is a vigorous and moving plea for an immediate federal union—mainly on the basis of the American constitution, but with some modifications in the direction of the British cabinet system—between the United States, on the one side, and Great Britain and the five Dominions of Australia, Canada, Eire, New Zealand and the Union of South Africa, on the other. Such a federal union, proclaimed and inaugurated even during the course of hostilities, would in Mr. Streit's view help to end the war, to establish a permanent peace, and to ensure the security of the world. Professor Catlin, an Englishman who has held a chair of political science in an American university, added a pendant to Mr. Streit's *Union Now with Britain* in a book entitled *One Anglo-American Nation*. His book, too, is largely directed to the union of the United States with the British Commonwealth, in a common "Anglosaxony." But it has also a European side, and it looks to France and the northern States of Europe as well as to the Anglo-Saxon world; nor has its argument the swift immediacy which is a feature of Mr. Streit's plan. Professor Catlin is wedded to British ideas of gradual and progressive effort; and his scheme is a scheme not for a world at war, but rather for a post-war world.

A second line of approach may be called the line of the British Commonwealth. This was the line followed by Mr. Lionel Curtis in a brief but pregnant pamphlet published in the summer of 1941 under the title of *Decision*. Mr. Curtis—deeply versed in the conduct as well as the study of affairs for over thirty years past, and already concerned in the first beginnings of South African union in the first decade of this century—had already published, as long ago as 1916, a plea for imperial federation in a work called *The Problem of the Commonwealth*. He renews the plea, but he also extends its scope, in his *Decision* of 1941. He still argues in favour of turning the British Commonwealth into a federal State, with a federal parliament and cabinet competent for purposes of foreign policy, defence, and the measures of finance required for foreign policy and defence, but with the parliament and cabinet of each member-State still retaining control of the social composition and the economic structure of its own community, and thus retaining the power to pass its own immigration laws and to impose its own tariffs. He now adds, however, a new extension to the scope of his plan. He puts to himself the question, "What of countries like Belgium, Holland, Denmark and Norway?" He answers, "Let us offer them the chance of joining the union on the same terms that Britain and the Dominions have already established between themselves." He puts to himself the further point, that "we cannot ignore our responsibilities after this war to our allies, Czechoslovakia, Poland, Yugoslavia and Greece"; and he meets the point by suggesting that if the democracies of western Europe unite with those of the British Commonwealth, the union could be opened, on exactly the same footing, to our eastern allies. On Mr. Curtis's scheme, therefore, a federated British Commonwealth becomes a European magnet, and draws into its company, on terms of equality with Great Britain and the British Dominions, European States both in the east and the west. Indeed he goes further still. He suggests that when Germany had acquired a government responsible to Germans at large, the time would be ripe for her inclusion. He even dreams that the miracle which Mr. C. K. Streit has suggested—the union of the United States with the British Commonwealth—would be less unlikely to happen if the people of the United States could be presented with a federated British Commonwealth which they could join without surrendering (as in the scheme of *Decision* no member-State would be required to surrender) their control of their own immigration laws and their own tariffs.

Scheme for a Federated Europe. A third line of approach

may be called the European. Unlike the first two (which both, if in different ways, depend on the basic idea of Anglo-Saxon community, irrespective of continents), this line of approach depends on the basic idea of the community of the continent to which we belong. One of the representatives of this line of approach is Sir George Young, in his book called *Federalism and Freedom*. A European diplomatist, versed in European affairs, Sir George is perhaps in the line of descent from Aristide Briand and his conception of a United States of Europe. He advocates a federation of Europe in which no member-State, *unless it is itself federal*, may have a population of more than 10,000,000. It follows on his plan that all States with a population greater than that amount—France, Great Britain, Germany, Poland and the rest—must decompose themselves first into federations in order to join, along with the other and smaller States, the Union of Free Federated Europe, which would thus be a federation itself consisting, in large part, of federations. The model for this Union of Free Federated Europe is to be found in the constitution of Switzerland. Thus Europe will be set *fare da se* and to achieve its own salvation (with an economic constitution on the Portuguese model added to a political constitution based on the Swiss); and the United States, and perhaps the British Dominions, free from the problem of Europe, will cultivate their own gardens.

This is perhaps an airy scheme; but it brings into relief a fundamental difficulty of British policy which inevitably confronts all makers of plans—the difficulty that Great Britain is trilateral, touching on one side the United States, on another the British Dominions, and on another the continent of Europe. Any feasible plan must be accommodated to this fundamental fact, which is also a fundamental difficulty. A sober regard for this fact and this difficulty is particularly shown in two broadsheets issued by the organization called Political and Economic Planning, in the latter half of 1941. The first (No. 172), which goes by the name of "The Future of Germany," suggests that the post-war settlement of Europe should be along the lines of the British Commonwealth rather than of a written constitution—in other words that, instead of the British Commonwealth being first federated and then used as a magnet to attract western and eastern Europe (as Mr. Curtis suggests), it should remain unfederated, as it stands, and should serve as a *model* for some union of Europe or some system of a number of regional unions in Europe. Not only is the British Commonwealth to serve as a model for Europe, according to the argument of this pamphlet: Britain must also take an initiative and incur responsibility in Europe, "in the long-term interests of the European majority and in the convergent interests of the U.S.A. and the Dominions." The second pamphlet (No. 182), which is called "Britain and Europe," carries these ideas into further detail. Assuming that European unity involves the leadership of some great power, and that Britain is faced by the duty of acting as that power, it seeks to suggest the basic principles of a European commonwealth which Britain might take the lead in establishing. On the political side the argument is once more advanced that the approach should be empirical, and based on the experience of the British Commonwealth as it stands: on the social and economic side a number of suggestions are offered (particularly in the matter of the training of a service for European reconstruction) which deserve the most careful study. The general pattern which emerges is that of a new Europe aided and for the time being led by Britain, with a European conference at its centre on the model of the imperial conference, and with that conference regularly attended by all foreign ministers, served by a strong permanent secretariat, and regularly meeting in London for the discussion of European affairs. This is but a jejune sketch of the gist of these two pamphlets, which every reader is advised to read and ponder for himself. They show a sobriety and responsibility of judgment which should win them the closest attention.

(*b*) **Active Developments.** In the realm of action, and of things done or placed on the list of agenda by statesmen, there is less to note on the subject of reconstruction, but the record, even though brief, is pregnant with importance for the future. In the first half of the year 1940 it was the development of British relations with France (tending, as it then seemed, to a closer and closer union) which appeared to be of cardinal importance. The climax of this development—which also proved, for the moment, to be its end—was the offer of Anglo-French union made by the British Prime Minister on June 16, 1940. What negotiations had preceded the scheme, and how far it had been sought on the French side as well as offered on the British, we do not yet know. What we do know is that the scheme now hangs, as it were, in a vacant interstellar space, rejected by France in her hour of ruin, and left silently on the record by Britain. What we may guess, and what many of us cannot but deeply believe, is that in any scheme for the reconstruction of Europe a new and reconstructed France must be drawn into close alliance and active co-operation. A new Europe will need the light and leading which we may hope that a new France, true again to her old traditions, will wish and be able to give.

Meanwhile, in the course of 1941, the development of statesmanship turned in other directions. It turned, in the first place, in the direction of the United States, and towards closer and closer co-operation between Britain and the United States. The result was seen in the Atlantic Charter, as it came to be called, of August 1941. Perhaps the greatest and most cardinal fact of this charter was not its substance, but its signatories; not the noun "Charter," but the adjective "Atlantic." In a word, the fact of a joint declaration by the President of the United States and the British Prime Minister was the supreme fact. The actual substance of the charter was inevitably of a very general character; but some of the provisions (though even they must obviously be clarified and specified further) were more concrete. Among these were the provision for enjoyment by all States of access on equal terms to the trade and raw materials of the world needed for their economic prosperity, and the provision for economic collaboration between all nations for securing improved labour standards, economic advancement and social security. The charter generally, since its issue in the August of 1941, has received a new measure of adhesion and a new wealth of signatures both from the Allied governments in Great Britain and from the twenty-six governments who endorsed it at Washington on Jan. 1, 1942.

"Europe in Britain." Another direction in which statesmanship turned was that of the formation of something in the nature of a common council of the governments of the British Empire and the Allied governments now resident on British soil. Interallied War Conferences began to be held at St. James's Palace on June 12, 1941; a second followed on Sept. 24, at which the Atlantic Charter was accepted; and in these meetings may already be seen something of a system of consultation and co-

Keystone]

THE ALLIED AND IMPERIAL CONFERENCE AT ST. JAMES'S PALACE, LONDON, IN JUNE 1941. ON THE KING'S LEFT IS GENERAL SIKORSKI AND ON HIS RIGHT THE DUTCH PRIME MINISTER. MR. CHURCHILL IS AT THE LEFT OF THE PICTURE

operation between the British Commonwealth on the one side and the States of western and eastern Europe on the other. Whether or no the British Commonwealth becomes a model, or even a magnet, for Europe, and whether or no it assumes a responsibility for leadership in Europe, it is already engaged in a close connexion with Europe. This is a natural result of the residence on British soil of a number of European governments (the Norwegian, the Dutch, and the Belgian: the Polish, the Czechoslovak, the Yugoslav, and the Greek), and of the fact that no small part of Europe is now, in a sense, domiciled, so far as its governments are concerned, in Britain. This present situation of " Europe in Britain " is the natural germ for a future policy of " Britain in Europe," on the lines sketched in the planning broadsheets already mentioned. The Interallied War Conferences are already a European organ, which may assume a permanent character, in a new and amplified form, as new developments provide the stimulus. In this connexion the proceedings of the second conference, of Sept. 24, were especially important. Not only did the members of the conference (including the representatives of the Soviet Union) express their adherence to the common principles of the Atlantic Charter, and their intention to co-operate in giving them effect. They also adopted a resolution in favour of building up a common supply of food and raw materials for the post-war needs of European countries after their liberation, and for the establishment of a joint bureau for this purpose, reporting to a committee of Allied representatives. Here is a germ, which may well grow, of European co-operation in the work of reconstruction.

A third and last direction in which statesmanship turned was that of the preparation of what may be called regional federations, or unions, between contiguous European States. Having fallen because they were divided, States have resolved to stand united. As long ago as November 1940 Poland and Czechoslovakia drew together for this purpose, and in January of the present year (1942) the governments of both countries agreed on a number of essential points with regard to their future confederation —a confederation which they desire should embrace other States with which their interests are vitally linked. The governments of Greece and Yugoslavia were also drawn together, and initiated, almost simultaneously, a movement towards Balkan union, which was warmly welcomed by the Polish and Czechoslovak governments as a collaborator in assisting the security and developing the prosperity of the region between the Baltic and the Aegean seas. The regional reconstruction of Europe is thus already begun.

This survey has been confined to post-war reconstruction in the broader sense in which it affects Europe at large. Some few words may be added in conclusion on reconstruction as it affects Great Britain and so far as it was being planned by the government in 1941. (Nothing can be said in regard to the numerous voluntary societies and groups which were also engaged in planning.) From January 1941, the minister without portfolio, Mr. Greenwood, as chairman of a group of ministers, and pending the formation of a separate ministry for this purpose towards the end of the war, was responsible for considering the practical problems of transition from war to peace and for outlining a policy, for the immediate post-war years, likely to command national support. Lord Reith, the minister of works and buildings, acting within the framework of Mr. Greenwood's general study, and assisted by a small group of ministers, was responsible for considering the general problems of town and country planning, immediately in the areas damaged by the war, but ultimately on a general scheme. He appointed committees (such as the Uthwatt committee for the examination of the problem of sites in bombed areas, and the Scott committee for the consideration of building and constructional development in rural areas): he instituted a consultative panel of advisers on physical planning; and he had before him the report of the Barlow commission (issued in January 1940) on the distribution of the industrial population. (E. B.)

PRICES, INCOMES AND STANDARDS OF LIVING. From the outbreak of the war to the end of 1941, wholesale prices in Great Britain rose by about 60 per cent, retail prices by about 30 per cent and wage rates by about 20 per cent. Behind these statements of facts, there are hidden vast government schemes of restriction and control of materials of all kinds, rationing, control and price-fixing of goods sold retail, and wage-fixing and wage advances and increases in the hours of labour, and increases in output and the national income.

Wholesale Prices. The increase in wholesale prices was not at the same rate during the 2 years and 4 months since the outbreak of the war, nor was it distributed equally throughout the various items, price records of which are included in the construction of price indices. The summary table at the top of the following page, gives some detail which will illustrate the history of prices from 1939 to 1941.

With the change over from a peace economy to a war economy, and the complete dislocation of foreign trade and shipping, costs of importing goods naturally increased —in addition, there were inevitable increases in rates of insurance on ships and cargoes—consequently there was a greater increase in wholesale prices of food and tobacco compared with those of materials at the immediate outbreak of the war. On the average, in the first four months of the war, Sept.–Dec. 1939, the wholesale price index rose by 16·3 per cent, the increase in the food and tobacco group being 22·1 per cent and that in the materials group being 13·4 per cent. Where imports bulk largely in British economy, e.g., cereals and cotton, the percentage increases were greatest, 35·9 per cent and 32·0 per cent respectively. On the other hand, the increase for coal was only 5·7 per cent.

On the average, for the year 1940, prices rose, compared

with Aug. 1939, by 39·3 per cent. The largest increases were for cereals (64·3 per cent), cotton (54·0 per cent) and wool (53·4 per cent), and the smallest was that for coal (19·3 per cent).

BOARD OF TRADE WHOLESALE PRICE INDEX (1930 = 100)

Group	Index Numbers					Percentage Increase from Aug. 1939			
	Aug. 1939	Sept.–Dec. 1939	Year 1940	Year 1941	Dec. 1941	Sept.–Dec. 1939	Year 1940	Year 1941	Dec. 1941
Cereals	84·0	114·1	138·0	150·4	168·0	35·9	64·3	79·0	100·0
Meat, Fish and Eggs	84·3	98·9	114·6	118·1	116·0	17·3	35·9	40·1	38·8
Other Food and Tobacco	100·1	116·8	143·3	166·5	167·5	16·7	43·1	66·1	67·2
All Food and Tobacco	90·4	110·4	132·7	146·1	150·5	22·1	47·3	61·7	66·6
Coal	117·4	124·1	140·1	159·5	162·8	5·7	19·3	35·8	38·6
Iron and Steel	128·6	135·1	159·2	181·1	181·7	5·1	23·8	40·8	41·3
Non-Ferrous Metals	100·7	107·0	123·2	123·9	124·1	6·3	22·4	23·0	23·2
Cotton	81·4	107·4	125·3	138·2	142·4	32·0	54·0	69·9	75·0
Wool	102·6	120·3	157·3	170·1	171·9	17·2	53·4	65·8	67·5
Other Textiles	74·1	92·3	108·5	120·2	126·5	24·6	46·5	62·3	70·6
Chemicals and Oils	93·0	99·9	117·1	126·9	129·7	7·4	25·9	36·5	39·5
Miscellaneous	96·1	115·9	142·6	169·1	172·6	19·5	48·4	76·0	79·6
All Industrial Materials, etc.	102·2	115·9	138·4	155·8	158·4	13·4	35·4	52·5	55·0
All items	98·1	114·1	136·6	152·6	155·9	16·3	39·3	55·5	59·0
Basic Materials	94·5	117·7	147·3	166·7	170·5	24·6	56·0	76·5	80·5
Intermediate Products	104·0	118·9	145·0	165·1	167·7	14·3	38·4	58·8	61·3
Manufactured Articles	108·7	116·8	133·7	148·4	150·3	7·4	23·0	36·5	38·3

In the next year the rise in prices generally was slowed down. The average for the year 1941 was 55·5 per cent above Aug. 1939, i.e. only 11·7 per cent above the general level of the year 1940.

The change in the tempo of increasing prices may be indicated by reference to comparisons of Aug. 1939 with Aug. 1940 and Aug. 1941. In the first 12 months of the war the general level of prices rose by 43 per cent (16·3 per cent was the average increase in the first 4 months, Sept.–Dec. 1939), in the next 12 months (Aug. 1940 to Aug. 1941), the general level of prices increased by 9 per cent. In the next four months, from Aug. 1941 to Dec. 1941, the increase was 1·8 per cent. Thus the gradual monthly change declined.

During 1941, many prices were for practical purposes stabilized, the relevant indices hardly changing at all.

The following table shows the individual changes in the year 1941.

BOARD OF TRADE WHOLESALE PRICE INDEX

Relative Changes (*Dec.* 1940 = 100; *Increase* +, *Decrease* −)										
Cereals	Meat, Fish and Eggs	Other Food and Tobacco	Coal	Iron and Steel	Non-Ferrous Metals	Cotton	Wool	Other Textiles	Chemicals and Oils	Miscellaneous
+ 14	− 4	+ 3	+ 7	+ 1	+ 1	+ 11	+ 3	+ 15	+ 6	+ 7

The level of prices of the meat, fish and egg group actually declined during the 12 months. The largest increases continued to be in the cereals and textile groups.

The Times]

COMMUNAL MEALS—IN ONE OF THE BRITISH RESTAURANTS INSTALLED IN PLYMOUTH FOR FEEDING THE WORKERS WHOSE HOMES ARE OUTSIDE THE CITY

With war-time control and stabilization of some prices, and with restrictions on freedom of enterprise, and with lack of competition amongst traders, the meaning and purpose of wholesale price indices change. The Board of Trade figures do enable us to keep in a concise form records of changes which occur during war conditions, but some doubt must exist as to the exact comparability of the series of indices which is now being computed with that computed before the war. There are probably difficulties in obtaining quotations of prices of certain goods which are exactly comparable with those used before the war started.

It is interesting to make a comparison between the changes which took place in the first two years of the present war with those which occurred in the first two years of the war of 1914–18. According to the *Statist* index of wholesale prices, the change was an increase of 61 per cent from Aug. 1939 to Aug. 1941, the indices being 90·4 and 145·1 respectively. According to the *Economist* index of wholesale prices, the increase was 51 per cent, the respective indices being 70·3 and 106·4. From July 1914 to July 1916, the *Statist* index showed an increase of 58 per cent and the *Economist* an increase of 62 per cent. Approximately, the same change took place in the first two years of the present war as occurred between 1914 and 1916, an increase of some 50 to 60 per cent.

Retail Prices. For the first two years of the war of 1914–18, the Ministry of Labour's cost of living index shows a rise of some 45 to 50 per cent, while for the same period the food index rose by 61 per cent. These are obtained by comparing July 1916 with July 1914. For the present period, the same official index indicates a rise in the cost of living from Aug. 1939 to Aug. 1941 of 28 per cent, the food figure being 22 per cent. There is a striking difference between the recent course of these retail indices compared with the experience of 25 years ago, and that of the wholesale indices. In the present war, government management, by rationing, control and subsidies, regulated the increase in the cost of living to barely half of that which took place in the less restricted conditions of the first two years of the last war.

In the first month of the present war the official cost of living index rose 10 points from 155 at Sept. 1, 1939, to 165 at Oct. 1, 1939, an increase of 6½ per cent. During 1940 the index rose from 174 at Jan. 1 to 196 at Jan. 1, 1941, an increase of 12½ per cent. During the year 1941, the index changed very little, from 196 to 200, an increase

of 2 per cent. The slowing down of the increase in wholesale prices previously noted was thus accompanied by a similar slowing down of the increase in the cost of living index. Of the constituent items of the cost of living index the most important is food. With price regulations, the increase in the price of food during the war period was not great, apart from that which took place on the outbreak of the war. During 1940, on the average, food prices rose by 9½ per cent. During 1941, food prices actually declined on the average by about 4 per cent. For the most part, during this period, prices were stable. The chief cause of the decline was the lowering of the price of fish and eggs.

The next most important item in the cost of living index is rent. This index has been practically unchanged since the war. It was 162 in Aug. and Sept. 1939 and rose to 164 in May 1940 and remained at the same figure subsequently. The greatest changes were those for the clothing index. This was 205–210 at the outbreak of the war; it rose to 290 at Aug. 1940, to 380 at Aug. 1941 and to 395–400 at Dec. 1941. This index increased by about 90 per cent. The fuel and light figure was 180 at Aug. 1939, 182½ at Sept. 1939, 212 at Aug. 1940, 228 at Aug. 1941 and 230 at Dec. 1941. There was an increase of about 28 per cent in this item. A similar change was recorded in the miscellaneous part of the cost of living index.

Since the beginning of the war, meat prices increased by about 20 per cent, bread and flour prices hardly changed, sugar and milk prices increased by about 30 per cent, butter prices rose by about 20 per cent, the price of margarine by about 12 per cent and that of cheese by 30 per cent. The price of fish had increased by 100 per cent at the middle of 1941, but at the end of the year the increase was 42 per cent. During the year, the increase in the price of potatoes varied between 30 and 50 per cent.

The original purpose of the cost of living index number, to measure the change in the cost of maintaining a hypothetical family on a certain standard of living, was necessarily defeated with the introduction of rationing, particularly of foodstuffs and clothing. Even before the war some doubt had been expressed regarding the appositeness of a cost of living index based primarily on budgets which had reference originally to the year 1904. The Ministry of Labour had, in fact, undertaken to investigate working-class budgets on a grand scale in 1937–38, and by the beginning of 1942 would probably have introduced a new index based on this more recent experience. With the onset of the war, much of this work was inevitably postponed, but some important results of their inquiries were published in the *Labour Gazette* of Dec. 1940. These related to some 8,900 industrial households, the original choice of households having been a random one.

The official cost of living index only pretended to have regard to basic expenditure, a comparatively small number of foodstuffs being included. Jams, cocoa, coffee, fruit and vegetables (apart from potatoes) were excluded. Only a few items were included under the heading of miscellaneous: soap, ironmongery, newspapers, tobacco, fares, etc. When the relative expenditures on the various items which were included in the original computations of the cost of living index are obtained from the results of the new 1937–38 inquiry, and these new figures are used for weighting purposes in the construction of a cost of living index, the final result is not very much different from the official figure. Naturally, changes occur if more importance is attached to the miscellaneous group, i.e., if entertainment, magazines, furniture, more insurances, and so on are included as a basic part of living, and if the list of foods is extended to include fruit, preserves, etc. In effect, we should be constructing a new index number based on the 1937–38 experience of the standard of living.

We can compare the average expenditure obtained from the 1937–38 inquiry with that of present day rationing. On the average, an industrial household of 3·77 persons spent 4*s.* 8½*d.* on meat, about 17·8*d.* per person. For the greater part of 1941, the meat ration was 1*s.* 2*d.* per person, which, allowing for the rise of about 20 per cent in price since the war, corresponds to 11·7*d.* on the basis of pre-war prices. Thus, effectively, on the average, instead of 17·8*d.* being spent on meat, the amount is 11·7*d.*, a reduction of about 35 per cent. On the average, in 1937–38, the industrial household bought 22·4 oz. of bacon; the present ration for 3·77 persons is 15 oz., a reduction of 33 per cent. Again, in 1937–38, the industrial household purchased 48 oz. of butter, margarine and lard. For the greater part of 1941, a household of 3·77 persons could purchase only 30 oz., a reduction of 37 per cent. Moreover, whereas the proportion in 1937–38 of butter to margarine and lard was 3 to 2, in the present rationing scheme the proportion is 1 to 3. As for sugar, the average industrial household purchased 4·8 lb. in 1937–38, and the ration during the greater part of 1941 for 3·77 persons was 1·9 lb., a reduction of 60 per cent. The ration of fats was increased by 2 oz. per person on Nov. 17, 1941, and that for sugar was increased by 4 oz. on the same date, and in addition there was an extra 8 oz. for four weeks in the summer of 1941.

Apart from bread and flour, there was, for each person, a considerable reduction in the consumption of basic foodstuffs. As a result of this reduction, consumers endeavoured to supplement their purchases by buying alternatives. These gradually were brought under control, and rationing was instituted in order to ensure a fair distribution. Fish prices soared, compared with other prices.

Clothing coupons helped to ensure a reasonable distribution of necessities to all, and at the same time the purchase tax helped to discourage the buying of luxuries. We have previously referred to the great increase in the prices of clothing since the outbreak of the war. It is practically impossible to measure the reduced purchases of clothing due to the coupon scheme and the increase of prices, but there is no doubt of this reduction for the civilian population. Also, there had been a reduction of travelling facilities. Prices of entertainment were higher in 1941 than in 1938–39. The general standard of living, which included all such amenities at the service of the community, had been reduced in certain respects. On the other hand, the public social services, health, education, etc., existed in 1941 at the same level of excellence as before the war.

Standards of Living and Incomes. It is difficult to assess the extent by which standards of living had changed since the war. A vast number of people called up for war service had had their lives completely changed, so that for them a direct comparison is impossible. A part of the civilian population had undertaken part-time service of one kind or another, and had thus substituted one method of spending leisure for another. Travelling was restricted and there was probably more book reading, and certainly more smoking. Freedom of choice of ways of spending money was curtailed, and there was always present the urge to buy war savings certificates. There is one crude qualitative method of estimation—that of health. According to reports of the Ministry of Health, the nation's health had not deteriorated since the outbreak of the war.

In the early part of 1941, a report referred to the large number of cases of cerebro-spinal fever in the previous year, but the death rate from this cause was considerably less than it had been formerly.

Since the outbreak of the war, advances in wage rates had been made to the extent of about £5,000,000 per week. This represents an increase of about 20 per cent in wage rates. From information obtained by the Ministry of Labour (*Labour Gazette*, Dec. 1941), it is estimated that the increase in *earnings* at July 1941 over October 1938 was 42 per cent. This was due to longer hours being worked, increase in rates of wages, extension of the system of payment by results, and changes in the constitution of the labour force as to age, sex and occupation. It is pertinent to note that, whereas in Aug. 1939 there were about 1¼ million unemployed, at the end of 1941 there were only about a quarter of a million unemployed, according to the Ministry of Labour's unemployment statistics. Thus, to compensate for an increase in cost of living of 28 per cent, the official figure (or more, if we pay regard to the fact that to make up for diminished supplies of foods which have not risen greatly in price, workers have to buy other foods, such as fish, potatoes and green vegetables, which have increased more in price), there was an average increase of earnings of 42 per cent.

Official estimates of national income and expenditure published in " An Analysis of the Sources of War Finance and an Estimate of the National Income and Expenditure in 1938 and 1940 " (Cmd. 6261, 1941) enable one to get a picture of changes since the war in the distribution of the national income between private and government expenditure. The following figures are drawn from this report.

	1938	1941 (estimated from fourth quarter of 1940)	Percentages, allowing for an increase of 20 per cent in prices	
			1938	1941
	Amounts in £million			
National Income	4,415	5,804	100	109½
Personal Expenditure	3,400	3,652	77	69
Government Expenditure	840	3,892	19	73½
Investment (+) or Disinvestment (−)	+ 175	− 1,740	4	− 33

In 1938, the total national income was divided up between personal expenditure, government expenditure and investment in the proportions 77 : 19 : 4. It is estimated that the total national effort had increased by 1941 by about 9½ per cent. But personal expenditure had declined from 77 out of 100 to 69 out of 109½; thus although the total output had increased, personal expenditure had declined. On account of the war government expenditure had increased to 73½ out of 109½; this being achieved partly by the increase in real output, partly by the decline in private consumption, and partly by disinvestment or drafts on capital. These figures show briefly the effects of the various schemes of price control, rationing and restriction. In 1938, before the war, the private individual consumed 77 per cent of his output. It is estimated that, during the year 1941, based on figures for the last quarter of 1940, the private individual consumed 69 units out of an increased output of 109½, or 63 per cent of his output. In a sense, the change from 77 to 69 gives a quantitative indication of the decline in the standard of living due to the war. The decline, in fact, is greater than this, because, under ordinary circumstances, an increasing output brings a higher standard of living. (E. C. Rh.)

PUBLIC HEALTH IN WAR-TIME. After more than two years of war it was possible to review in retrospect its effect on the health of the people, with reasonably good evidence for guidance. The usual annual returns of the registrar-general for England and Wales and of the ministry of health were not available, but information could be obtained from the weekly and quarterly returns, the latter of which had been augmented in important respects, and the results of certain special inquiries had been published. An analysis made in the *British Medical Journal* shows that the number of deaths in large towns fell from 303,271 in 1940 to 262,467 in 1941, but the relevance of these figures may have been vitiated by movements of the population. The infant mortality rate in these towns rose from 61 to 71 per 1,000 live births. The United Kingdom came through heavy enemy attacks from the air during the winter of 1940–41 without serious impairment of the general health of the population, although, of course, these attacks were reflected in a substantial increase in the deaths due to violence, especially in large towns. There is no evidence that regular resort at night to air-raid shelters had any deleterious effect by itself, but it probably contributed to the fatigue of workers which may have influenced the increase of tuberculosis. Some occurrences of a kind which are usually associated with war, and some which were unexpected, deserve special mention.

Acute Infectious Disease. The following table, also extracted from the *British Medical Journal*, shows the trend of infectious disease since 1937 as indicated by notifications.

	1941	1940	1939	1938	1937
Scarlet fever	57,982	65,573	78,201	99,413	95,859
Whooping-cough	169,863	53,403	—	—	—
Diphtheria	50,056	46,683	47,910	65,720	61,870
Measles	405,580	407,908	—	—	—
Pneumonia	49,547	47,712	42,275	45,117	55,816
Cerebro-spinal fever	10,986	12,791	1,506	1,293	1,157
Dysentery	6,485	2,843	1,963	4,210	4,066
Enteric fever (paratyphoid and typhoid)	4,687	2,824	1,524	1,347	2,157

Measles and whooping-cough were not generally notifiable before 1940, and the significance of their prevalence cannot be judged from such short-term statistics, because of the large periodical fluctuations which normally occur. In large towns the fatality rate of measles rose from 0·26 per cent to 0·34 per cent, and of whooping-cough from 1·3 per cent to 1·6 per cent, but the notifications which form the basis of these rates are probably too imperfect to justify the attachment of much significance to them. It is possible, however, that the disturbance of normal life by air raids in the latter part of 1940 and the first six months of 1941 may have reduced the chance of recovery of young children contracting these infections.

Mention has previously been made of the low incidence of most of the common infections of childhood after the outbreak of war, in spite of the expected effect of evacuation of children from dangerous areas.[1] New facts have come to light which indicate that this conclusion from general observations requires to be modified. Stocks has made a careful analysis of the areal distribution of scarlet fever and diphtheria and shown that, while the incidence of these diseases in proportion to the child population as altered

[1] *Encycl. Brit. Book of the Year*, 1940, Supplement, 25.

IMMUNIZATION AGAINST DIPHTHERIA IN PROGRESS AT A SCHOOL CLINIC

by evacuation fell in evacuation areas in comparison with neutral areas in the first six months or longer after war broke out, a substantial increase occurred in receiving areas. The mixing of infected immune children with susceptibles in protected areas seems therefore to have had the influence which had been apprehended before evacuation took place. These diseases, however, never reached serious epidemic proportions and the effect passed off fairly soon.

Cerebro-spinal Fever. The high incidence of this disease continued in 1941. Although notifications fell by nearly 2,000 as compared with 1940, the figure far exceeds anything recorded in other previous years. Cerebro-spinal fever seems to be repeating the behaviour it followed in the war of 1914–18, and a high but falling prevalence is to be expected so long as hostilities last. Accurate records of its power to kill are not yet available, but it is evident that the use of the sulphonamide group of drugs has very greatly reduced the case-mortality rate at all ages.

Diphtheria. The increase in the amount of diphtheria after two years of falling incidence is disappointing in the light of the great efforts made by local authorities to immunize children in their areas. It is probably correct to say, however, that very few populous places in Great Britain have yet attained that proportion of immune children (about 50 per cent) which has been found necessary in other countries before any significant effect on the volume of the disease can be expected. Like other infectious diseases diphtheria has its periodical ebb and flow, and it may be that there would have been still more of it but for immunization. Investigations in Liverpool by Prof. H. D. Wright demonstrate that variations occur from year to year in the proportion of cases due to different strains of C. diphtheriae [1] and it may be that a more invasive type is now assuming dominance.

[1] *J. Path. and Bact.*, 1941, 52, 283.

Respiratory Diseases. From the table of notifications it is evident that there has been some increase in pneumonia, but not to the extent usual in years when influenza occurs in epidemic form. In fact the latter disease, which caused such devastation in 1918, was not highly prevalent in 1940 and 1941. There was a great increase in deaths from respiratory causes, however, in 1940 as compared with 1939, which gave rise to a suspicion that the stress of air raids and shelter life might be causing the spread of respiratory infection. Close examination of the figures reveals that the increase was due mainly to bronchitis in elderly people, that it occurred chiefly in the first quarter of the year, before air raids began, and that it coincided with exceptionally bitter weather. A rather heavy mortality both from pneumonia and bronchitis in the first and second quarters of 1941 (not comparable in magnitude with that of the first quarter of 1940) may have been partly due to the influence of war-time conditions.

Alimentary Infections. One of the most disturbing features of war-time has been the upward tendency of enteric fever and dysentery, as shown in the table. The decline of these diseases had been one of the brightest passages in the long history of the public health movement. They were already on the up-grade in 1940, and the increase in 1941 was great. It was not due to air-raid damage of water or sewage installations; although damage of this kind was common, associated epidemics did not occur. Fortunately the increase is little reflected in mortality, since it was due, in the case of enteric fever, to the milder paratyphoid form, and to a large extent to the type of dysentery caused by B. dysenteriae (Sonne) which gave rise to a previous epidemic in the winter of 1937–38. There is no clear explanation of these occurrences, but several of the paratyphoid fever outbreaks were due to the consumption of pastries containing synthetic whipped cream. As paratyphoid is rarely spread by water, a definitely authenticated small outbreak so caused is of considerable interest.[1] Outbreaks of a mild form of diarrhoea affecting both adults and children were also common, but up to early 1942 bacteriologists had failed to trace the causative organism and inclined to the view that it might be some hitherto unrecognized virus.

Trichiniasis (trichinosis). Until recently this disease was regarded as extremely rare in Great Britain, and such routine post mortem examinations for evidence of past infection as have been made confirmed this impression. An account of eight small outbreaks, however, occurring since 1922 in South Wales has recently been given by Nancy Howell.[2] Further, during the winter of 1940–41 epidemics involving approximately the following numbers of cases occurred in England, viz., Wolverhampton 130, Hertfordshire 5, Birmingham 78, Cumberland 50–100. Investigation indicated that occasional cases may have been occurring in Wolverhampton for a number of years, perhaps as the result of the custom of eating raw sausage meat, to which the 1941 unprecedented epidemic was attributed. Efforts to trace the pigs from which the infested flesh responsible for any of these outbreaks was derived were unsuccessful, and extensive examination of pig carcases confirmed the view that the disease is rare in home-bred swine. This makes it unlikely that infection is carried on by garbage-feeding of pigs—the mode of transmission from animal to animal now accepted as common in the U.S.A.—and suggests that the rat may be

[1] *Emerg. Pub. Hlth. Lab. Serv., Mon. Bull.*, Feb., 1942, 1.
[2] *Pub. Hlth.*, 1941, 55, 5.

still regarded as the important vector for pig-infection in the United Kingdom.

Typhus Fever. The Spanish civil war aroused anxiety as to the introduction of typhus into western Europe by troops from Morocco, where the disease was prevalent at that time, but it was not till later that reports indicated its presence in considerable volume in Spain. Since the opening of the campaign in eastern Europe in the spring of 1941 well-authenticated accounts have been obtained of the spread of typhus westward from that area, and cases have certainly occurred in Germany. In view of the danger of its introduction into Britain by persons returning from an infected area the ministry of health issued a memorandum to public health officers [1] advising them as to the precautions which ought to be taken. These include the organization of diagnostic and preventive teams, the provision of hospital accommodation and arrangements for the reduction of louse infestation in the community. The Harvard field hospital unit of the American Red Cross placed a mobile team at the disposal of the ministry and local authorities.

Pediculosis. In connexion with the problem just mentioned it has become apparent from observation of evacuated children that louse infestation is commoner than was thought, and the inquiries of Kenneth Mellanby [2] have expressed its extent in precise terms. For instance, he found that 50 per cent of town girls at ages from two to twelve years had lice or nits in their hair. While typhus is generally thought to be carried only by the body-louse, which is much less common, it is thought possible that the head-louse may also act as a vector. The measures proposed for the eradication of lice may conveniently be mentioned in connexion with the cognate problem of scabies.

Scabies. For a few years before the war school medical records showed that itch was definitely increasing. It has become a serious problem during the war both among soldiers and civilians. Mellanby extended his investigations to this disease and found a sharp rise in war-time, reaching as many as 40 cases per thousand admitted to one hospital for other reasons during the first six months of 1941.[3] The minister of health therefore made the Scabies Order, 1941, which applies also to pediculosis. It enables the medical officer of health to require cleansing and treatment of verminous persons and articles, to inspect contacts and to seek out cases of infestation. In particular, health departments are now able to follow up to their homes school-children found to be verminous and to treat and disinfest the family and premises.

Tuberculosis. The registrar-general's quarterly returns disclose the rise in mortality from tuberculosis anticipated in the 1941 year book. Its decline, which had been continuous for many years and was seriously interrupted only by the war of 1914–18, was arrested in 1939 and reversed in 1940 and the first half of 1941. It seems likely that the history of the previous war will be repeated in this respect. The war-time increase is probably not due to the discharge of sanatorium patients at the outbreak of war, since such action was not taken in 1914–15 when a similar rise occurred, nor to shortage of food. It may be a consequence of overwork, long hours and irregular living, perhaps accentuated by the fatigue experienced by workers during the air raids of 1940–41. There is evidence of a general kind that a similar increase has occurred in other belligerent countries, and the state of affairs is said to be serious in the occupied low countries where it is probably intensified by privation.

Gastro-duodenal Disorder. Numerous articles in the medical press indicate that one of the greatest causes of unfitness among men recruited into the fighting services is disorder of the upper part of the alimentary canal, taking the form of gastric or duodenal ulcer in a large proportion of cases. Whether there is a real increase in such disorders as compared with former times, or merely more complete ascertainment, it is hard to say. It is at least certain that a large proportion of beds in military and emergency service hospitals have been occupied by such cases, and many men have had to be discharged for this reason. It seems unlikely that war-time dietary is responsible. Just as recruitment during the South African war revealed the presence of much physical defect in adolescence and led to the inception of the school medical service, the recent records of recruiting boards and the fighting services may point to new measures of preventive medicine directed at such chronic disability in the young adults of the present day. (R. M. F. P.)

SOCIAL WELFARE, MEASURES FOR PROMOTING. This war, like that of 1914–18, has turned a searchlight on the social life of the people of Great Britain. Like the last war too, it has shaken people and institutions out of all kinds of ruts. But its impact on individuals and families has been far closer. The billeting of industrial workers, teachers, staffs of evacuated business firms, service men and women and evacuated children and mothers has affected innumerable homes in reception and neutral areas. To be bombed out from office, shop or home has been the lot of many in towns. Change of occupation, of place and ways of living has been the experience of literally millions of men and women in industry and the forces.

To meet the social needs arising out of these war conditions new services of many kinds have come into being. Some have been developments of social experiments of pre-war days, some have been created to meet urgent and often unforeseen needs, others have come through the seizing of opportunities for new forms of social progress by far-sighted people.

Services' Welfare. Welfare services for serving men and women have been greatly extended in this war. Educational facilities have also been developed on new lines. The creation of an army welfare department at the war office, supported by county welfare officers and committees, was a new departure. So, too, was the formation of the council for voluntary war work to co-ordinate the work of the societies which had served the need of the forces in the war of 1914–18. Under their auspices over 5,000 canteens were set up, in addition to those run by local churches and independent bodies. These and the 3,800 institutes provided were only some of the ways in which the societies concerned were endeavouring to meet the social, educational, recreational and spiritual needs of the men and women in the new citizen armies.

Factory Welfare. In 1940 the factory department of the home office was transferred to the ministry of labour. This was followed by the setting up by the ministry of a factory welfare advisory board, charged with the promotion of the welfare of industrial workers. Eleven regional welfare officers were appointed—assisted now by close on 100 local welfare officers—concerned with matters affecting the welfare of workers outside the factory, including transport,

[1] *Memo. 252/Med.*, October, 1941.
[2] *Med. Off.*, 1941, 65, 39.
[3] *Ibid.*, 66, 141.

Keystone]

A CANTEEN FOR MINERS AT THE PITHEAD, GLASSHOUGHTON COLLIERY

billeting and recreational facilities. A central consultative committee together with specialized sub-committees was formed, composed of voluntary organizations with experience of various types of welfare service.

Housing of Workers.—Very soon the need for the housing of workers became urgent; billeting was not sufficient, nor possible in isolated districts where the new shadow factories were sometimes established. The ministry of supply accordingly built hostels mainly for women and girl workers at the royal ordnance factories. These were specially constructed buildings with accommodation for 100–1,600 workers who sleep in houses surrounding a dining and recreation building with community centre facilities. The ministry built and equipped the hostels, which were staffed and managed respectively by the Y.W.C.A. and Y.M.C.A. jointly, the Workers' Travel Association, the Holiday Fellowship and the Co-operative Holidays Association. In addition the ministry of supply provided houses on small housing estates for married key workers with families. These were managed by trained housing managers, usually directly from the ministry, though in one or two cases local housing associations acted as the ministry's agents.

The National Service Hostels Corporation provided hostels on behalf of the ministry of aircraft production and other factories. Agricultural workers' hostels, including those for members of the Land Army, were arranged for by the ministry of agriculture through local war agricultural committees and voluntary bodies.

Works canteens were another vital need—partly to help the family rations, partly for the benefit of workers where distances made it impossible to obtain the mid-day meal at home, or billet or hostel. Miners' canteens were a specially welcome institution.

Factory Concerts.—In factories during the lunch hour, concerts became a frequent occurrence, varying from the performance of a local concert party to the visit of artists belonging to the Entertainments National Services Association (E.N.S.A.), or a recital of chamber music by the staff of the Council for the Encouragement of Music and the Arts (C.E.M.A.). The former organization staffed by professional actors and actresses and other artists gave 52,000 concerts in factories apart from 156,000 performances to the forces through the help of the Navy, Army and Air Force Institutes (N.A.A.F.I.).

The Council for the Encouragement of Music and the Arts was the result of a venture by the Pilgrim Trust partnered later by the board of education (which afterwards assumed full responsibility) to provide opportunities in town and country, among the forces and in the workshops, for good music, the production of opera and plays, and the study of art. Some 8,000 concerts of all kinds, including concerts in shelters and rest centres, were given in 1940 and 1941, 1,500,000 people saw plays given by the fifteen companies touring the country. Just under 1,000,000 people saw the "Art for the People" exhibition, consisting of original paintings, reproductions and autographic prints. A further popular exhibition was that of "Living in Cities."

War-time Nurseries. With the entry of married women in increasing numbers into industry, the need for day nurseries for children under five became acute in certain areas. At the outbreak of war about 150 nursery schools and day nurseries, together with various residential nurseries in London and large towns, were evacuated to large country houses. Vacancies arising through children moving on to junior schools or for other reasons were filled by children who, through war conditions, had become social casualties. As conditions became graver owing to intensive bombing more such nurseries were opened. By Feb. 1, 1942, the number of residential nurseries had increased from the original 150 to 362, and the number of nursery places from 4,600 to 10,750. Of the 212 new nurseries, 114 had been provided by voluntary societies, substantially assisted by funds derived from the United States and the British commonwealth, and the remainder by local authorities, individual voluntary efforts and those carried on by the British Red Cross Society.

A new scheme for whole-time and part-time nurseries sponsored by the ministry of health and board of education and operated by local welfare authorities with the co-operation of local education authorities and voluntary organizations came into being. It was designed particularly to meet the needs of industrial workers. By the beginning of 1942 276 nurseries were open and over 600 in preparation. There was also a large extension of nursery classes in elementary schools.

An official scheme of minders or daily guardians was promoted by the ministry of labour to help where nurseries were not possible for lack of suitable premises or other causes. The ministry also gave grants in aid for the provision of play centres by the local education authorities for older school children whose parents were working long hours in industry and other forms of national service.

Social Centres. At the beginning of the war and again after the heavy bombing of the autumn of 1941, many mothers went to the reception areas with their young children. Housed very often in billets, they were at a loss how to spend their days without being an intolerable burden on their hostesses and themselves. So there grew up social centres or clubs in halls lent by churches and voluntary bodies or in empty houses. At the close of 1941 there were 443 social centres with occupational facilities and 287 without. While many of the mothers had returned to their homes in evacuation areas at the end of 1941, an official estimate of the mothers remaining in the country amounted to 145,000 apart from 100,000 scheduled as homeless or with special disabilities.

British Restaurants.—A particularly popular feature was the provision in some centres of communal meals such as were organized by the South Wales social service clubs for their London visitors. These were being transformed into "British Restaurants," where satisfying meals were avail-

able for all kinds of people. In towns of varying size these new forms of communal living were finding a place, intended for the public outside the scope of the big factory or communal canteens. British restaurants numbered 1,300 by early 1942. Some were run entirely by local authorities, though often with the help of voluntary workers. Others were run by voluntary bodies such as clubs or settlements.

Post-raid Welfare. The early rest centre leaders in London made experiments which influenced the development of the fine chain of rest centres available under the London county council. The appointment of a special commissioner for the homeless in the same area set on foot a remarkable scheme of re-housing and welfare in which local authorities, government officials, voluntary agencies and a team of experienced social workers co-operated.

Originally started as an aid to civil defence the Women's Voluntary Services by the end of 1941 had enrolled over 1,000,000 volunteers, who played an indispensable part in post-blitz work as auxiliaries of the local authorities. Another W.V.S. development was a vast clothing scheme in close association with government departments and local authorities for helping both homeless and evacuated families in need. In this, the timely aid of the U.S.A. and the Dominions and gifts from all parts of the world were of great value.

Citizens' Advice Bureaux. While war conditions were creating these various measures of social welfare, one service had been foreseen and prepared for since the crisis of 1938. The National Council of Social Service had then called into being a standing conference of voluntary organizations in time of war, whose first task had been the preparation of an information service to meet the numberless inquiries for which the anxious citizen would need an answer. The day war broke out a large number of citizens' advice bureaux were opened, those in London under the direction of the charity organization society, elsewhere through the help of local councils of social service, other voluntary agencies and public-spirited individuals Their main object was to provide for all citizens a centre of advice and information on all kinds of personal and domestic problems. Behind the bureaux grew up an intelligence service known as *Citizens' Advice Notes* which, from the information department of the National Council of Social Service, provided accurate information on legislative enactments and war-time services of every description. These *Citizens' Advice Notes* (later issued in book form with supplements as required) reached a circulation of 6,000. In addition to the workers of the 1,000 or more citizens' advice bureaux in towns over 600 people agreed to act as citizens' advisers in villages and isolated districts.

Old People's Welfare. Amongst the many problems dealt with by the citizens' advice bureaux few were less easy of solution than those of old people. Many of them were made homeless by enemy action, many were left stranded in London and the big cities when their sons and daughters were transferred to other districts for munition work or evacuated to the country. The administration of supplementary pensions to old age pensioners undertaken by the assistance board revealed the many needs of lonely old people. At the suggestion of the board the National Council of Social Service set up a committee to co-ordinate and extend work for the welfare of the aged. Old people's welfare committees were set up in the provinces and a register of homes for the aged was compiled.

Youth Work. With the introduction of the service of youth scheme in 1939 the board of education took a new share in the development of youth activities through the setting up of a national youth committee and the encouragement of local youth committees set up by local authorities. All the 146 higher education authorities in the country by 1941 had formed youth committees, many of them representative of voluntary bodies as well as educational interests. Policy showed two tendencies (1) to strengthen the work of existing youth organizations by grants in aid and (2) by the setting up of new youth centres where activities for the 14–20 age group were specially fostered. While the majority of schemes were set on foot through local youth committees, the board could assist individual clubs and usually did so on the recommendations of one of the established national youth organizations. Clubs of all kinds were accordingly developing—rural clubs, mixed clubs, old scholars' clubs, as well as the usual boys' and girls' clubs and the uniformed organizations. Mixed activities were more and more common both in these and in the new war workers' clubs for young adults, financed by the ministry of labour and organized by such bodies as the Y.W.C.A. and the National Association of Girls' Clubs, and other voluntary organizations.

At the younger end, war conditions and the desire to serve found expression in youth service squads which undertook numberless services from salvage collection to messenger work for the civil defence services. Later, existing pre-service training schemes were expanded through cadet corps. This was followed by a number of training schemes for girls which were co-ordinated through a national voluntary committee.

Other Welfare Services. It would be impossible to enumerate even briefly, in the scope of this article, the war-time developments in provision for the economic welfare of serving men and women and their dependants, for war orphans, for the aftercare and training of the disabled and for the appointment of almoners in all emergency hospitals for after-care work.

Other tendencies of social welfare in 1941 included the growth of regionalization typified by the appointments of regional welfare officers of the ministry of health, the earlier ones of regional officers of the National Council of Social Service and regional administrators of the W.V.S. There was, too, the increasing employment of social workers by government departments and local authorities. There was a growth of co-operation between the state and national and local voluntary bodies. This last showed a diverse pattern. It might include a ministry of supply hostel built and equipped by the ministry and staffed and run by voluntary bodies, a communal feeding scheme organized by voluntary institutions on behalf of the ministry of food, and the whole range of services covered by countless women's organizations and the W.V.S. (M. L. H.)

WAR FINANCE. The most outstanding fact in war finance in the third year of war was the large increase in national expenditures. This may be illustrated from the budgets of the countries concerned, or by expressing the expenditures as percentages of the net national income; when national expenditure is expressed as a percentage of the national income, it must be borne in mind that part of the expenditure is from capital or dissaving. In Great Britain, the percentage of expenditure (national and local) to national income in 1941–42 was about 67 per cent as compared with 59 per cent in 1940–41, and 31 per cent in 1938–39. Of this total expenditure, the share of war or

Keystone]
LONDON'S WAR WEAPONS WEEK IN MAY 1941. A MESSERSCHMITT 109 ON SHOW IN TRAFALGAR SQUARE

defence was 51 per cent, 42 per cent, and 9 per cent, respectively. In Germany, the figures were much higher ; it is not possible to calculate the percentages because expenditure figures were not available, but a statement was issued during the year for propaganda purposes to the effect that public expenditure, including municipal expenditure, in 1938 was 42 per cent, in 1939 53 per cent, and in 1940 70 per cent. In 1941, on this basis, the expenditure would be well over the 1940 figure. Expenditure, it may be noted, was increasing in the Reich at a much faster rate than revenue. In the United States, government expenditure (national, state and local) was 29 per cent in 1938–39, 28 per cent in 1940–41, and 46 per cent in 1941–42, and of this 2 per cent, 7 per cent, and 27 per cent, respectively was defence or war expenditure. These figures are striking because they show that as war proceeds, the national economy of the nations concerned is turned over, at the expense of the people, more and more, to the production of munitions. In peace time, governments are attempting to increase the standard of living of all. In war, the contrary is aimed at. The restriction of consumption is not the unfortunate by-product of war finance ; it is and must be the deliberate object of war finance. The expansion of the resources devoted to war is the same thing as the compression to the minimum of those resources retained for the consumption of the people. This transfer of resources was being achieved mainly by four methods : (1) taxation, (2) borrowing or the utilization of savings, (3) a combination of taxation and borrowing, and (4) inflation. Rationing may also be said to be a method by which consumption is reduced, making available for the use of the government what would otherwise have been devoted to consumption. In Germany, for example, with the exception of potatoes, amusements and books, practically everything was rationed. The result was that with full employment and considerable over-time and no means of spending, savings were swept into government coffers. The limitation of consumption is also possible by directly limiting the amount of goods produced for civilian use.

By inflation is meant an increase in the general price level as a result of an increase in the public's spending power, due to increased government expenditures, while goods available for purchase are not correspondingly increased in amount. While taxation and loans take money out of the pockets of the people before they can spend it, inflation permits them to spend as much as before but ensures they get much less for their money. Prices under inflation, whether money is printed by the government or borrowed from the central bank or other banks, and paid out by the government for wages or materials, rise as a result of the competition between the government and the general public for the purchase of goods and services required for the conduct of the war. The government with its unlimited resources ultimately outbids the consumer. It is obvious how unsatisfactory inflation is compared with taxation, by which every pound which the government spends is withdrawn from the public's income according to an agreed plan and not surreptitiously by the inflation of prices.

The belligerent countries have not all followed the same policy as regards the combination of taxation and borrowing. In Great Britain, the policy has been to tax to the utmost and to meet the remainder from loans. Some of this taxation was deliberately levied to stop consumption of goods in order to set free income for government purposes. Up to the beginning of 1942 this had not been successful ; the consumption of both alcohol and tobacco much exceeded the estimates in the 1941–42 budget, and the rate of release of sugar had also been increased ; the yield of the purchase tax was well above the budgeted figure.

The large extent of borrowings in the third year of the war is distinctive among all the belligerents—in some more than in others. In the last war, Germany financed her effort mainly by loans, in this war she is following the example of Great Britain and the United States by using taxation and borrowing. Secretary of State Reinhardt has announced that the national debt of the Reich had increased to Rm. 90,000 millions by March 1941. This was an increase of, roughly, Rm. 40,000 millions during the financial year 1940–41. In other words, the Reich had at its disposal in 1940–41 the sum of Rm. 76,000 millions from revenue, administrative fees, war contributions of local authorities, payment for occupation costs, and borrowed capital, which at the rate of Rm. 12 to the pound, works out at £6,300 millions. At the beginning of 1942 the Reich was spending much more than this figure. In Great Britain, an intensive drive for large and small savings was producing astounding results. In the second year of the war, ending November 1941, £633,262,731 were in the form of national small savings, as compared with £484,043,000 in the first year. Savings, both large and small, form the loan money which must increase with the intensive effort of the national savings campaign. During the financial year 1940–41, the national debt increased from £8,411,221,301 to £10,872,241,552—an increase of £2,461,020,651.

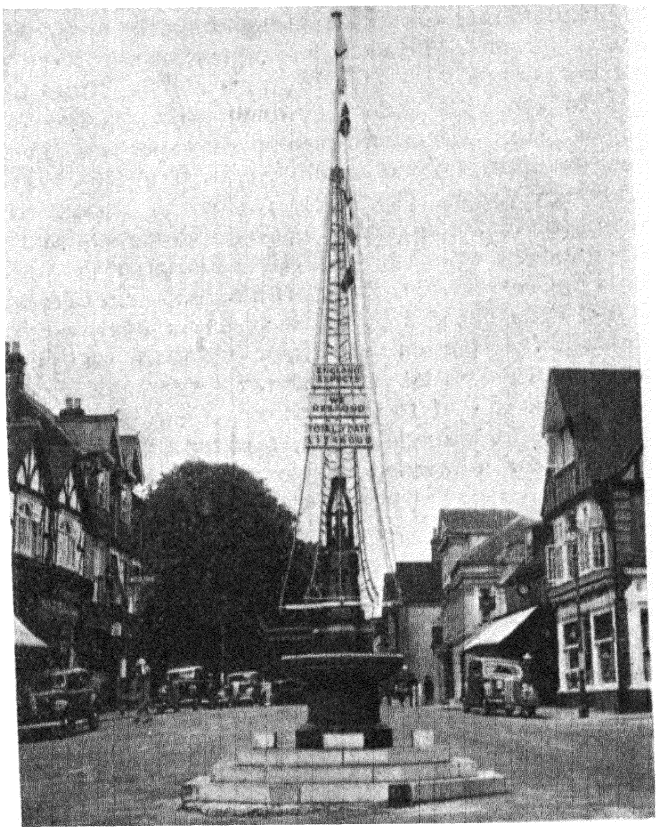
The real object of war economics is to mobilize men and materials with the utmost efficiency and with the least possible delay to win the war. Finance in war time ought not to be the controlling factor. The main functions of money in war economics are positive and negative ; the positive function is to see that the burden is distributed fairly, the negative function is that nothing should be decided on purely financial grounds. This does not mean that the control of expenditure should be neglected, and that audit is superfluous. Far from it. Control and audit see that the money is spent efficiently and in the way intended. When we say that finance in war time should not be the controlling factor, all we mean is that it should not be allowed to impede the solution of the physical problem. And it must be admitted that from this viewpoint the British war time finance system is far from perfect. For financial considerations to hold up the right solution of

military problems is bad, but for financial considerations to dictate a wrong solution is much worse. Finance cannot contribute much to the actual winning of the war, but it can see that the burden is spread with equity and that the war is won with the minimum of disturbance to society.

The choice between paying for the war from taxation or from loans, or from both, is sometimes misunderstood. How often we hear it said that by borrowing instead of taxing, we are placing the burden on posterity! This, however, is not true. It is clear that by borrowing rather than by taxing, the government relieves those actually living and working today from paying taxes only to the extent that it takes from them by way of loans money which belongs to them, thus equally depriving them of current spending power. All that borrowing, in preference to taxation, does is to place on future generations a technical problem, that of taking money from the pocket of the taxpayer and putting it in the pocket of the debt-holder. Both are members of the same society and both are often the same person. This does not impose a real burden on the community as a whole, just as the process of raising a loan does not relieve a community of its real burden, which is a current effort and cannot be put, save with three exceptions, on the past or the future. If a community borrows from abroad, it obtains additional resources in the form of aeroplanes and other munitions of war. It has to make a future deduction from its resources when it pays interest or repays capital. When drawing on investments, it also increases its present resources but at the expense of having less in the future. In the present war, Great Britain was drawing on her investments in the United States to pay for goods imported. In August 1939, her gold and dollar resources were $4,483 millions, but on September 1, 1941, this had fallen to $697 millions. At home, the most important factor in domestic dis-investment was the non-replacement of trading stocks which were falling to rock-bottom levels.

The third exception, namely, the failure to keep in good repair capital in the form of machinery, etc., leaves for the future the making good of the deficiencies arising from not allowing for depreciation. The rule, however, in spite of these exceptions, is that the real burden of the war is on those who are compelled to do without the goods and services which they would have enjoyed had not these been made over to the production of munitions. Sacrifice, in short, is borne by those living at the present time, who must provide the men and materials needed to prosecute the war in 1942.

Great Britain. The fourth war budget was presented to the House of Commons on April 7, 1941, and was the nearest approach since the war to what a war budget should be. It added several million to the number of income tax payers, raised the rate of direct taxation on the highest incomes to 19*s.* 6*d.* in the £, and above everything else aimed at the prevention of inflation. The real menace in war finance, as already shown, is the gap between revenue (including the borrowing of real savings and other assets) at home, and expenditure at home. The chancellor of the exchequer indicated that it would be misleading to take account of expenditure abroad, especially since the Lend-Lease Act had been passed in the United States. In the first 18 months of war, government expenditure was £4,650,000,000, while taxation was £2,000,000,000, overseas resources £1,000,000,000, and the balance of £1,650,000,000 was made up of substantial current receipts of certain extra-



Fox Photos]

THE NATIONAL SAVINGS CAMPAIGN: ONE TOWN'S INDICATOR SHOWING ITS TOTAL, IN THE FORM OF A SHIPMAST FLYING NELSON'S FAMOUS SIGNAL

budgetary funds, mainly the unemployment fund and funds of the government insurance schemes. In addition, the government had the advantage of large sums available for investment since the normal sums to make good depreciation, renewals of buildings and plant and repairs, were greater than was required. Most important of all were the new savings obtained by the national savings movement and other genuine savings seeking investment in government funds. The chancellor framed a budget estimate for expenditure of only £4,207,000,000 for 1941–42, although he indicated that the total war effort represented expenditure far beyond £5,000,000,000. He summarized the financial policy of the government as control of the torrent of excess purchasing power fed by the springs of war time government expenditure. Revenue he estimated at over £1,786,000,000. The corresponding figures for 1940–41 were expenditure £3,884,000,000 and revenue £1,409,000,000. The figures of expenditure in these two years are not strictly comparable, as those for 1941–42 exclude the values of supplies received under the Lend-Lease Act and payments made to the United States, for existing orders at the time of the presentation of the budget.

It is on the revenue side that the budget is of special interest. The whole of the additional money required by taxation was to come from income tax, £150,000,000 in 1941–42 and £250,000,000 in a full year. The chancellor assumed an increase of between £200 and £300 millions in personal savings, and this, added to the new taxation, would bridge the prospective gap of £500 millions. This gap was obtained as follows: purely domestic expenditure (which is vital for the handling of the problem of inflation) he gave as £3,700,000,000. Revenue on the 1940–41 basis was estimated at £1,636,000,000 and the other offsets at £1,522,000,000, a total of £3,158,000,000 or a gap of

£542,000,000. Income tax was increased by 1*s.* 6*d.*, making the standard rate 10*s.* in the £ (6*s.* 6*d.* on the first £165 of taxable income). Personal allowances were reduced for married persons from £170 to £140, and for others from £100 to £80. The exemption limit was reduced from £120 to £110. The earned income allowance was reduced from one-sixth (maximum allowance £250) to one-tenth (maximum £150). The extra tax which anyone paid because of the reduction of personal allowances and of earned income was to be credited to him after the war in the Post Office Savings Bank, with a maximum allowance of £65. The changes in the income tax increased considerably the burden of direct taxation on middle incomes. The amount of income tax, for example, reached the effective rate of 10 per cent on an earned income as low as £140 for a single person, £250 for a married couple and £400 for a married couple with two children. It reached 20 per cent at just over £250, at £400 and at £600 for these cases. There would be more than 3,000,000 income tax payers in 1942 who have never paid income tax before.

The most important single proposal in the budget was the stabilization by subsidy, where necessary, of the prices of all the essential goods entering into the cost of living and also the cost of essential services such as coal, gas and electricity. It was a bold step to assume a liability of which the amount could not be estimated with even approximate accuracy. It was, however, essential if wages were to be stabilized. The aim was to prevent any further rise of the cost of living index number above the then range—25 to 30 per cent above the pre-war level. During 1941–42, food subsidies amounted to about £120 millions. The main groups of subsidized foods were cereals, including flour, bread, oatmeal, milk, tea, eggs and potatoes. The price of food was affected by the subsidies of about £5 millions on the transport of coal and by whatever emerged from the government's agreement with the railway companies. The contribution which the exchequer was making in keeping the cost of living stabilized ensured greater benefits, especially to the poorest section of the workers, than could be obtained by any other measure. It was another proof of the determination of the government to wage battle against inflation.

The budget returns of the nine months of the financial year, i.e., to December 31, 1941, show that in spite of the desire of the chancellor of the exchequer to put the national economy into a strait-jacket he was not altogether successful. Expenditure on consumption goods was still far too general and widespread. The consumption of alcohol and tobacco was high and it is known that the yield of the purchase tax had much exceeded expectation. The budgeted increase for the whole year under customs and excise was £48 millions, but for the nine months an increase of £144 millions had already been realized. During the last six months of 1941 a study of the growth of bank deposits and the circulation of notes shows that money incomes increased sharply. More taxation to curb spending would appear to be called for either in the form of a higher income tax, an excess income tax over, say, the pre-war year or the pre-rearmament year (1937–38) or heavier consumption taxation on goods and services. A greater campaign to obtain savings for war purposes is also necessary. So far inflation had been moderate, not more than 20 per cent after two years of war.[1] Consumption goods were scarce as there was not enough man-power to make more, and there were not enough ships to bring them to the country. As Mr. Keynes stated in December, the total amount which could be bought in the shops and spent on rent, light, fuel, travelling, entertainment and all else was a fixed amount, about £12 millions a day at the prices then ruling. Personal wages and other incomes before income tax was paid were of the order of £16 millions a day. The excess of £4 millions a day must not be spent. Personal savings were £2 millions a day and it covered only half the gap. The remainder of the balance, £2 millions a day, still remained to be drawn off by income tax, and by more intensive saving. Even if this were not done the public could buy no more goods than they were buying then.

The future burden of the national debt is a question that has arisen from time to time since the outbreak of war.[1] On March 31, 1941, the total deadweight debt was £11,513,000,000, the highest in the history of the country. From 1919 until 1938 the total stood at the level of £7,000,000,000. The increase of £2,467,000,000 during the fiscal year 1940–41 was mainly due to a large increase in treasury bills outstanding (£2,212,000,000) and to the issue of loans for the war. On the supposition that prices are kept down during the war and are kept up after the war, and that the average rates of interest do not exceed those of the years 1932–38, the burden will not be great. If the war lasts as long as the last war the net increase in the principal of the national debt is not likely to be more than £10,000 millions. The average rate now being paid is 2 per cent and at this rate the annual cost will be £200 millions a year. This is the gross figure and should be reduced by the amount of tax levied on the interest payments. The net burden is estimated at less than £150 millions. If the post-war price level is that of 1936, then an increase of one-sixth in the rates of taxation, i.e., an income tax of 5*s.* 6*d.* in the £ only will be required. An increase of 20 to 25 per cent above the 1936 price level would solve the problem.

Canada. The year 1941–42 was an *annus mirabilis* for Canada. Canada had raised forces greater in number than those raised by the summer of 1916; in addition, there had been enormous industrial expansion which made the production of munitions beyond comparison with those of 25 years ago. Effective machinery had been set up for preventing unnecessary expenditure abroad, for restricting the supply of luxuries, for collecting direct taxes from at least one-fifth of the whole population. Prices, wages, and rents were controlled in this year of pronounced progress. Domestic prices were not allowed to exceed the maxima charged between September 15 and October 11, 1941. Basic wage rates had been stabilized in relation to the general price level throughout industry, with certain exceptions, by a cost of living bonus subject to periodic revision. These measures put a brake on the possibility of inflation. It may, in the future, be necessary to restrict production and the sale of goods unessential to the war effort unless the government can obtain borrowings in sufficient amount from actual savings. Canadians may, with justification, take pride in what has been accomplished. The expenditures of the Dominion government, including the assistance given to the United Kingdom, but excluding all provincial and municipal expenditures, would in 1941–42 amount to nearly 50 per cent of the national income. Before the war, it was estimated that government—federal, provincial and municipal—spent 25 per cent to 30 per cent.

[1] Cf. "Types of War Inflation"—A. C. Pigon, *Economic Journal*, December 1941.

[1] Cf. "The Future Debt Burden"—*The Economist*, August 16 and 23, 1941.

Government expenditure was estimated at more than $2,800,000,000; of which about $1,450,000,000 was the estimated direct war expenditure; $470,000,000 was provided for non-war expenditure, and $900,000,000 for the estimated cost of munitions for Great Britain. Tax revenue was expected to yield $1,400,000,000, so that approximately 75 per cent of expenditures would be met from current revenue, leaving the sum of $1,250,000,000 to be found by borrowings.

The federal budget provided for a considerable increase in taxation. Since the outbreak of war, the taxes on tobacco, malt, carbonic acid (for soft drinks), cosmetics, sugar, motor cars and similar commodities, have been raised, and a war exchange tax of 10 per cent placed on imports. The personal income tax has been raised three times, so that it is now quite severe on the intermediate incomes ($2,000 to $10,000). A national defence tax of 5 per cent has been imposed on single people with incomes between $660 and $1,200, and of 7 per cent on incomes over $1,200; on married persons with incomes of $1,200 the rate is 5 per cent. The corporate income tax was raised to 18 per cent and an excess profits tax imposed, so that 75 per cent of excess profits over the basic years is taken. The Dominion has also invaded the succession duty field with a moderate levy superimposed on the existing provincial duties. New taxes have been placed on amusements, and a duty of 3 cents per gallon on petrol or gasoline, both of which were previously provincial fields. The burden of the personal income tax is considerably heavier on the middle classes than hitherto. Agricultural income, however, has been practically untouched in the war taxation; although agricultural incomes have not much increased the agriculturists are relatively better off than before 1939. Considerable re-distribution of income is taking place, a re-distribution which will have considerable social effects.

The bulk of the increase in the national income has gone to re-employed persons and to young persons employed for the first time, whose taxable capacity is not high. Employment has reached a record level. Half of the workers employed by the Canadian manufacturing industries are directly engaged in munition work and war contracts exceed $2,500,000,000. In shipyards, for example, 20,000 workers are engaged, as compared with only 1,500 men at the outbreak of war. Aircraft factory floor space has increased seven times, and workers from 2,300 to 32,000. With full employment approaching, it may be necessary for the government to curtail civilian production. Another factor which has enabled Canada to maintain her civilian consumption, apart from unemployed resources, is the supplies from the United States, which has been a deep reservoir. The war, it may be noted, has aggravated the tendency for Canada to pile up debit balances with the United States and a credit balance with Great Britain. The shortage of dollar exchange has been met in three ways: (1) the import of American goods and services has been reduced by taxation, by import duties and embargoes, and by the ban on free travel in the United States; (2) the American component in goods purchased for Great Britain has been supplied to Canada on lend-lease terms, and (3) the United States has also been purchasing from Canada munitions which the latter is able to produce in large quantities.

A considerable part of the borrowings of Canada are the result of supplies to Great Britain for the winning of the war. The United Kingdom has been in need of Canadian dollars as well as American dollars. At first, down to the end of 1940, the British need for dollars was met by sales of British assets in Canada (40 per cent), by Canadian accumulation of sterling (i.e., short term loans to the British government) 20 per cent and the remainder (40 per cent) by the shipment of gold. The second phase was the accumulation of sterling which marked the year 1941. Canada took payment in sterling which accumulated in London and was invested mainly in treasury bills or other floating debt. At the end of January 1942 a third phase began. Sterling had accumulated to $700 millions (£160,000,000). It was agreed that $295 millions, the proceeds of Canadian securities belonging to residents in the United Kingdom, should be mobilized and used not in the reduction of debt but to pay for further purchases. The $700 millions is to be lent—the question of the ultimate repayment and the rate of interest is to be left for decision after the war. Canada is to supply munitions of war, including foodstuffs up to an amount of $1,000 millions free, i.e., Canada makes a gift of $1,000 millions which is expected to last for a year. These are large figures when compared with Canada's total revenue.

The most interesting feature of Canada's war effort, to date, is that most of the increase in expenditures has been provided by an increased output, and to a less extent by drafts on capital, and only to a small extent by the reduction of consumption on the part of the public.

South Africa. In no part of the British Commonwealth was the financial position more satisfactory than in the Union of South Africa. The Union is, as is well-known, the chief source of gold production in the British Commonwealth. It is true that the passage of the Lend-Lease Act somewhat modified the urgency attached to the demand for gold. Nevertheless, the Union's gold production was still a most important source of purchasing power. It is not possible to say what happens to the gold but the most beneficial use of it is for providing for exchange. It is interesting to note that since the war began there has been an increase of 70 per cent in the holdings of the reserve bank. Like the other Dominions, South Africa had found it necessary to check inflation by means of price control and import restrictions, but the problem had been less strenuously tackled than in Canada and Australia. Rationing had been introduced for some goods, such as petrol, but the control of wages had been imposed only in a few industries such as the making of footwear, and the building industry. The cost of living had risen by only 9 or 10 per cent in spite of a rise of nearly 40 per cent in import prices. The inflationary danger was that war expenditure was being financed by surplus gold rather than by genuine savings. It is desirable that surplus funds should be mopped up by government loans and utilized for the repatriation of external debt, which has been taking place on a considerable scale over the last two years. General activity prevailed not only in the monetary sphere but in commerce and industry. The engineering workshops of the mines and railways have been turned into arsenals. The Iron and Steel Corporation, known as "Iscor," and other engineering firms, textile, clothing, boot and furniture factories, not to mention the canning industry, have been harnessed to war production and over 600 factories are engaged on the production of war supplies. Overtime was being regularly worked, and earnings showed a considerable increase. Mines have been the mainstay of the Union's economic position and during the year 1941 a new high record of production was reached, namely, 14,386,361 oz. of gold valued at £120,845,114,

compared with 14,037,741 oz. of gold valued at £117,917,024 in 1940. Owing to the increase in working costs and severe taxation, the industry showed a decline in actual profits.

In the budget for the year ending March 31, 1943, introduced in February 1942, the government proposed to spend £139,855,000, of which £95,500,000 would be from current income. Mr. Hofmeyr budgeted for a deficit for 1942–43 of £210,577. £80,000,000 would be spent on defence in 1942–43, as compared with £72,000,000 in 1941–42. £40,000,000 would be provided from revenue and the other half from borrowing. The normal gold mines tax was to be unchanged, but the gold mines special contributions tax was to be raised to 20 per cent, which would yield an additional amount of £1,540,000.

The excess profits tax would remain at 13*s.* 4*d.* in the £, but a new tax would be instituted to be called the trade profits special levy. This would be levied on the difference between (*a*) the amount of assessed profits on which the excess profits duty was payable by the taxpayer, having regard to the pre-war standard based on profits, and (*b*) the amount on which such duty would be payable by the taxpayer with a like income but with the minimum pre-war standard. This levy was estimated to produce £4,000,000.

The finance minister also announced variations in the normal and supertax on individuals, including a compulsory saving scheme, and a surcharge of 10 per cent on all income tax payments by individuals, which was estimated to yield £1,550,000. As a war-time measure he announced the further institution of a land sales profit tax, which was estimated to produce £450,000.

Australia. The tale of war finance in the financial year which ends on June 30, 1942, can be briefly told. During the early part of the year there was some hesitation to admit the full logic of the economic necessities of war. Gradually, however, as time went on, it was realized that surplus purchasing power must be skimmed off and that the economy of the nation must be put into a strait-jacket. This can best be illustrated by referring to the major financial facts of the year. On June 27, 1941, the Loan Council met at Canberra to discuss the Commonwealth government's proposals. It was clear that the Australian war effort would involve an increase in the war expenditure of the Commonwealth from £A.80,000,000 to £A.250,000,000 in the coming financial year. The federal treasurer, Mr. Fadden, told the Council that the Commonwealth government foresaw a gap of £A.60,000,000, and that it must make very heavy demands on the taxpayer, and that its demands must take precedence over those of the States. He stated that the States were requested to cease levying income tax for the duration of the war, and instead accept a grant from the federal treasury. The difficulty arose because the amounts levied in State income tax are in some cases very high. The taxpayer in Queensland, for example, had to pay to the State treasurer more than twice as much as a taxpayer earning the same income in Victoria. The controversy resulted in a decision against the proposal. All the State premiers except the premier of South Australia opposed the proposal. When the budget for 1941–42 was introduced on September 25, 1941, Mr. Curtin, leader of the Opposition, indicated that there was fundamental divergence of opinion between Mr. Fadden's Coalition government (the United Australian Party and the Country Party) and the Labour Party. The Labour Party objected to the proposed compulsory loan on the grounds that it would dry up the source of war savings certificates. Mr. Curtin made a frontal attack on the whole plan to extend direct taxation to the smaller incomes (down to £A.150) and he denounced as ungenerous the government's treatment of Service men and their dependents. On the resignation of Mr. Fadden's government, Mr. Curtin's budget was introduced in October; its real feature was the scaling down of the amount provided by new taxes, and an increase in the amount to be covered by new borrowings. Only £A.22,000,000 was to be found from new taxes against £A.32,000,000 under the Fadden budget; £A.138,000,000 was to be borrowed in place of £A.122,000,000. The Australian fighting man was given a substantial increase in his pay, and especially in the form of an allowance for his dependents. There were increases in old age and service pensions. Instead of bringing in those with incomes under £A.200, the new budget took more from those whose incomes exceed £A.1,500, at the same time restricting the exemptions and allowances at all levels. The sliding scale so operates that all incomes over £A.2,500 (or £A.2,000 in the case of revenue from property) pay 16*s.* 8*d.* in the £. The new government implemented certain recommendations made by the Royal Commission on the monetary and banking system of the Commonwealth, "to bring the operation of the trade banks under effective control," publishing regulations for the control of banking operations under the National Security Act in November 1941. The new government, like its predecessor, set its face against inflation through banking channels. As a result of the policy of the Commonwealth bank, advances were limited to the essential needs of war production.

In December 1941, after the extension of the war to the Pacific, more stringent methods were adopted. A special war-time tax on individual incomes was passed by the federal parliament on Dec. 17, and came into force immediately. It tapped a new income field embracing hundreds of thousands of wage-earners. The tax was to be on the actual income less the amount assessed on that income for ordinary federal income tax. It commences at 6*d.* in the £ on incomes of £156 per annum, rising by one quarter of a penny in the £ for every £6 until it reaches 1*s.* in the £ on incomes of £300, when it is stabilized at that rate. A rebate of tax of 1*s.* per week for a wife and for each child is allowed. Military pay under £200 per annum is exempt from this tax and dependents' allowances are exempt from both the new tax as well as the federal income tax. A supertax of 1*s.* in the £ was imposed on company profits, making the company tax 4*s.* instead of 3*s.* in the £. These increases were estimated to bring in in a full year £27 millions.

In February 1942, Mr. Curtin announced that the war cabinet had decided to carry out far-reaching measures designed to accelerate the marshalling of the national resources behind the war effort. Like Canada, Australia then decided to adopt the policy of price and wage stabilization. It was a comprehensive plan to keep prices of all goods, services and wages at the existing levels. Profits were to be pegged at a maximum of 4 per cent; interest rates were to be controlled and the sale or investment of capital except under government licence or for obvious war purposes was prohibited. Nothing was said about rationing, which would appear to be a necessary complement to the pegging of prices and wages; in August 1941, for example, the value of retail sales in Melbourne had increased by 45 per cent, and in Sydney by 35 per cent, as compared with the value of sales at the beginning of the war, and these rises were much greater than could be

attributed to any upward movement of prices. The government also decided to require employers to obtain labour through the labour bureaux, and the dismissal of employees in federal industries was prohibited, as was any change of occupation or employer without federal approval. Persons engaged in industry were forbidden to absent themselves from work for reasons other than sickness or recreational leave, and those illegally absent were to be subject to drastic penalties. The government may take power to put any area under military control in an emergency, and this includes acute industrial trouble. Speculation in commodities such as forward dealing in foodstuffs and other essentials was also prohibited.

New Zealand. The second war-time budget of Mr. Nash, the New Zealand finance minister, showed a large increase in war expenditure. The estimated war expenditure was £NZ 69,700,000, which is £NZ 42,500,000 more than was spent in the previous year 1940–41. It was expected that £NZ 31,000,000 of this would be spent overseas and would be met from advances made by the British government, the remainder being raised and spent in New Zealand. Although £NZ 31,000,000 was to be financed as a loan by the United Kingdom, New Zealand proposed to pay the advance to the full extent that sterling funds permit. Of the £NZ 40,000,000 to be spent in New Zealand, taxation was to provide £NZ 19,346,000, loans £NZ 13,000,000 and cash balances and transfers from the civil budget £NZ 7,654,000. In the civil budget revenue was estimated at £NZ 39,296,000, and expenditure, excluding transfers of war funds, at £NZ 37,712,000. On both sides of the civil budget there was a fall of £NZ 1,000,000 below the corresponding figures of the previous year. No new taxes were imposed as the government recognized the limit to the possibilities of increased taxation and the necessity of avoiding killing the goose that lays the golden egg. The only new expenditure proposed was for additional social security benefits for families with low incomes, invalids, and war veterans. This expenditure for social security benefits was estimated at £NZ 14,673,000.

Another interesting feature of the budget was the amendment of the system of taxing the trading banks in the Dominion, so as to make them liable for social and national security and income taxation only on the actual income earned in New Zealand. For more than 40 years New Zealand bankers have pressed for a change in the method of tax assessment, and with a rising rate of taxation and falling earning power, the incidence of banking taxation under this system had become almost crippling. As in Australia, public works programmes were reduced, but provision for essential national development amounted to £NZ 20,615,000 including £NZ 12,950,000 from loans. The government social expenditure prior to the war has had much the same effect as war expenditure. The recent rapid rise, however, in the latter has diminished the rate of advance in the former. National income, it may be added, has increased as a result of the war, the main beneficiaries being the wage earning classes.

India. During the year India made vast strides in the production of war materials, supplying the Middle East as well as the Far East with as many as 40,000 different kinds of munitions. The effect of the war on Indian finance has been very great but it does not show the entire war effort of the Indian empire. Expenditure on defence in the year 1942–43 will be Rs.133 crores,[1] three times more than similar expenditure before the war. The Indian defence estimates covered only the cost of local defence. The amount of expenditure, for example, that the government of India will spend on defence services and supplies that they will recover from the British government under the financial settlement between the two countries will exceed Rs. 400 crores (£300,000,000) in 1942–43. The total budget expenditure is estimated at Rs. 187 crores 7 lakhs. Revenue at existing levels of taxation when the budget was presented on February 28, is estimated at Rs. 140 crores. There is thus a deficit of over Rs. 47 crores. To meet this Rs. 12 crores will be raised by new taxation and Rs. 35 crores by borrowing.

In direct taxation it is proposed to (1) make incomes between Rs. 1,000 and Rs. 2,000 liable to taxation, but the liability may be discharged if the person assessed deposits one and a quarter times the amount of tax in defence savings, which will be repayable with interest at 2½ per cent one year after the war; (2) increase the present surcharge of income on a graduated scale; (3) retain the excess profits tax at the existing rate of 66⅔ per cent but the government will contribute up to one-tenth of the tax paid to a reserve for re-equipment of industry after the war, provided the assessed person doubles the amount. The assessee's deposit will be repayable within twelve months after the end of the war and will earn 2 per cent simple interest. In indirect taxation there will be an emergency surcharge of one-fifth on all customs import duties except petrol, the tax on which is increased from 12 to 15 annas a gallon, raw cotton, on which the duty is doubled, and specified imports from Burma which are excluded. There is no change in the duty on salt but the excise duty on kerosene has been raised to the level of the increased import duty. Minor increases have been made in post and telegraph rates.

The most interesting point in the budget is perhaps the sterling debt repatriation which has taken place, consequent on the piling up of sterling balances in London. The total sterling debt has been reduced by £101,600,000 and the annual interest payments in sterling by more than £4,000,000. In 1942–43 further repatriation of overseas debt will take place. Another feature of considerable interest to the Provinces is the fact that Rs. 8 crores 37 lakhs will be their share of the income tax, and as Sir Jeremy Raisman, the finance member, said: "This is considerably more than the total sum which, at the time of the Niemeyer Award, the Provinces were expected to receive at the end of the ten-year devolution period or than ever appeared to be possible before the outbreak of war."

Germany. In 1941–42 revenue was estimated at Rm. 32,000 millions against Rm. 27,200 millions in 1940–41, an increase of nearly 18 per cent. To this should be added the war contributions of the communes plus the charges levied on the occupied countries which should bring in some Rm. 13,000 millions—a total revenue of Rm. 45,000 millions. If borrowing continued at the same rate, the total available for public expenditure should be of the order of Rm. 90,000 millions. In short, revenue, borrowing and foreign tribute will exceed four-fifths of the gross national income of Greater Germany, a very high proportion. It was, however, necessary to "steer" purchasing power by taxation and by systematic saving more than ever before. The pressure of excess purchasing power in 1941–42 made an increase in taxation necessary despite the fact that the revenue from taxes was already buoyant. The surcharge on cigarettes, cigars and tobacco was raised from 20 per cent to 50 per cent of the retail price while the war duty on brandy was

[1] Rs. 1 crore as Rs. 10,000,000 = £750,000. Rs. 1 lakh = Rs. 100,000 = £7,500.

increased by Rm. 1 per litre and that on champagne by Rm. 1.50. There was no increase on the price of beer. Reinhardt, state secretary of the Reich finance ministry and the chief apologist of Nazi financial policy, told the press that the aim was to reduce consumption and to prevent inflation. The war surcharges on income tax levied after the outbreak of war had produced additional revenue but had differentiated against certain sections of the population. Income tax, the corporation tax and the turnover tax accounts for 70 per cent of the revenue. The yield from the Profit Stop tax proved to be less than 1 per cent of the total. The taxation of wages (which is important in any war tax structure) carries with it in the Reich (1) a minimum subsistence of 54 marks a month; (2) a free exemption of 52 marks a month of a married woman's wage (to encourage married women to go out to work); (3) an exemption for special overtime pay, i.e., not all overtime but only that beyond the maximum working hours fixed by the Trustees of Labour wherever such excess is authorized by the Trustees; and (4) an exemption of all savings including bonuses saved under the "Iron Savings Scheme." The wage earner may deduct a fixed amount up to Rm. 6 a week before paying the wage tax and this is credited to a special savings account, to be withdrawn twelve months after the war. The eight regular deductions (wages tax, war surcharge, civic tax, defence tax on men not conscripted, the three contributions for social insurance and the contributions to the Labour Front and Winter Help) were simplified by the amalgamation of the wages tax and the surcharge and by the suspension of the defence tax. "Iron Savings" were introduced because not until this year was the danger of inflation considered likely owing to the gap between the large amounts of unspent or unspendable money on the one hand and the decreasing supply of consumption goods on the other.

Next as to borrowing. From April 1933 to March 1941 Reich revenue was Rm. 119,200 millions and public debt Rm. 90,000. In 1941–42 there was a large increase in borrowing which indicates a further fall in civilian production and consumption in a national economy now in a strait-jacket. The limit of taxation is said to have been reached since the present level restrains higher production and efficiency. The problem of war finance in the Reich to-day is to place at the disposal of the Reich the additional purchasing power.

The occupied countries pay to the Reich over a fifth of their total national incomes, of which no part or at least a very small part is returned in the form of goods and services. Confiscation of state and private property in various forms amounts to a large sum. The effect of removing great stocks of goods against "promises to pay" is seen in the balance sheets of the central banks. Thus from April 1941 Germany financed her debts in the Netherlands through the Bank of the Netherlands and as a result this German indebtedness was in March 1942 the chief asset of the bank. As a corollary to this inflation of the bank's assets the note issue had greatly risen. German financial necessities were also being financed with the liquid balances left with the Dutch private banks owing to the decrease in stocks and the impossibility of investing these balances in industrial concerns. Exchange rates were manipulated by the overvaluation of the mark, which means that imports from the occupied countries were cheaper and exports to them earned a greater purchasing power over their products. Germany was buying from the occupied countries more than they would be normally prepared to sell and the price paid was from 15 to 40 per cent below that which would rule in a free market. Between one sixth and one quarter of the present war effort by Germany is probably the result of her exploitation of the countries overrun by her.

(G. F. S.)

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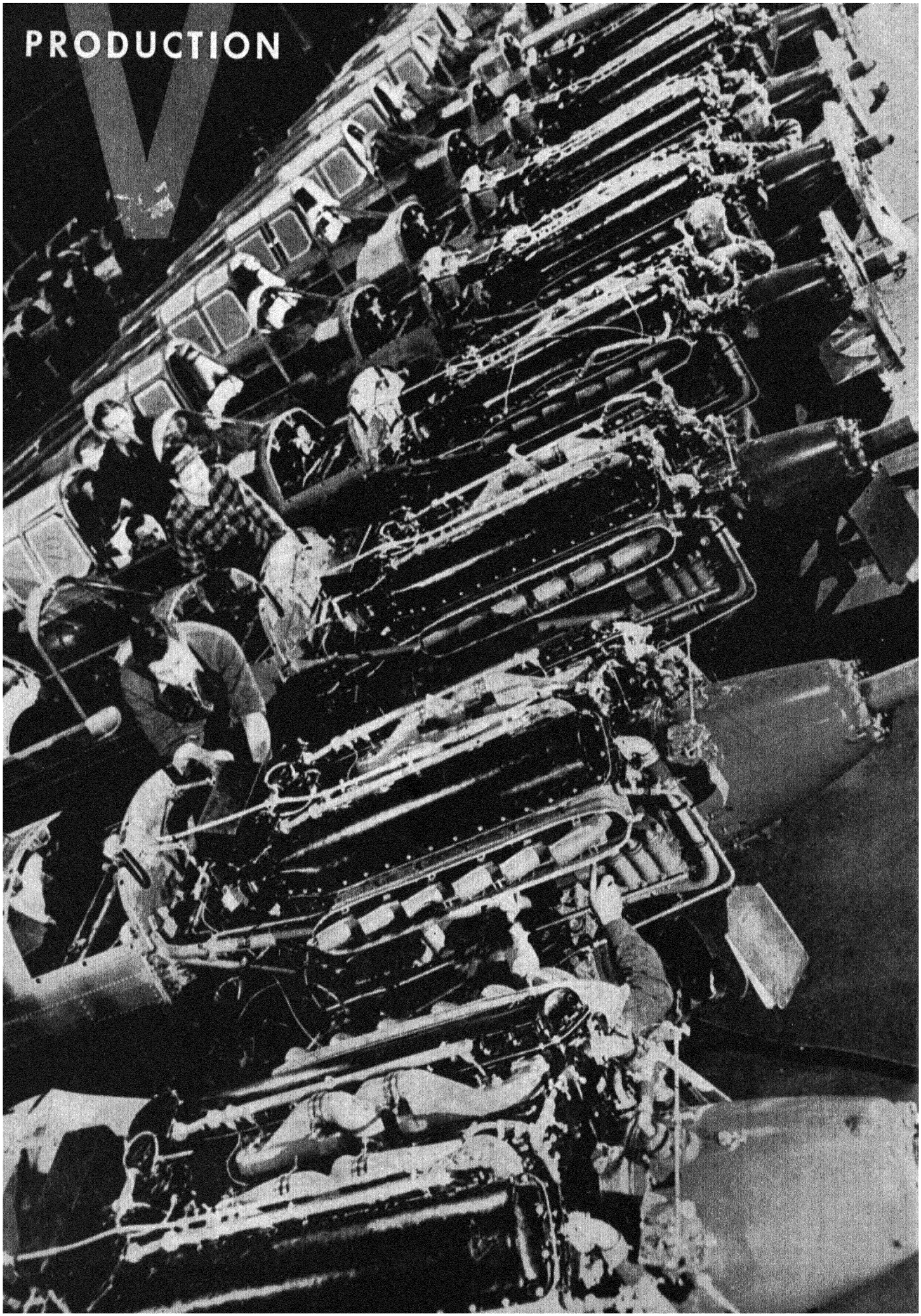

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THE EDITOR

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INTRODUCTION

THE first Britannica Book of the Year appeared five years ago when war seemed only a threat. Today the Book of the Year is presented to a world torn by men's hates and ingenuity's weapons of death. A record of the year of our Lord 1941 shows only a few small areas of the earth's surface where there is no war.

Many of the contributions which make up this volume have come from these fateful places and from the very men and women who are engaged in the vast battle toward peace. Again, as for previous volumes, many manuscripts, by plane and by ship, have won through to Chicago in spite of enemy vigilance—and not one manuscript has been lost! From Pearl Harbor, shortly after the Japanese surprise, a contribution arrived with a letter saying, ". . . . I wrote a little too much and cut it with a pencil. Please excuse this but inasmuch as I lost all my personal possessions, my typewriter, and my ship in the . . . . attack, you will understand. It may interest you to know that one of the files rescued was a water-soaked letter from you and my rough notes for the article. . . ." Here in this volume is the evidence of the folly of any man's assumption of superiority. Men can live peacefully only when they are well-tempered and humble. Those are fated for ultimate disaster who in their desperation dare to be dictators. The swollen arrogance of the Hitlers and the Mussolinis deflate, in the end, like any other balloon. Here in this volume is the evidence of final defeat for all such enemies of decency, understanding and kindness.

Although the world storms, books get published. One's gratitude must go to five hundred busy men and women who have found time to prepare these articles and to the members of Britannica's staff, who, working under pressure and the obvious emotional difficulties of the day, have kept earnestly and tirelessly at work—to Mr. John V. Dodge, assistant to the Editor; to Mrs. M. H. MacKay, who directed the organization of copy for the printer; to Mrs. Harriet Milburn, head proof-reader, and her colleagues; to Mrs. Ruth L. Breed, secretary to the Editor, who directed the preparation of the thousands of letters and telegrams and cablegrams necessary to bring the contributions from all corners of the available world. Most of all, one's gratitude must go to the publishers of Encyclopaedia Britannica, who by careful planning and wise direction have made possible the production of this annual volume.

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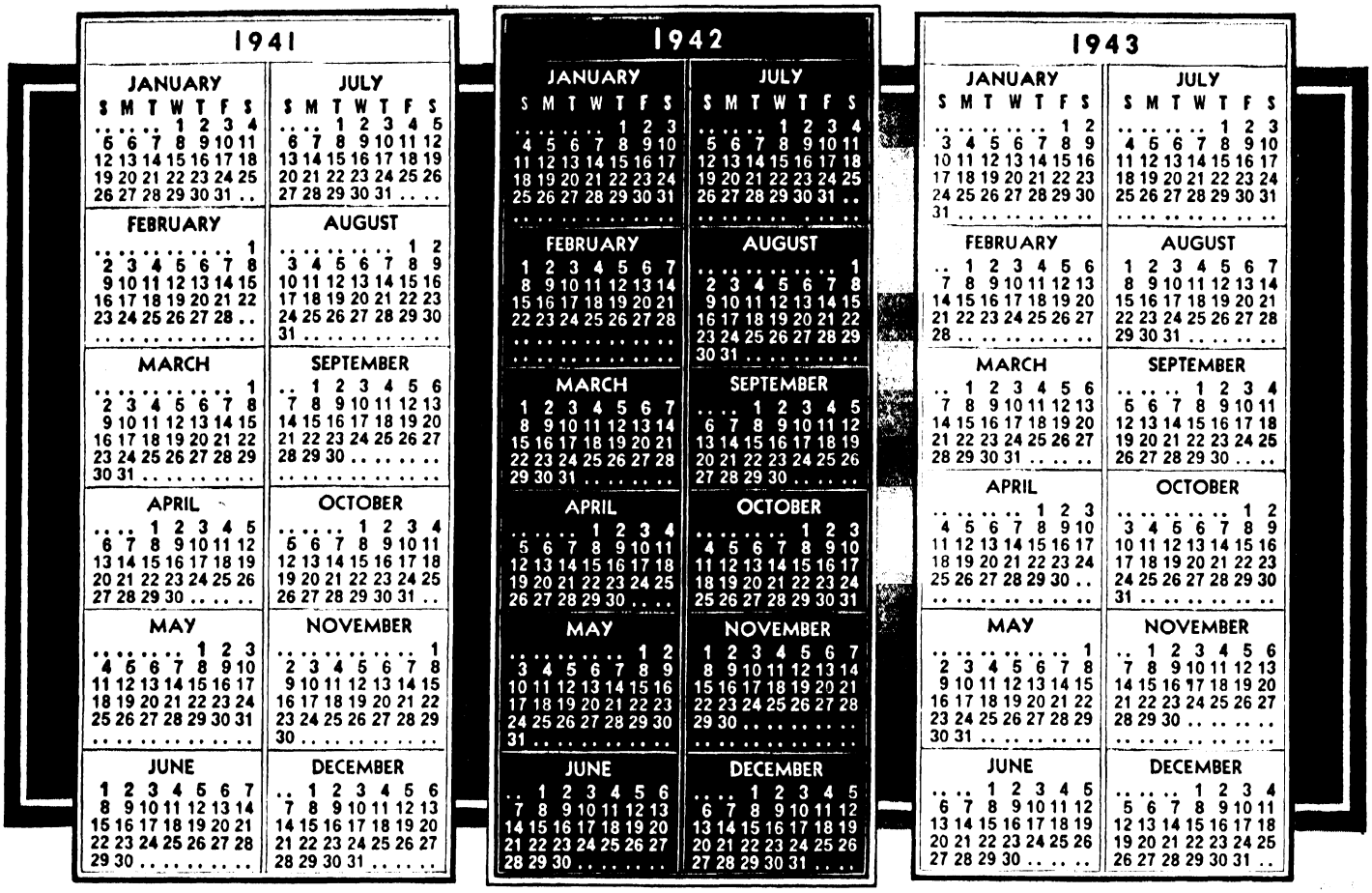
M.Do.	**MAURICE DOBB, M.A., Ph.D.** Lecturer in Economics, Cambridge University. Author of *Russian Economic Development since the Revolution; Soviet Economy and the War*.	**Union of Soviet Socialist Republics** (*in part*)
Me.	**JAMES SCORGIE MESTON, 1st Baron Meston of Agra and Dunottar.** Secretary to Finance Department, Government of India, 1906-1912. Lieut.-Governor, United Provinces of Agra and Oudh, 1912-27.	**India** (*in part*), **etc.**
M.E.Pa.	**MARION EDWARDS PARK, Ph.D.** President, Bryn Mawr College, Bryn Mawr, Pa.	**Bryn Mawr College**
M.F.C.	**MICHELE F. CANTARELLA.** Associate Professor of Italian Language and Literature, Smith College, Northampton, Mass. Contributing Editor, *Books Abroad*. Assistant Managing Editor, *Modern Language Journal*.	**Italian Literature**

M.Fe.	**MAURICE FANSHAWE.** Chief Intelligence Officer, League of Nations Union, Central Office, London.	**Mandates** (*in part*) **League of Nations**
M.Fl.	**MORRIS FISHBEIN, M.D.** Editor, *The Journal of the American Medical Association* and *Hygeia*, Chicago. Editor of medical articles, *Britannica Book of the Year*.	**Medicine, etc.**
M.G.G.	**MARTIN G. GLAESER, Ph.D.** Professor of Economics, University of Wisconsin, Madison, Wis.	**Public Utilities**
M.Gt.	**MILTON GILBERT, M.A., Ph.D.** Chief, National Income Unit, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington, D. C.	**Budgets, National National Debts, etc.**
M.Ha.	**MANNEL HAHN, B.S.** Editor, *Postal Markings*. Editorial Assistant, *The Rotarian*. Author of *U. S. Post Office, 1851–60; U. S. Postal Markings, 1847–51; So You're Collecting Stamps; The Cancellations of Waterbury, Conn., 1865–1890*.	**Philately**
M.H.McA.	**MILDRED H. MCAFEE, M.A., LL.D.** President, Wellesley College, Wellesley, Mass. Formerly, Dean of Women, Oberlin College, Oberlin, Ohio.	**Wellesley College**
M.H.T.	**MILTON HALSEY THOMAS, A.M.** Curator of Columbiana, Columbia University, New York City.	**Columbia University**
M.Jo.	**MELVIN JONES.** Secretary-General, International Association of Lions Clubs, Chicago.	**Lions Clubs**
M.L.	**MARGARET LLOYD.** Writer on The Dance for *The Christian Science Monitor*.	**Dance** (*in part*)
M.L.E.	**MORRIS L. ERNST.** Attorney, firm of Greenbaum, Wolff and Ernst, New York. Author of *Too Big*.	**Civil Liberties**
M.L.M.	**MAX L. MOORHEAD, M.A.** Assistant in History, University of California, Berkeley, Calif.	**Mexico** (*in part*), **etc.**
M.L.W.	**M. L. WILSON.** Director of Extension Work, U. S. Department of Agriculture.	**Four-H Clubs**
M.Pr.	**MARTIN POPPER, LL.B.** Executive Secretary, National Lawyers Guild.	**National Lawyers Guild**
M.Rd.	**MARGARET READ, M.A., Ph.D.** Acting Head of Colonial Department, London University Institute of Education; Lecturer in Anthropology, London School of Economics and Political Science.	**British East Africa** (*in part*) **Rhodesia** (*in part*), **etc.**
M.Sr.	**MARGARET SANGER.** Honorary Chairman, Birth Control Federation of America, Inc.	**Birth Control**
M.S.Ss.	**MARY S. SIMS.** Executive, Committee for National Interpretation and Support, the National Board, Young Women's Christian Associations of the United States of America.	**Young Women's Christian Association**
M.T.	**MICHAEL TIERNEY, M.A.** Professor of Greek, University College, Dublin. Member of Council of State, Eire. Vice-Chairman, Seanad Éireann.	**Eire** (*in part*)
M.T.M.	**MALCOLM T. MAC EACHERN, M.D.** Associate Director, American College of Surgeons.	**American College of Surgeons**
M.V.W.	**MIRIAM VAN WATERS, Ph.D.** Superintendent, Reformatory for Women, Framingham, Mass. Author of *Youth in Conflict*; etc.	**Juvenile Delinquency**
N.B.D.	**NEWTON B. DRURY, B.L.** Director, National Park Service, U. S. Department of the Interior, Washington, D. C.	**National Parks and Monuments**
N.C.B.	**NELSON C. BROWN, B.A., M.F.** Professor in charge of forest utilization, New York State College of Forestry, Syracuse University, Syracuse, N. Y.	**Lumber** (*in part*)
N.C.G.	**NATHAN CLIFFORD GROVER, D.Eng.** Chief Hydraulic Engineer (retired), U. S. Geological Survey, Department of the Interior, Washington, D. C.	**Water Power**
N.E.C.	**NORMAN E. CRUMP, F.R.Stat.S.** City Editor, *London Sunday Times*.	**Bank of England**
N.E.W.	**N. E. WAYSON, M.D.** Medical Director, U. S. Public Health Service, National Institute of Health, Division of Infectious Diseases.	**Plague, Bubonic**
N.F.	**NORMAN FRENCH,** Editor, *The Timber Trades Journal and Sawmill Advertiser*.	**Lumber** (*in part*)
N.Ha.	**NICHOLAS HANS, Ph.D., D.Litt.** Visiting Professor of Education at Cornell University in 1939.	**Education** (*in part*)
N.H.H.	**N. H. HECK, D.Sc.** Chief of Division of Geomagnetism and Seismology, U. S. Coast and Geodetic Survey, Department of Commerce, Washington, D. C.	**Seismology**
N.Ke.	**NORMAN KEEP, F.R.I.B.A.** Chartered Architect. Head of the Senior Day School and Evening Building Department, London County Council School of Building, Brixton, London.	**Building and Building Industry** (*in part*)
N.Ln.	**NATHAN LEVINSON.** Colonel, Signal Reserve, U. S. Army. Chief Engineer, Warner Bros. Pictures, Inc., Burbank, Calif.	**Motion Pictures** (*in part*)
N.L.P.	**NEWTON LACY PIERCE, B.S., M.S., Ph.D.** Instructor in Astronomy, Princeton University, Princeton, New Jersey.	**Astronomy**
N.T.	**NORMAN THOMAS, A.B., B.D., Litt.D.** Socialist presidential candidate, 1940.	**Socialism** (*in part*)
N.T.R.	**NELLIE TAYLOE ROSS.** Director of the United States Mint.	**Coinage**
O.E.P.	**OWEN E. PENCE, A.M.** Director, Bureau of Records, Studies and Trends of the National Council, Young Men's Christian Association of the United States, New York.	**Young Men's Christian Association**
O.G.L.	**ORIN GRANT LIBBY, Ph.D.** Professor of American History, University of North Dakota, Grand Forks, N. D.	**North Dakota**
O.McK.	**OLIVER MCKEE Jr., B.A.** *Washington Evening Star*, Washington, D. C.	**Democratic Party Republican Party, etc.**
O.M.Pn.	**OLGA M. PETERSON.** Public Relations Assistant, American Library Association, Chicago, Ill.	**American Library Association**
P.B.F.	**PHILIP B. FLEMING.** Brigadier General, U.S.A. Administrator, Federal Works Agency, Washington, D. C.	**Federal Works Agency**
P.Bt.	**PAUL BROCKETT.** Executive Secretary, National Academy of Sciences, Washington, D. C.	**National Academy of Sciences**
P.By.	**PAUL BELLAMY, A.B.** Editor, *Cleveland Plain Dealer*, Cleveland, Ohio.	**Cleveland Ohio**
P.C.B.	**PAUL CANFIELD BARTON, M.D.** Director of the Bureau of Investigation, American Medical Association.	**Serum Therapy**
P.D.D.	**PAUL D. DICKENS, A.B., Ph.D.** Economic Analyst, Bureau of Foreign and Domestic Commerce, U. S. A.	**Foreign Investments in the United States**
P.D.W.	**PAUL D. WHITE, M.D.** Lecturer on Medicine, Harvard University Medical School, Boston, Mass. Physician, Massachusetts General Hospital.	**Heart and Heart Diseases**
P.E.	**PAUL EDWARDS.** Editor, *Trailer Topics Magazine*.	**Trailer Coaches**
P.E.R.	**PHILIP E. RYAN, A.B., M.A.** Administrative Assistant to Vice Chairman, Insular and Foreign Operations, American National Red Cross.	**Red Cross** (*in part*)
P.H.P.	**PHILIP H. PARRISH.** Editor of the Editorial Page, *The Oregonian*, Portland, Oregon.	**Oregon**
P.My.	**PHILIP MURRAY.** President, Congress of Industrial Organizations.	**Congress of Industrial Organizations**
P.Pa.	**PATRICIA PARMELEE.** Educational Dance and Activities Director at the International Institute of Boston, Inc.	**Dance** (*in part*)
P.T.	**PAUL TITUS, M.D.** Secretary, Treasurer and Director of the American Board of Obstetrics and Gynecology.	**Gynaecology and Obstetrics**
R.A.G.	**R. A. GIBSON.** Deputy Commissioner, Northwest Territories.	**Northwest Territories**
R.A.Ga.	**RUTH A. GALLAHER, Ph.D.** Associate editor of the State Historical Society of Iowa. Author of *Legal and Political Status of Women in Iowa*, etc.	**Iowa**
R.A.V.	**R. A. VONDERLEHR, M.D.** Assistant Surgeon General, U. S. Public Health Service, Washington, D. C.	**Venereal Diseases**
R.B.B.	**RALPH B. BRYAN.** Editor, *Hide and Leather and Shoes*.	**Leather**

R.B.C.	**ROBERT B. CRAIG.** Deputy Administrator, Rural Electrification Administration, U.S. Department of Agriculture, Washington, D.C.	**Rural Electrification**
R.B.E.	**R. B. ELEAZER, A.B., A.M.** Educational Director, Commission on Interracial Co-operation, Inc., Atlanta, Ga.	**Lynchings**
R.Bl.	**ROY BLOUGH.** Director of Tax Research, U. S. Treasury Department, Washington, D. C.	**Taxation** (*in part*)
R.B.S.	**RUTH B. SHIPLEY.** Chief of the Passport Division of the Department of State.	**American Citizens Abroad**
R.D.B.	**The RT. HON. SIR RICHARD DAWSON BATES, O.B.E., D.L., M.P.** Minister of Home Affairs for Northern Ireland.	**Ireland, Northern** (*in part*)
R.D.Hu.	**ROCKWELL D. HUNT, A.M., Ph.D., LL.D., Litt.D.** Dean of the Graduate School and Professor of Economics, University of Southern California, Los Angeles, Calif.	**Los Angeles**
R.E.E.H.	**REUBEN E. E. HARKNESS, B.D., Ph.D.** President of the American Baptist Historical Society.	**Baptist Church**
R.F.K.	**ROBERT F. KELLEY.** Sports Writer, *The New York Times.*	**Polo**
R.Fs.	**ROBERT FOSS.** Editor, University of Wisconsin News Bureau, Madison, Wisconsin.	**Wisconsin, University of**
R.G.Ha.	**ROSWELL GRAY HAM, Ph.D., LL.D.** President of Mount Holyoke College, South Hadley, Mass.	**Mount Holyoke College**
R.G.Hu.	**RAY G. HULBURT, D.O.** Editor, *Journal of the American Osteopathic Association.*	**Osteopathy**
R.Glt.	**ROY GITTINGER, Ph.D., LL.D.** Dean of Administration and Professor of English History, University of Oklahoma, Norman, Okla.	**Oklahoma**
R.G.M.	**R. G. MACDONALD.** Secretary, Technical Association of the Pulp and Paper Industry.	**Paper and Pulp Industry**
R.G.S.	**ROBERT G. SPROUL, LL.D.** President, University of California, Berkeley, Calif.	**California, University of**
R.H.F.	**REGINALD H. FIEDLER.** Chief, Division of Fishery Industries, U. S. Fish and Wildlife Service, Department of the Interior, Washington, D. C.	**Fisheries**
R.Hs.	**RALPH HAYES, B.A.** Executive Director, New York Community Trust.	**Community Trusts**
R.H.So.	**RICHARD HAROLD SHREVE.** President, American Institute of Architects.	**American Institute of Architects**
R.H.Sh.	**ROBERT HALE SHIELDS, A.M.** Assistant in History, University of California, Berkeley, Calif.	**California; Spain**
R.Is.	**RAPHAEL ISAACS, M.A., M.D.** Attending Physician in Charge of Haematology, Michael Reese Hospital, Chicago.	**Anaemia**
R.L.C.	**RUSSELL L. CECIL, M.D.** Professor of Clinical Medicine, Cornell University Medical School, New York.	**Pneumonia**
R.L.Fy.	**ROSS LEE FINNEY.** American Composer. Pupil of Boulanger, Berg, Roger Sessions, and G. Francesco Malipiero. 1938 Pulitzer Scholarship, Guggenheim Fellowship. Professor of Music, Smith College, Northampton, Mass.	**Music** (*in part*)
R.L.W.	**RAY LYMAN WILBUR, A.M., M.D., LL.D., Sc.D.** President, Stanford University, California.	**Stanford University**
R.M.Le.	**ROBERT M. LESTER.** Secretary, Carnegie Corporation of New York.	**Carnegie Trusts**
R.Nt.	**ROLF NUGENT.** Director, Department of Consumer Credit Studies, Russell Sage Foundation, New York, N. Y.	**Consumer Credit**
Ro.St.	**ROBERT STEWART, B.S., Ph.D.** Dean of College of Agriculture, University of Nevada, Reno, Nev.	**Floods and Flood Control** (*in part*)
Ro.Sto.	**ROBERT STOKES.** Secretary, Press and Publications Board, Church Assembly, London. Editor of the Official Year Book of the Church of England.	**Church of England**
R.P.Br.	**RALPH P. BIEBER, Ph.D.** Professor of History, Washington University, St. Louis, Missouri.	**Missouri**
R.R.G.	**ROY R. GRINKER, M.D.** Chairman, Neuro-psychiatric Department, Michael Reese Hospital, Chicago.	**Nervous System**
R.R.P.	**RAYE R. PLATT.** Secretary, American Geographical Society, New York.	**American Geographical Society**
R.R.W.	**RUSSELL R. WAESCHE.** Rear Admiral; Commandant, U. S. Coast Guard.	**Coast Guard, U.S.**
R.S.T.	**ROBERT S. THOMAS, B.A., M.A.** Associate Military Historian, Historical Section, Army War College, Wash., D. C.	**Defense, National (U.S.)**
R.W.Be.	**RICHARD W. BECKMAN.** Director of Publicity, Iowa State College, Ames, Iowa.	**Iowa State College**
S.An.	**SIRI ANDREWS, B.A.** Assistant Professor, School of Librarianship, University of Washington, Seattle, Washington.	**Children's Books**
S.A.W.	**SARA A. WHITEHURST (Mrs. John L. Whitehurst).** President, General Federation of Women's Clubs.	**Women's Clubs, General Federation of**
S.B.F.	**SIDNEY B. FAY, Ph.D., Litt.D., L.H.D.** Professor of History, Harvard Univ. and Radcliffe College, Cambridge, Mass.	**Germany, etc.**
S.B.Wl.	**S. B. WILLIAMS, Litt.B., E.E.** Editor, *Electrical World.*	**Electrical Industries**
S.C.Ha.	**SIDNEY CHANDLER HAYWARD, B.S., M.A.** Secretary of Dartmouth College, Hanover, N. H.	**Dartmouth College**
S.D.McC.	**S. D. MCCOMB.** Manager, Marine Office of America, New York.	**Insurance, Marine**
S.E.F.	**STEPHEN E. FITZGERALD.** Chief, Production Branch, Division of Information, Office for Emergency Management, Washington, D. C.	**Priorities**
S.J.Bu.	**SOLON JUSTUS BUCK, Ph.D.** Archivist of the United States. Author of *The Granger Movement*; etc.	**Archives, National**
S.J.McK.	**S. JUSTUS MCKINLEY, Ph.D.** Professor of History and Social Science, Emerson College, Boston, Mass.	**Boston**
S.J.W.	**SIDNEY JOHN WORSLEY, D.S.O., M.C., T.D.** Fellow of King's College. Academic Registrar, University of London, since 1930, and Acting Principal, 1936–37.	**London University**
S.Lea.	**STEPHEN LEACOCK, B.A., Ph.D., Litt.D., LL.D., D.C.L.** Professor Emeritus, McGill University, Montreal.	**Canada** (*in part*)
S.McC.C.	**SAMUEL MCCREA CAVERT, D.D.** General Secretary, The Federal Council of the Churches of Christ in America.	**Federal Council of the Churches of Christ**
S.McC.L.	**SAMUEL MCCUNE LINDSAY, Ph.D., LL.D.** Professor Emeritus of Social Legislation, Columbia Univ., New York.	**International Labour Organization**
S.M.Ha.	**SHELBY M. HARRISON, LL.D.** General Director, Russell Sage Foundation.	**Russell Sage Foundation**
S.O.R.	**SAMUEL O. RICE, Ph.B.** Formerly Editor of *Capper's Farmer* and of the weekly *Kansas City Star.*	**Cereals** **Livestock, etc.**
S.P.J.	**S. PAUL JOHNSTON, B.S.** Formerly Editor of *Aviation.* Co-ordinator of Research, National Advisory Committee for Aeronautics.	**Air Forces of the World** (*in part*)
S.R.S.	**SAMUEL RAY SCHOLES, Ph.D.** Professor of Glass Technology, New York State College of Ceramics, Alfred University, Alfred, New York.	**Glass**
S.S.H.	**S. S. HUEBNER, Ph.D., Sc.D.** President, American College of Life Underwriters. Professor of Insurance and Commerce, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia, Pa.	**Stocks and Bonds**
S.So.	**SAMUEL SOSKIN, M.D., M.A., Ph.D.** Director of Metabolic and Endocrine Research, Michael Reese Hospital. Lecturer in Physiology, School of Medicine of the Division of Biological Sciences, University of Chicago, Chicago, Ill.	**Endocrinology**
S.Sp.	**SIGMUND SPAETH, Ph.D.** President, National Association for American Composers and Conductors, New York. Author of *The Art of Enjoying Music; Music for Fun;* etc.	**Music** (*in part*)
T.C.B.	**THEODORE C. BLEGEN, M.A., Ph.D., L.H.D.** Dean of Graduate School, University of Minnesota, Minneapolis, Minn.	**Minnesota**
T.D.S.	**TOM DOUGLAS SPIES, M.D.** Associate Professor of Medicine, University of Cincinnati College of Medicine, Cincinnati, Ohio. Director of the Nutrition Clinic, Hillman Hospital, Birmingham, Ala.	**Pellagra**
T.E.D.	**THOMAS E. DEWEY, LL.B., LL.M., LL.D.** Former District Attorney, New York County, New York.	**United Service Organizations**

T.G.K.	**THEODORE G. KLUMPP, M.D.** President of Winthrop Chemical Company, Inc. Formerly Chief, Drug Division, Food and Drug Administration, Federal Security Agency, Washington, D. C.	**Chemotherapy**
T.H.MacD.	**THOMAS H. MACDONALD, B.C.E.** Commissioner, Public Roads Administration, Federal Works Agency, Washington, D. C.	**Roads and Highways**
T.H.O.	**THOMAS H. OSGOOD, M.A., B.Sc., M.S., Ph.D.** Head, Department of Physics, Michigan State College, East Lansing, Mich. Co-author of *An Outline of Atomic Physics.*	**Physics**
T.J.D.	**THOMAS J. DEEGAN.** Publicist, New York.	**Air Races** **Automobile Racing, etc.**
T.J.S.	**REV. THOMAS J. SHANAHAN, S.T.B., A.M.L.S.** Librarian, St. Paul Seminary, St. Paul, Minn. President, Catholic Library association; Editor, *Ninth National Eucharistic Congress;* Contributor to *Catholic Library World.*	**Catholic Library Association**
T.M.K.	**THELMA M. KISTLER,** Economist, Division of Monetary Research, U.S. Treasury.	**Exchange Control and Exchange Rates, etc.**
T.Pk.	**THOMAS PARK, S.B., Ph.D.** Assistant Professor of Zoology, University of Chicago, Chicago, Ill. Editor of *Ecology.*	**Zoology**
T.R.J.	**T. R. JOHNSTON.** Director of Information, Purdue University, Lafayette, Ind. Author of *The Trustees and the Officers of Purdue University.*	**Purdue University**
T.S.G.	**THOMAS S. GATES, LL.D.** President, University of Pennsylvania, Philadelphia, Pa.	**Pennsylvania, University of**
V.M.K.	**VIRGINIA MERGES KLETZER (Mrs. William Kletzer).** President, National Congress of Parents and Teachers.	**Parents and Teachers, National Congress of**
V.R.	**VIOLA RIPLEY, B.Sc.** Assistant Lecturer in Biology, Huddersfield Technical College, Huddersfield, England, 1926–28.	**Zoological Gardens**
V.S.	**VILHJALMUR STEFANSSON, A.M., Ph.D., LL.D.** Geographer, Anthropologist; Commander of several arctic expeditions; since 1932 adviser on northern operations to Pan American Airways.	**Exploration and Discovery**
W.A.Ha.	**WILLIAM A. HAMOR.** Assistant Director of Mellon Institute of Industrial Research, Pittsburgh, Pa.	**Industrial Research**
Wa.Wal.	**WALTMAN WALTERS, M.D., Sc.D.** Professor of Surgery, Mayo Foundation, Univ. of Minn., Minneapolis, Minn.	**Surgery**
W.B.Pu.	**WILLIAM BARROW PUGH, D.D., LL.D.** Stated Clerk, The Presbyterian Church in the United States of America.	**Presbyterian Church**
W.C.	**WILLIAM CROCKER, A.B., A.M., Ph.D.** Managing Director, Boyce Thompson Institute for Plant Research, Inc., Yonkers, N.Y.	**Botany** (*in part*)
W.C.C.	**WALTER C. COFFEY, B.S., M.S., LL.D.** Acting President, University of Minnesota.	**Minnesota, University of**
W.Cl.	**WALTER CLARK, Ph.D.** Assistant to Vice-President in Charge of Research and Development for the Eastman Kodak Company. Author of *Photography by Infrared: Its Principles and Applications.*	**Photography** (*in part*)
W.D.L.	**WILLIAM DRAPER LEWIS, LL.B., Ph.D., LL.D.** Director, American Law Institute, Philadelphia, Pennsylvania.	**American Law Institute**
W.D.Ma.	**WILLIAM D. MARTIN, A.F.I.A.** (Australia). Economic and Statistical Research Section, Intelligence Branch, Australia House, London, since 1927.	**Australia, Commonwealth of** **New South Wales, etc.**
W.E.Bt.	**WILLIAM E. BRANDT, A.B.** Manager, Service Bureau, The National League of Professional Base Ball Clubs, New York, N. Y.	**Baseball**
W.E.Ga.	**W. E. GARRISON, Litt.D., B.D., Ph.D.** Professor of Church History, Disciples Divinity House and Associate Professor of Church History, University of Chicago, Chicago.	**Disciples of Christ**
W.E.O.	**WILLIAM E. OGILVIE.** Assistant Manager, International Live Stock Exposition, Chicago.	**Shows** (*in part*)
W.E.Ss.	**WAYNE EDSON STEVENS, M.A., D.Ph.** Professor of History, Dartmouth College, Hanover, New Hampshire.	**New Hampshire**
W.F.B.	**WALTER F. BOGNER.** Architect, Associate Professor of Architecture, School of Design, Harvard University, Cambridge, Mass.	**Architecture**
W.F.Br.	**WILLIAM F. BRAASCH, M.D.** Mayo Clinic, Rochester, Minnesota. Professor of Urology, University of Minnesota Graduate School, Minneapolis, Minn. Editorial Committee, *Journal of Urology.*	**Urology**
W.G.	**WILLIAM GREEN.** President, American Federation of Labor, Washington, D. C.	**American Federation of Labor**
W.G.Ca.	**WALTER G. CAMPBELL, LL.B.** Commissioner of Food and Drugs, Food and Drug Administration, Federal Security Agency, Washington, D. C.	**Food and Drug Administration, etc.**
W.H.Cam.	**WILLIAM HENRY CAMERON,** Managing Director, National Safety Council, Chicago, Illinois.	**Accidents** (*in part*)
W.H.Ch.	**WILLIAM HENRY CHAMBERLIN.** Author and journalist, former correspondent for *The Christian Science Monitor* in the Soviet Union, the Far East and France.	**Japan, etc.**
W.H.Ds.	**WILLIAM H. DAVIS.** Chairman of the National War Labor Board, which superseded on Jan. 12, 1942, the National Defense Mediation Board, of which Mr. Davis was also chairman.	**Defense Mediation Board, National**
W.H.G.	**WALTON HARLOWE GREEVER, A.M., D.D., LL.D.** Secretary, United Lutheran Church in America, New York.	**Lutherans**
W.J.Bt.	**W. J. BRETT.** Editor, *Fur Trade Review,* New York.	**Furs**
W.J.C.	**WILLIAM J. CUNNINGHAM, A.M.** James J. Hill Professor of Transportation, Graduate School of Business Administration, Harvard University, Boston, Mass.	**Railroads** (*in part*)
W.Ju.	**WILL JUDY.** Editor of *Dog World.*	**Shows** (*in part*)
W.L.Be.	**WILLIAM L. BENEDICT, M.D.** The Mayo Clinic, Rochester, Minn. Professor of Ophthalmology, University of Minnesota Graduate School, Minneapolis, Minn.	**Eye, Diseases of**
W.L.Pl.	**WARREN LEE PIERSON, LL.B.** President, Export-Import Bank of Washington, D. C.	**Export-Import Bank of Washington**
W.L.S.	**WILLIAM LOMMER STURDEVANT.** Director of Information, Tennessee Valley Authority, since 1933.	**Tennessee Valley Authority**
W.L.T.	**W. L. TREADWAY, M.D.** Medical Director, U. S. Public Health Service, Los Angeles, California.	**Intoxication, Alcoholic**
W.McM.	**WHEELER MCMILLEN, LL.D.** Editor in Chief, *Farm Journal and Farmer's Wife.*	**Chemurgy**
W.P.C.	**WILLIAM PITCHER CREAGER, C.E.** Consulting Hydraulic Engineer. Author of *Engineering for Masonry Dams,* etc.	**Dams**
W.P.Hl.	**WALTER P. HALL, Ph.D.** Dodge Professor of History, Princeton University, Princeton, N. J.	**Italy**
W.Pr.	**WALTER PRICHARD, M.A.** Officier d'Academie. Professor and Head of the Department of History, Louisiana State University, University Station, Baton Rouge, La. Editor, *Louisiana Historical Quarterly.*	**Louisiana**
W.P.S.	**WARREN P. SPENCER, Ph.D.** Professor of Genetics, College of Wooster, Wooster, Ohio.	**Genetics**
W.R.Ck.	**WILLIAM R. CLARK.** On the staff of *Newark Evening News,* Newark, N. J.	**New Jersey**
W.S.G.	**WALTER S. GIFFORD, A.B., LL.D.** President, American Telephone and Telegraph Company, New York.	**Telephone**
W.S.To.	**WALTER S. TOWER, M.A., Ph.D.** President, American Iron and Steel Institute, New York.	**American Iron and Steel Institute**
W.T.M.	**WILLIAM T. MANNING, D.C.L., LL.D.** Protestant Episcopal Bishop of New York.	**Protestant Episcopal Church**
W.T.St.	**W. TETLEY STEPHENSON, M.A., M.Inst.T.** Lecturer and Cassel Reader in Transport at the London School of Economics and Political Science, 1906–39.	**Motor Transportation** (*in part*)
W.W.B.	**WILLARD W. BEATTY.** Director of Education, Office of Indian Affairs, U. S. Department of the Interior, Wash., D. C.	**Indians, American**
X	**ANONYMOUS.**	



THE year 1942 of the Christian Era corresponds to the year of Creation 5702–5703 of the Jewish calendar; to the year 1360–61 of the Mohammedan hegira; to the 166th of the United States; and to the 174th year of the *Encyclopædia Britannica*.

JANUARY, 1942

1 New Year's day.
5 Second session of 77th U. S. congress convenes.
6 Admission of New Mexico to union; 30th anniversary.
6 Epiphany, or Twelfth Night.
7 Christmas in Russian Orthodox church.
8 Jackson day.
11 Centenary, birth of William James, U. S. philosopher.
13 Festival of St. Veronica.
19 Mohammedan New Year, beginning of year 1361.
20 Eve of St. Agnes.
22 Feast of St. Chrysostom.
26 Foundation day, Australia.

FEBRUARY

1 Septuagesima Sunday.
2 Candlemas. Purification of the Virgin.
2 Ground-Hog day.
3 Centenary, birth of Sidney Lanier, U. S. poet.
8 Boy Scout day, U.S.A.
12 Birth of Abraham Lincoln, 1809.
12 Establishment of Chinese republic; 30th anniversary.
14 Admission of Arizona to union; 30th anniversary.
14 St. Valentine's day.
15 Quinquagesima (Shrove Sunday).
17 Shrove Tuesday. Mardi Gras.
18 Ash Wednesday.
22 Washington's birthday, 1732.
24 Feast of St. Matthias.

MARCH

1 Admission of Nebraska to union; 75th anniversary.
1 St. David's day, patron saint of Wales.
2 Texas Independence day.
2 Total eclipse of moon begins; ends March 3.
9 Greatest brilliancy of Venus.
12 Girl Scout day, U.S.A.
16 Partial eclipse of sun begins; ends March 17.
17 St. Patrick's day, patron saint of Ireland.
21 Equinox. Beginning of spring.
25 Annunciation. Quarter day.
29 Palm Sunday.
30 Seward day, Alaska; 75th anniversary, purchase of Alaska by U.S.A.

APRIL

1 All Fools' day.
2 Maundy Thursday.
2 Jewish Passover, 1st day.
2 U. S. mint established; 150th anniversary.
3 Good Friday.
5 Easter Sunday.
6 U. S. declaration of war on Germany in World War I; 25th anniversary.
6 Army day.
14 Pan-American day.
23 St. George's day.
25 St. Mark's day.
26 Confederate Memorial day (also May 10, June 3).

MAY

1 May day. International labour festival.
5 Cinco de Mayo, Mexican holiday.
10 Rogation Sunday.
10 Mother's day.
14 Ascension day.
21 Death of Hernando de Soto; 400th anniversary.
22 Shebuoth (Jewish Pentecost).
24 Empire day. Queen Victoria born, 1819.
24 Pentecost (Whitsunday).
27 St. Bede's day.
30 Memorial or Decoration day, U.S.A.
31 Trinity Sunday.
31 Union day, South Africa.

JUNE

1 Admission of Kentucky to union; 150th anniversary.
4 Corpus Christi.
9 Trooping the colour in honour of King George VI's birthday. His majesty was actually born on Dec. 14.
11 Feast of St. Barnabas.
14 Flag day.
21 Father's day.
22 Solstice. Beginning of summer; longest day.
22 Second anniversary, signing of Franco-German armistice.
24 St. John's day.
30 St. Paul's day.

JULY

1 Dominion day, Canada; 75th anniversary.
4 Independence day.
7 Fifth anniversary, beginning of Chinese-Japanese war.
14 Bastille day.
15 St. Swithin's day.
22 Feast of St. Mary Magdalene.
26 St. Anne's day.

AUGUST

1 Swiss Independence day.
4 Birth of Percy Bysshe Shelley; 150th anniversary.
6 Feast of the Transfiguration.
10 Feast of St. Lawrence.
12 Partial eclipse of sun.
15 Assumption.
24 Feast of St. Bartholomew.
26 Total eclipse of moon.

SEPTEMBER

1 Third anniversary, beginning of World War II.
3 Third anniversary, entrance of Great Britain into World War II.
7 Labor day, U.S.A. and Canada.
10 Partial eclipse of sun.
12 Rosh Hashanah (Jewish New Year), beginning year 5703.
14 Election day in Maine.
16 Mexican Independence day.
17 Constitution day.
21 Yom Kippur (Jewish Day of Atonement).
23 Equinox. Beginning of autumn.
26 Dominion day, New Zealand.
26 Succoth (Jewish Feast of Tabernacles), 1st day.
29 Michaelmas. Quarter day.
30 Feast of St. Jerome.

OCTOBER

4 Feast of St. Francis of Assis..
12 Columbus day; 450th anniversary, discovery of America.
21 Trafalgar day.
25 St. Crispin and St. Crispinian.
27 Navy day, U.S.A.
30 Mussolini's march on Rome; 20th anniversary.
31 Hallowe'en.

NOVEMBER

1 All Saints' day. All Hallows.
3 General election day, U.S.A.
5 Guy Fawkes' day.
9 Lord Mayor's show, London.
11 Armistice day.
16 Feast of St. Edmund.
26 Thanksgiving day, U.S.A.
29 First Sunday in Advent; beginning of ecclesiastical year.
30 St. Andrew's day, patron saint of Scotland.

DECEMBER

5 U.S.S.R. Constitution day.
7 First anniversary, Japanese attack on Pearl Harbor.
7 Birth of Mary, Queen of Scots; 400th anniversary.
8 Immaculate Conception.
8 U.S. declaration of war on Japan; 1st anniversary.
17 Aviation day, U.S.A.
21 Forefathers' day.
22 Solstice. Beginning of winter; shortest day.
25 Christmas.
26 Boxing day. English bank holiday.
28 Childermas. Holy Innocents' day.

CALENDAR OF EVENTS, 1941

For elections, disasters and assassinations of 1941, see under those headings in the text. For obituaries of prominent persons who died during 1941, see under the entry Obituaries.

JANUARY

1 **Unidentified planes** believed to be German raided parts of Eire; attacks were repeated during two following days, when Dublin was bombed.

2 **Presence of German warplanes** and pilots in Italy to assist in Mediterranean campaign against British admitted in Rome.

William Allen White resigned as chairman of the Committee to Defend America by Aiding the Allies after reported rift on "short-of-war" policies.

3 **First session** of the 77th United States congress convened; Sam Rayburn (Dem., Tex.) re-elected speaker of house.

4 **Syrian high commissioner,** Gen. Henri Dentz, placed under command of Gen. Weygand by Vichy gov't.

5 **Bardia occupied** by Australian shock troops after two-day assault by land, sea and air; British claimed capture of more than 35,000 Italian prisoners.

William D. Leahy, new U.S. ambassador to France, arrived in Vichy.

6 **Pres. Roosevelt,** in annual message to congress, declared U.S.A. should act as arsenal to supply all necessary war supplies to democracies defending themselves against aggressor nations.

7 **Office of Production Management,** new "super-defense" council, established by executive order of Pres. Roosevelt; William S. Knudsen was named director general and Sidney Hillman associate director general.

8 **Budget minimum** of $17,485,528,049 in expenditures for fiscal year 1942, including $10,811,314,600 for defense, presented to congress by Pres. Roosevelt; deficit was estimated at $9,210,093,049.

Husband E. Kimmel named commander in chief of U.S. fleet; navy was divided into Pacific, Atlantic and Asiatic fleets.

9 **Retreat of French forces** on Cambodian frontier after battles with Thai troops admitted by military authorities in Indo-China.

Harry L. Hopkins, special envoy of Pres. Roosevelt to Britain, arrived in London; he conferred next day with Churchill, Halifax and Eden.

10 **Bill giving president** unlimited power to lease or loan U.S. materials of war to friendly foreign powers introduced simultaneously in house and senate.

Germany and U.S.S.R. signed trade agreement described by D.N.B., official nazi press association, as "largest grain deal in history."

Fall of Klisura to Greek forces announced in Athens.

Recapture of Buna in Kenya colony announced by British, who also claimed capture of El Wad in Italian Somaliland and start of advance into Eritrea.

11 **German-Italian communiqué** announced that first joint axis air attack in Mediterranean had damaged four British warships on Jan. 10.

12 **Wendell L. Willkie** endorsed U.S. lend-lease bill, but suggested time limit for presidential powers conferred by measure.

Clarence A. Hathaway, former editor of communist New York *Daily Worker*, expelled from party.

13 **Gen. Ubaldo Soddu** relieved as commander of Italian forces in Albania; Gen. Ugo Cavallero, chief of staff, succeeded him.

15 **Hearings on lend-lease bill** opened by house committee on foreign affairs.

Sir Gerald Campbell, high commissioner to Canada, appointed British minister to U.S.A. to assist Viscount Halifax, new ambassador.

16 **Immediate appropriation** of $350,000,000 for 200 new merchant ships requested of congress by Pres. Roosevelt.

17 **Weapons, ships and planes,** but no armies from U.S.A. in 1941, asked by Winston Churchill in Glasgow speech attended by Harry L. Hopkins.

Kassala in Anglo-Egyptian Sudan recaptured by British.

18 **Marshal Pétain and Pierre Laval** composed differences after meeting, according to Vichy communiqué.

Republican party would "never again gain control of the American government" if it endorsed a blind opposition to lend-lease bill, said Wendell L. Willkie in address at New York city.

British aircraft carrier "Illustrious" bombed by nazi planes in Mediterranean for third time in eight days.

19 **Pres. Roosevelt** conferred with Willkie in Washington and gave him personal note for Winston Churchill.

U.S.A. apologized to Germany for incident in which U.S. sailor ripped swastika flag from nazi consulate in San Francisco.

20 **Franklin D. Roosevelt** inaugurated for third term.

British mechanized forces penetrated Eritrea to depth of 30 miles.

21 **U.S.A.** lifted "moral embargo" on aircraft and aviation gasoline levied against U.S.S.R. during Finnish war.

Renewed disorders between Iron Guard and regular army broke out in Rumania; hundreds killed in clashes of following days.

22 **Tobruk fell** to British after 36-hour attack.

James C. McReynolds resigned from U.S. supreme court.

Wendell L. Willkie left aboard transatlantic plane for "fact-finding" tour of Great Britain.

Japan offered to mediate Thai-French dispute over Indo-China border.

23 **Stalemate** in European war predicted by Col. Charles A. Lindbergh in testimony on lend-lease bill before house foreign affairs committee; he suggested a negotiated peace to end conflict.

Dean G. Acheson nominated assistant sec'y of state by Pres. Roosevelt.

24 **Viscount Halifax,** British ambassador to U.S.A., was personally welcomed to new post by Pres. Roosevelt aboard battleship "King George V" in Chesapeake bay.

Bucharest reported collapse of Iron Guardist rebellion after estimated casualties of 6,000; gov't placed blame for uprising upon Horia Sima, Iron Guard leader.

25 **Rioting in Milan** and other northern Italian cities in presence of German troops reported from Belgrade.

26 **Wendell Willkie** arrived in London.

27 **SOS supposedly sent** by "Empress of Australia" reported British liner sinking off west Africa, but London declared ship was safe and suggested message was nazi hoax.

Japanese Premier Konoye asked "forgiveness of the emperor and the people" for "billions of yen . . . spent and 100,000 officers and men sacrificed" in Chinese war.

28 **Capture of Murzuk** in southern Libya by Free French after forced march from Lake Chad region announced in broadcast by Gen. Georges Catroux, who led assault on Italian garrison.

29 **Alexander Korizis** appointed Greek premier following death of Gen. John Metaxas.

30 **British entered Derna,** Libya, after unexpected 3-day resistance by Italian defenders.

Adolf Hitler declared that ships of any nationality bringing aid to Britain would be torpedoed; he prophesied that 1941 would see complete axis victory.

31 **Thai-French armistice** signed aboard Japanese cruiser at Saigon.

FEBRUARY

1 **Sec'y of Navy Frank Knox** told senate foreign relations committee he was "positive" the axis would invade western hemisphere if Britain were overwhelmed.

2 **Fierce rioting** broke out in Johannesburg, South Africa, between soldiers and anti-British demonstrators.

British armies captured Agordat, strategic mountain railroad town in Eritrea, 100 mi. west of Massawa.

3 **Pres. Batista of Cuba** ousted three "seditious" military leaders, assumed command of republic's armed forces and suspended constitutional guarantees for 15 days.

U.S. supreme court upheld constitutionality of Wages and Hours law; in another decision,

FEBRUARY—*Continued*

the court ruled that disputes between unions do not come under the Sherman Anti-trust act.

4 **British army of Nile** drove 45 mi. beyond Derna and captured ancient city of Cyrene in Libya.

Wendell Willkie flew to Dublin for a "frank, free discussion" with Eire Prime Minister Eamon De Valera.

Lend-lease bill might involve U.S.A. in war in 90 days, Gen. Robert E. Wood of America First committee told senate foreign relations committee.

5 **U.S. secret service** began fingerprinting and photographing Washington correspondents assigned to White House.

Wendell Willkie left London for U.S.A.; he asked newsmen to "tell the Germans" that "we German-Americans hate tyranny and the nazi regime."

6 **Pres. Roosevelt** named John G. Winant to be U.S. ambassador to Great Britain.

7 **British forces in Africa** captured Bengasi, major Italian port in east Libya.

Germany's annual wartime tax bill estimated at 34,000,000,000 marks by E. W. Schmidt, director of the Deutsche bank.

8 **Lend-lease bill,** empowering Pres. Roosevelt to transfer military equipment to Britain, passed in house of representatives by vote of 260 to 165.

9 **British need for U.S. tools** and war supplies rather than U.S. soldiers emphasized by Churchill in radio broadcast.

British warships hurled 300 tons of shells into Genoa, damaging oil tanks, ships and main power plant; 72 civilians killed and 226 wounded in bombardment, Rome announced.

Pierre Etienne Flandin resigned from foreign ministry in Vichy cabinet and was succeeded by Adm. Jean Darlan, who also took over post of vice-premier.

10 **Great Britain** broke off diplomatic relations with Rumania.

11 **Wendell Willkie,** in U.S. after war tour of England, urged U.S. to speed aid to Britain.

14 **Bill raising the ceiling** on U.S. national debt from $49,000,000,000 to $65,000,000,000 approved by senate.

British parachute soldiers landed in southern Italy in attempt to sabotage communications; Rome reported all were captured.

15 **Pres. Roosevelt dispatched James B. Conant,** president of Harvard university, to England on mission to exchange war science data with British.

16 **Britain in desperate and immediate need** of U.S. help, declared Harry Hopkins on return from 4-week trip in England.

17 **Japan,** through official spokesman, offered its services to end all wars, and blamed U.S. and Britain for continued conflict.

Bulgaria and Turkey signed nonaggression pact.

Supreme court upheld decision sentencing Earl Browder, general sec'y of U.S. communist party, to four years in prison for passport fraud.

Royal air force, in 1,800-mi. round-trip flight, dropped leaflets over Poland.

18 **Large Australian army** landed at Singapore; Canadians advised to leave China and Japan.

U.S. Undersec'y of State Sumner Welles rejected Japan's mediation offer; said United States was more interested in deeds than in words.

19 **Fortification of Guam** naval base voted by U.S. house of representatives.

20 **British armies** crossed Juba river and penetrated Italian Somaliland.

21 **Soviets expelled Maxim Litvinov,** former foreign commissar, from central committee of communist party for "inability to discharge obligations."

A "dangerous situation" might result from Anglo-American defense measures in the far east, Japanese Foreign Minister Yosuke Matsuoka warned.

Rome gov't slashed rations of fats, olive oil and butter by 50%.

23 **Premier Mussolini admitted Italian defeats** in Libya and Greece, but declared that German aid would help him defeat British and Greeks.

Sixteen strikes blocked $60,000,000 in defense orders in factories throughout U.S.

24 **Hitler** announced in a speech in historic Munich beer-cellar that he was planning a gigantic U-boat war against Britain.

"White race must cede Oceania" to the Japanese, Foreign Minister Yosuke Matsuoka told Japanese diet; he defined "Oceania" as huge area in Pacific capable of supporting 600,000,000 people.

Pres. Roosevelt asked congress for $3,812,311,197 in appropriations for army.

Office of Production Management placed aluminum on priorities list.

Communist party of U.S. named Robert Minor as general sec'y.

25 **Pres. Roosevelt placed bans** on export of beryllium, graphite electrodes, atropine, belladonna, sole leather and belting leather.

Soviet union approved budget of 215,400,000,000 roubles, a third of which was earmarked for national defense.

26 **British armies captured Mogadishu,** capital of Italian Somaliland, climaxing 220-mi. dash in 48 hours.

27 **Italy sent Spain a bill** for 7,500,000,000 lire for aid given Franco during Spanish civil war.

U.S. war department sent two squadrons of planes to the Philippines and six squadrons to the new Alaskan base.

Ginger Rogers and James Stewart won 1940 awards of Academy of Motion Pictures for best cinema performances of year.

28 **A plan** offered by the Office of Production Management ended C.I.O. strike at Bethlehem Steel corporation's Lackawanna plant.

Senator Wheeler assailed lend-lease bill as move to war and dictatorship in the U.S.

U.S. completed secret removal of $8,500,000,000 in gold from New York city to subterranean gold vaults at Fort Knox, Ky.

MARCH

1 **Bulgaria** signed Rome-Berlin-Tokyo pact, permitting German troops to march into Sofia.

German military authorities fined the city of Amsterdam 15,000,000 guilders as a penalty for disorders against nazi occupation.

2 **Turkey closed Straits of Dardanelles** to all ships, except those having special permits.

Bulgarian Premier Philoff told parliament in Sofia that the German "mission" in Bulgaria was there solely to "preserve peace" in the Balkans.

3 **Soviet union** denounced Bulgarian adherence to axis pact.

Office of Production Management placed magnesium on U.S. defense priorities list.

5 **Nazis passed death sentences** on 18 Netherlanders convicted of committing acts of terrorism and sabotage against Germans.

Ex-King Carol of Rumania and Mme. Lupescu fled Spain and crossed frontier into Portugal.

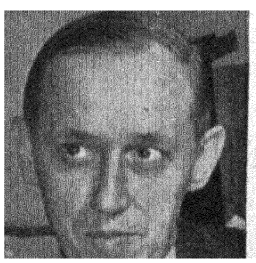
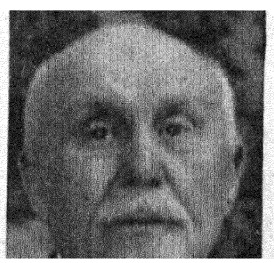
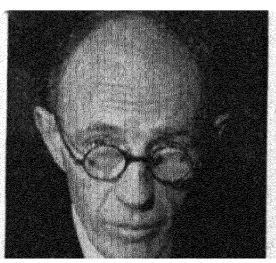
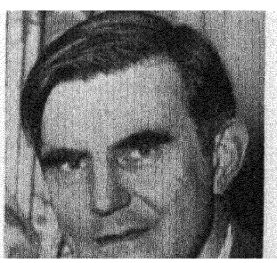
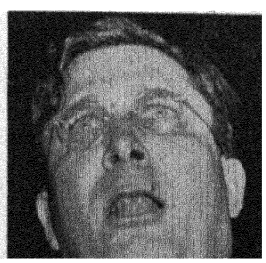
6 **U.S. requested Italy** to close two consulates in U.S. and to restrict the movements of Italian consular agents.

7 **Pres. Roosevelt** denounced jurisdictional strikes hampering defense production.

Office of Production Management placed nickel and neoprene and other synthetic rubbers on defense priorities list.

The pictures on this page are, left to right:

HOPKINS ..... Jan. 9
PÉTAIN ..... Jan. 18
HALIFAX ..... Jan. 24
WINANT ..... Feb. 6
WILLKIE ..... Feb. 11

MARCH—*Continued*

All Italian Somaliland fell to British troops; Italians fled into Ethiopia.

8 **Senate passed lend-lease bill** by vote of 60 to 31.

"The democratic way of life" in the United States could not survive if democracy over the rest of the world died, Pres. Roosevelt said in radio broadcast.

Rumanian Premier Antonescu gave Hitler, Goering and Mussolini power to veto all Rumanian economic agreements with foreign countries.

Greeks resumed offensive in Albania.

10 **Marshal Pétain appealed to U.S.** for food to ward off famine in France; Vice-Premier Admiral Darlan said French navy would fight if Britain interfered with food convoys.

France, under Japanese pressure, ceded Indo-Chinese territories to Thailand (Siam).

Bus strike tied up New York city traffic.

11 **Lend-lease bill** signed by Pres. Roosevelt.

Nazis sank 29 ships totalling 148,038 tons in week ending March 2, London admiralty admitted.

12 **Pres. Roosevelt** urged congress to appropriate $7,000,000,000 to speed arms to the democracies.

Prime Minister Churchill thanked the U.S. for enacting the lend-lease bill, which he termed a "new Magna Carta."

14 **Naval bill** asking $3,446,585,144 for building of two-ocean navy was passed by U.S. house of representatives.

15 **Pres. Roosevelt** in radio speech told U.S. that entire nation had to make sacrifices in order to defeat dictatorships.

16 **No help could save Britain,** Chancellor Hitler told audience of nazi leaders.

17 **The "Bremen,"** 51,000-ton German liner, was reported ablaze.

19 **U.S. house of representatives** passed bill earmarking $7,000,000,000 to aid "democracies resisting aggression."

Pres. Roosevelt announced creation of 11-man board to mediate strikes involving defense industries.

U.S. and Canada signed pact to develop Great Lakes-St. Lawrence waterway "for defense purposes."

20 **Plymouth** shattered by nazi air raid.

Throngs in Sydney cheered arrival of seven U.S. warships.

21 **Three Yugoslav ministers** quit cabinet in protest against gov't's readiness to join axis.

New York bus strike ended after 11 days.

22 **Grand Coulee dam** in Washington started operation, two years ahead of schedule.

24 **C.I.O. called strike** at Bethlehem Steel plant, Bethlehem, Pa.

25 **U.S.S.R. and Turkey** exchanged neutrality pledges.

Yugoslav Premier Cvetkovitch and foreign minister signed axis pact in Vienna.

Marshal Graziani "retired at his own request" as commander of Italian armies in Libya and as chief of the Italian general staff.

26 **Yugoslavs revolted** against axis pact; heavy police detachments guarded Belgrade.

French colonial garrisons clamped martial law on several Syrian cities after uprisings in Damascus and Aleppo.

British cut meat ration to six ounces weekly per person.

27 **Yugoslav army** ousted pro-axis government leaders and placed young King Peter II on throne. Gen. Dushan Simovitch, new premier, rushed mobilization of 1,200,000 men; Belgrade greeted coup with joy; U.S. promised moral and material support to new anti-axis regime, and Churchill vowed to help Yugoslavs "to defend their freedom and native land."

British troops seized Cheren, important city in Italian Eritrea.

28 **Bethlehem plant in Johnstown, Pa.,** and C.I.O. strikers signed agreement to end walkout, while C.I.O. workers at another Bethlehem plant in Cambria, Pa., started new strike.

29 **British Mediterranean fleet** battered Italian naval units in fierce engagement off Cape Matapan, Greece, sinking three cruisers and two destroyers and crippling a 35,000-ton battleship.

30 **U.S. seized 65 axis-controlled ships** docked in U.S. ports.

French shore batteries in Algeria fired on British naval units attempting to intercept a French convoy believed laden with war supplies for German units in Africa.

C.I.O. strikers voted to return to work at International Harvester plant in Chicago.

German and Italian nationals fled from Belgrade.

31 **Germany and Italy** protested to U.S. against ship seizures; U.S. department of justice issued warrants to arrest 100 nazi and 775 Italian seamen on charges of sabotage.

Yugoslavia's armed forces ready for war, Premier Gen. Dusan Simovitch told country in proclamation; nazi envoy left Belgrade.

Strike launched by 400,000 soft-coal miners after operators and C.I.O. leaders failed to reach agreement.

Violence flared at Allis-Chalmers plant near Milwaukee when police used armoured car and tear gas bombs to disperse 3,000 C.I.O. pickets who tried to prevent nonunion men from entering the plant.

APRIL

1 **Germans charged Yugoslavs** with persecution of German racial minorities.

British forces in Africa captured Asmara, capital of Italian Eritrea.

Gov. Heil of Wisconsin ordered work halted in Allis-Chalmers plant after C.I.O. pickets and sympathizers engaged in three-hour battle with police.

2 **C.I.O. strike** forced closing of Ford's River Rouge plant.

Four were killed and six wounded in riots between soft-coal strikers and nonunion miners in Harlan, Ky.

3 **U.S. asked Italy** to recall her naval attaché to Washington.

Nazi-Italian armoured units in Libya forced British troops to evacuate the port of Bengasi.

4 **German armies,** pouring through Hungary, Rumania and Bulgaria, massed at frontiers adjacent to Yugoslavia and Greece.

Pro-axis leader in Iraq ousted pro-British premier in coup d'état.

5 **Aduwa fell** to British troops in Ethiopia.

6 **Nazi armies invaded Yugoslavia and Greece;** Hitler denounced Belgrade government for "intriguing" with Britain; U.S.S.R. signed 5-year nonaggression and friendship pact with Yugoslavia; nazis bombed Belgrade.

U.S. Sec'y of State Hull assailed nazi invasion of Greece and Yugoslavia as "barbarous"; controlled soviet press also blamed nazis for invasion.

Addis Ababa capitulated to British army in Ethiopia.

U.S. Defense Mediation board won agreement from both management and union to end 75-day Allis-Chalmers strike.

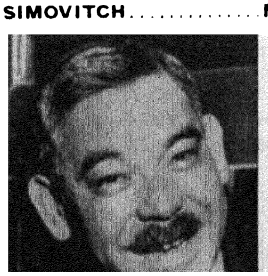
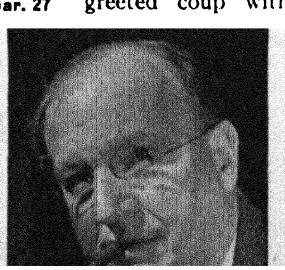
7 **Royal air force bombed Sofia,** Bulgaria; Yugoslavs took Scutari in Albania after launching offensive against Italian forces; Greeks lost Thrace to nazi armoured units, but resisted panzer thrust into Struma valley.

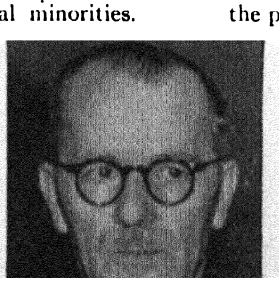
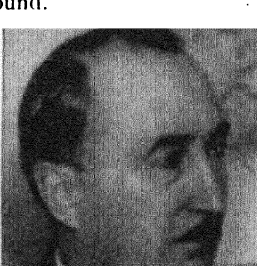
London severed diplomatic relations with Budapest.

Britain raised basic income tax rate 50% to 10 shillings on the pound.

The pictures on this page are, left to right:

MATSUOKA	Feb. 21
WHEELER	Feb. 28
CAROL	Mar. 5
CVETKOVITCH	Mar. 25
SIMOVITCH	Mar. 27

APRIL—*Continued*

NLRB ordered collective bargaining elections among workers at Ford's River Rouge and Lincoln plants and at Bethlehem Steel's Lackawanna plant.

"Honour" forbade French attack on British, Marshal Pétain declared in broadcast to nation.

8 **German army** broke through Vardar valley pass, menacing Greek force defending Salonika; nazi forces in Yugoslavia took Skoplje.

Axis forces in North Africa captured Libyan port of Derna; British retreated to Tobruk.

9 **Nazi army captured Salonika,** splitting Greece in two; Yugoslav army pierced Italian line in northern Albania, taking two towns; Nish fell to German troops advancing in Yugoslavia.

British planes bombed heart of Berlin, damaging State Opera house and other buildings.

German and Italian forces in Libya captured six British generals and 2,000 men; British took Massawa, port in Italian Eritrea.

Prime Minister Churchill appealed to U.S. for aid in keeping Atlantic sea lanes open.

10 **U.S. revealed agreement** with Danish envoy in Washington to protect Greenland against aggression, giving U.S. right to build bases on island.

80,000 Greek prisoners taken in fighting east of Vardar river valley, German high command announced; Berlin also reported capture of 20,000 Yugoslav prisoners and important gains in Yugoslavia. Turks ordered evacuation of Istanbul.

11 **Ten-day Ford strike** settled by Governor Van Wagoner of Michigan; both Henry Ford and C.I.O. agreed to concessions.

Nazi mechanized units launched fierce attack against Anglo-Greek flank in the Florina area; German troops swept through Yugoslavia and made contact with their Italian allies; Hungarian armies invaded Yugoslavia.

12 **Italians claimed advance** in Yugoslav-Albanian frontier sector; Hungarian army occupied Subotica; U.S.S.R. denounced Hungary for invading Yugoslavia.

Nazi-occupied Denmark declared "void" the agreement signed between U.S. and Danish envoy in Washington.

13 **Soviet union and Japan** signed neutrality pact under which Russia recognized Tokyo's suzerainty over Manchoukuo while Tokyo pledged to respect the Moscow-dominated Outer Mongolian People's Republic.

Nazi mechanized troops occupied Bardia in Libya, driving British forces back across the Egyptian frontier.

Stiff Anglo-Greek resistance slowed German drive in Balkans; nazi troops occupied Belgrade.

Pope Pius, in annual Easter message, appealed to all belligerents to refrain from using "still more homicidal" weapons.

14 **German-Italian motorized forces** crossed the Egyptian frontier, taking town of El Sollum.

British troops retired to new defense line in Greece near Mount Olympus; German high command said Yugoslav army was virtually destroyed.

15 **Nazi army advanced 60 mi.** into Greece; Italian forces launched twin offensive on the Greek-Albanian frontier; Hitler and Mussolini gave recognition to new, independent state of Croatia.

U.S. army should be prepared to fight anywhere, Sec'y of War Stimson said.

Four men were killed, including president and vice-president of a coal mine, and a score were wounded in gun battle involving striking miners and operators of coal mine near Middlesboro, Ky.

16 **Nazis established new line** 60 mi. within Greece; surrender of the second Yugoslav army based at Sarajevo announced by German high command; Greek troops abandoned Koritza to Italian forces on Albanian front.

Steel prices in U.S. were "frozen" at prevailing levels by Price Administrator Henderson.

17 **Entire Yugoslav army surrendered;** German tank divisions methodically drove back Greek and British armies.

Axis drive eastward along north African coast stalled near Egyptian frontier.

U.S. motor car industry voluntarily agreed to cut production by 1,000,000 cars, beginning Aug. 1, 1941.

18 **Allied armies in Greece** retired to new lines.

Retaliating for nazi raid of April 16 on London, R.A.F. subjected Berlin to a heavy bombing.

19 **Nazi troops captured Mt. Olympus** from Australian units.

British landed strong forces in Iraq to guard Mosul oil fields.

Vichy dispatches said 53 French vessels had been "requisitioned," presumably by nazis.

Soviet-Japanese pact aimed at "foiling" Anglo-American efforts to draw U.S.S.R. into war, declared *Pravda*, official communist party organ.

20 **U.S.-Canadian pact** for co-operation in producing war materials for Britain was signed by Prime Minister Mackenzie King and Pres. Roosevelt.

21 **Nazis reported British armies** in Greece fleeing in evacuation ships.

Emmanuel Tsouderos became Greek premier, succeeding Alexander Korizis, who had committed suicide.

22 **King George II of Greece** fled Athens for Crete as the Greek army of Epirus and Macedonia surrendered to nazis; British forces held the mountain pass at Thermopylae.

23 **British and Greek troops** slowed up nazi drive in rearguard action to cover evacuation; nazi armoured divisions broke through Thermopylae pass.

1,000 tons of shells were poured into Tripoli by British warships.

24 **Allied rear-guard troops** delayed German forces at Thermopylae pass; nazi bombers pounded Peiraeeus, port of Athens, while German mechanized divisions advanced to within 35 mi. of the Greek capital.

25 **Immediate extension** of U.S. neutrality patrol areas in Atlantic waters was announced by Pres. Roosevelt.

26 **German panzer units** raced across Corinth canal in effort to trap fleeing Allied troops near Athens.

27 **Increasing U.S. aid** would help British empire pass through the "long, stern, scowling valley" of war to victory, Churchill declared in a broadcast to the empire and the U.S.

Nazi mechanized divisions marched into Athens; German forces also occupied Patras on the Peloponnesus.

28 **British imperial armies** continued to evacuate Greece; Berlin claimed destruction of 285,000 tons of British shipping in Greek waters; Italian troops occupied Corfu.

Col. Lindbergh resigned his commission as a reserve officer in the U. S. air corps, declaring that Pres. Roosevelt's remarks questioning his loyalty left him "no honourable alternative."

U. S. supreme court decision ruled that Negroes are entitled to train accommodations equal to those given white passengers.

The 28-day strike of the soft-coal miners in the U. S. ended as coal operators in the southern states agreed to a wage boost of $1 per day.

The Venezuelan congress elected Gen. Isaias Angarita Medina president of Venezuela.

29 **Soviet union** banned shipment in transit through U.S.S.R. of war materials destined for foreign use.

British authorities evacuated women, children and aged from Plymouth after a series of fierce nazi air raids.

30 **British succeeded** in evacuating 48,000 of the 60,000 troops originally landed in Greece, Churchill told commons.

Russian press reported that 12,000 German troops, equipped with tanks and big guns, had landed at Abo in southern Finland.

MAY

1 **U. S. Maritime commission** announced plans were underway to shift 50 U. S. oil tankers to the service of Britain.

Lord Beaverbrook was transferred from the ministry of aircraft production and became British minister of state.

Iraqi troops massed at Habbania airdrome after the British rejected an ultimatum from the pro-axis Baghdad government to evacuate the airfield.

Sale of U. S. defense bonds and stamps was opened to the public.

2 **Iraqi artillery** shelled the British forces holding the Habbania airdrome.

3 **British beat back** Iraqi troops in the Basra area while R.A.F. planes bombed Iraqi batteries shelling British garrison in Habbania airfield.

Italy annexed Ljubljana, capital of Slovenia—a Yugoslav territory—and the area surrounding it.

Federal Communications commission adopted new regu-

MAY—*Continued*

lations designed to prevent monopolies in radio broadcasting.

4 **Pres. Roosevelt** declared the U. S. "ever ready to fight again" for its existence; Hitler boasted that Germany and her allies could defeat "any possible coalition in the world."

5 **Robert E. Sherwood** won the annual Pulitzer prize for drama with his play *There Shall Be No Night*; the New York *Times* and Westbrook Pegler, columnist, also won Pulitzer awards.

Two French freighters with 14,000 tons of U. S. flour in their holds reached Marseilles.

6 **U. S. Sec'y of War Stimson** urged the United States to use its navy to escort war supplies to Britain.

Joseph Stalin assumed the premiership of the soviet union following the resignation of Vyacheslav Molotov from that office; Molotov, however, continued in the post of foreign commissar.

Eleven American fliers, who ferried planes across the Atlantic from Canada to Britain, were reported among the 122 persons lost at sea when the boat on which they were travelling was sunk by a torpedo.

The U. S. banned all exports to the soviet union of machinery or equipment needed for U. S. defense production.

Haile Selassie returned to the Ethiopian throne he lost in 1936 to Italian armies.

7 **House of representatives** voted 266 to 120 to seize foreign vessels tied up in U. S. ports.

House of commons approved Britain's war policy in a 447 to 3 vote of confidence given to Churchill.

British land forces, aided by the R.A.F., succeeded in breaking the siege laid by Iraqi troops around Habbania airdrome.

German authorities, in a deal with French Vice-Premier Darlan, agreed to cut the cost of military occupation of France by 25%.

8 **Waves of nazi bombers** swarmed over Britain, striking particularly at the Hull area; British reported shooting down 50 of the raiders in 30 hours.

Axis planes raided the Suez canal zone.

Germany, in a note delivered to the state department, protested the U.S. government's move to seize German ships tied up in U.S. ports.

9 **Three hundred British planes** poured tons of bombs over Hamburg and Bremen.

Soviet Russia withdrew diplomatic recognition from the exiled governments of Yugoslavia, Belgium and Norway.

10 **Nazi bombers** "blitzed" London, subjecting the British capital to a fierce battering.

1,443 merchantmen totalling 5,961,044 tons employed in British interests had been sunk since the war began, the admiralty disclosed.

Eleven shipbuilding plants in the San Francisco area working on defense contracts were shut down by a strike.

Rudolf Hess, Hitler's personal deputy, flew to Scotland and made a parachute landing near Glasgow; he broke his ankle on landing, was rushed to a hospital and held incommunicado.

11 **Nazi bombers** showered London with 100,000 bombs, destroying house of commons chamber and damaging Westminster abbey, Westminster hall, the Egyptian section of the British museum and Big Ben.

12 **German statement** on the flight of Rudolf Hess to Scotland said the nazi leader was suffering from "hallucinations and a mental disease."

Adm. Darlan, Vichy vice-premier, conferred with Adolf Hitler.

13 **Germans** proclaimed the northern part of the Red sea a war zone.

14 **Bill** increasing the crop loan rate from 75 to 85% of parity was passed in the senate.

Twenty-one "flying fortresses" completed a secret mass flight to Hawaii.

15 **General Motors corp.** averted a strike of 250,000 workers at 61 plants by accepting a National Defense Mediation board peace plan and giving workers a 10-cent-an-hour wage boost.

Marshal Pétain placed his stamp of approval on the Darlan-Hitler talks and appealed to the French people to follow him on the road of "honour and national interest."

Pres. Roosevelt, concerned over Franco-German "collaboration," appealed to the French people not to support the Pétain policy.

U.S. Coast Guard, acting on the president's orders, seized every French vessel, including the giant liner, "Normandie," in U.S. harbours.

Bolivian gov't decreed expropriation of the Lloyd Aereo Boliviano, a German airline operating in Bolivia.

Completed five months ahead of schedule, the 35,000-ton U.S. battleship "Washington" joined the fleet.

16 **Royal Air Force** planes bombed German troop-carrying planes based at airdromes in Syria; Britain announced that Syria was "enemy-occupied territory" and proclaimed the Syrian coast a danger zone.

Key town of El Sollum on the Libyan border was stormed and recaptured by British.

17 **The axis air forces** and the R.A.F. traded blows in the near east, with German planes bombing British positions and British raiders attacking German and Italian concentrations in French-controlled Syria.

The soviet gov't concluded a diplomatic and trade agreement with the new Iraqi gov't.

18 **A postwar reconstruction program** giving all nations access to raw materials and banishing nationalistic trade barriers was suggested by Sec'y Hull in a radio address.

The Duke of Spoleto, cousin of King Victor Emmanuel III, became king of Croatia.

19 **Mayor La Guardia** was named by Pres. Roosevelt to head Office of Civilian Defense.

91,000 hard-coal miners ended a one-day strike after anthracite operators agreed to a demand for wage increases and paid vacations.

Agents of the "Big Five" railroad brotherhoods voted to demand a 30% increase in wages to meet the increased cost of living.

Italian force of 7,000 commanded by the Duke of Aosta surrendered to British forces in Alagi, Ethiopia.

20 **The nazis** launched an aerial invasion of Crete, landing 7,000 parachute troops from gliders; Churchill admitted a serious battle was under way for mastery of the island.

British troops seized Feluja, Iraq, 35 mi. west of Baghdad.

Egyptian steamer "Zamzam" was sunk in the south Atlantic in mid-April, it was announced in Berlin; all 312 passengers, including 138 Americans, and the ship's crew were reported safe.

21 **The German foreign office** asked the U.S. to withdraw its diplomatic representatives from Paris, the state dep't. announced.

A submarine, presumably German, sank the U.S. freighter "Robin Moor" in the south Atlantic.

22 **Air-borne nazi parachute troops** won a foothold on Crete, seizing Candia and the Maleme airport; Churchill admitted that the R.A.F. withdrew from the Crete battle because its single airdrome on the island was hopelessly battered; German dive-bombers claimed the sinking of four British cruisers and several destroyers in the Crete action.

British forces in Iraq established new positions only 20 mi. from Baghdad.

A warning to Vichy that Britain would bomb strategic areas in unoccupied zones unless the French immediately halted their German collaboration policy was sounded by Foreign Minister Anthony Eden.

The C.I.O. won a sweeping victory in the collective bargaining poll in two Detroit Ford plants, defeating the A.F. of L. by a vote of 51,866 to 20,364.

23 **German planes** landed reinforcements at Maleme airdrome as nazi air-borne contingents renewed their drive to oust Allied forces from Crete.

R.A.F. bombers crushed an Iraqi counterattack against British forces at Feluja.

24 **The "Hood,"** 42,500-ton British battle cruiser, was blown to bits by the 35,000-ton German battleship "Bismarck" between Greenland and Iceland.

German parachute troops were firmly entrenched in western Crete while nazi bombers continued to blast British warships.

25 **U.S. convoys** aiding Britain would be regarded as a "plain act of war," German Grand Admiral Erich Raeder announced in an interview.

Britain threw a giant naval dragnet around the northeastern Atlantic in the quest for the German battleship "Bismarck."

Narrowly escaping capture, King George of Greece fled Crete for Cairo.

26 **A 15-minute test blackout** was staged in Newark, N.J.

MAY—*Continued*

A new draft of all men who reached 21 after the first registration was ordered by Pres. Roosevelt; it was estimated 1,000,000 youths would be affected.

German forces in Crete drove back British imperial armies to points 15 mi. from Suda bay.

Eire Prime Minister De Valera warned Britain not to apply conscription to Ulster.

27 **The German battleship "Bismarck"** was sunk 400 mi. off the French coast after a running sea battle with British.

Pres. Roosevelt proclaimed an unlimited national emergency to place the U.S. on a war footing.

Churchill abandoned the plan to apply conscription to northern Ireland to avoid friction with the government of Eire.

28 **Germany's air-borne army** captured Canea, capital of Crete, and pressed drive to oust British warships from Suda bay.

R.A.F. planes, raiding an Italian convoy near French Tunisia, bombed port of Sfax and scored direct hit on a French freighter.

29 **British armies** started to evacuate Crete following nazi seizure of Suda bay and Candia.

A general preference order designed to give defense and vital civilian needs first call on all steel products was signed by E. R. Stettinius, priorities director of OPM.

30 **Iraq Premier Rashid Ali** fled to Iran as British troops reached the outskirts of Baghdad.

German forces controlled the whole northern coast of Crete as Anglo-Greek resistance collapsed.

31 **Secretary of Interior Ickes** was appointed by Pres. Roosevelt as Petroleum Co-ordinator for National Defense.

An armistice was signed in Baghdad between Britain and Iraq, ending month-old war.

The British Board of Trade announced that clothing would be rationed, starting June 1.

Four big bombs were dropped on Dublin by unidentified planes, killing 27 and injuring 200.

JUNE

1 **The abandonment of Crete** to the axis was admitted by the British war office in an announcement declaring 15,000 troops were safely evacuated from the island.

2 **Hitler and Mussolini** conferred for five hours at the Brenner pass on axis military and political moves.

Charles Evans Hughes retired as chief justice of the U.S. supreme court.

3 **The British Labour party** voted at its 40th annual convention to continue the war until the axis was crushed.

4 **The R.A.F.** bombed Beirut, in preparation for an invasion of the French mandated territories of Syria and Lebanon.

Axis planes staged their first air raid over Alexandria, Egypt, killing an estimated 150 persons and injuring 200 others.

5 **Sec'y Hull** warned Vichy that a policy of collaboration with Germany would meet with sharp disapproval in the U.S.

6 **Rumours** that the British were seeking peace were branded by Pres. Roosevelt as falsehoods deliberately circulated by nazis.

Bill authorizing the U.S. to requisition foreign ships lying idle in U.S. harbours was signed by Pres. Roosevelt.

8 **An Allied force** of British and Free French troops invaded Syria from three points.

9 **U.S. army** took over strike-bound North American Aviation plant upon order of Pres. Roosevelt.

The Selective Service administration ordered reclassification of essential defense workers "where they have ceased to perform their jobs."

A strike of C.I.O. die-casters closed the Cleveland plant of the Aluminum Co. of America.

Allied forces pushing into Syria neared the key cities of Damascus and Beirut.

10 **A majority of strikers** at the North American Aviation plant voted to return to their jobs.

The U.S. was already in the war, declared Premier Mussolini in a speech to the Italian nation.

11 **C.I.O. strikers** at aluminum plant in Cleveland accepted U.S. Defense Mediation board's plan to resume work on defense orders totalling $60,000,000.

The massing of nazi troops on soviet frontiers increased tension between the reich and U.S.S.R.

12 **Harlan Fiske Stone** was appointed chief justice of the U.S. supreme court by Pres. Roosevelt; Sen. James F. Byrnes (Dem., S.C.) and Attorney-General Robert H. Jackson were named associate justices.

13 **U.S. war dep't asked** for a 50% slash in motor car production.

14 **Pres. Roosevelt** ordered immediate freezing of all assets of axis and axis-occupied countries; Japan was not included in the order.

15 **Italy retaliated** for U.S. action in holding axis assets by freezing U.S. funds in Italy.

16 **Closing of all German consulates,** travel and propaganda agencies in the U.S. was ordered by the state department.

Sec'y Ickes banned shipment of 252,000 gal. of lubricating oil bound for Japan.

Thirty-five survivors of the U.S. freighter "Robin Moor," assertedly sunk by a German U-boat, were rescued by a British vessel, thus accounting for all passengers on the torpedoed boat.

17 **U.S. state department** ordered a ban on the entry of refugees with relatives in Germany and German-occupied territory.

18 **Germany and Turkey** signed a 10-year friendship treaty.

Joe Louis, heavyweight boxing champion, knocked out Billy Conn in the 13th round of a close bout.

19 **Germany and Italy** expelled U.S. consuls in reprisal for action closing all axis consulates in the U.S.

The OPM announced plans to ration rubber in an effort to reduce U.S. domestic consumption by 25%.

20 **Finland** ordered general mobilization.

Pres. Roosevelt branded the sinking of the freighter "Robin Moor" as an act of "piracy" and as a German effort to intimidate the U.S.

Pres. Roosevelt placed a curb on oil shipments from the Atlantic coast to all countries, save the Allies and Latin-American nations.

Ford Motor company signed union shop contract with the United Automobile Workers (C.I.O.).

21 **The U.S.** ordered the Italian gov't to shut all its consulates in U.S. territory.

Damascus, ancient city and capital of Syria, fell to British and Free French forces.

The Moscow radio announced that 1,500,000 Russian children would leave large soviet cities "to participate in various scientific expeditions"; this move coincided with reports that Russian civilians were fleeing western frontiers.

22 **German armies** launched an invasion of U.S.S.R. on three huge fronts stretching from the Baltic to the Black sea; nazi panzer units penetrated Russian Poland.

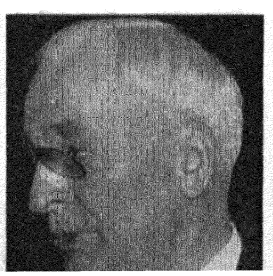
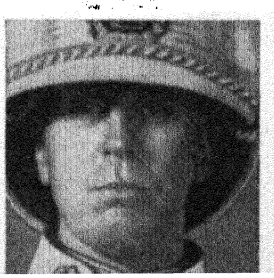
British Prime Minister Churchill promised economic and technical support for U.S.S.R.; any state that fought against Hitler would have British aid, he added.

Following the lead of her axis partner, Italy declared war on U.S.S.R.; Turkey proclaimed her neutrality.

23 **German mechanized forces** captured Brest-Litovsk.

The pictures on this page are, left to right:

DARLAN	May 12
HULL	May 18
AOSTA	May 19
DE VALERA	May 26
RASHID ALI	May 30

JUNE—*Continued*

24 Warsaw and Constanta bombed by soviet planes; German forces reported gains on all sectors of Russian front.

Pres. Roosevelt pledged U.S. to give U.S.S.R. all possible aid and ordered the release of $40,000,000 in soviet credits frozen June 14.

25 Nazi panzer divisions penetrated soviet lines south of Kaunas and east of Warsaw; Russian troops repulsed German attacks on the Bessarabian front; Russian planes bombed Finnish cities; Sweden affirmed her neutrality, but announced that permission had been granted for the passage of one nazi division from Norway across Swedish territory to Finland; Turkey assured the soviet union of her neutrality; Pres. Roosevelt announced the neutrality act would not be invoked against Russia.

Leon Henderson, federal price control administrator, stated that the gov't would fix all motor car prices.

26 German motorized divisions cracked Russian lines between Grodno and Bialystok to reach lines 50 mi. from Minsk; another panzer force reached the sector between Luck and Brody; Russian air force pounded nazi bases in Rumania and Hungary; Finland entered the war on the side of the nazis in a "defensive capacity," according to Pres. Risto Ryti.

Pope Pius XII, in a message to the 9th national eucharistic congress in St. Paul, Minn., warned that a current of "black paganism" was menacing the world.

27 Russian troops retreated along a broad sector stretching from Lithuania to the Pripet marshes to prepared positions defending Minsk; Hungary declared war on the soviet union.

U.S. Senate passed bill providing $10,384,821,624 for army appropriations.

The pictures on this page are, left to right:

ICKES ..... June 16
AUCHINLECK ..... July 1
MARSHALL ..... July 3
STALIN ..... July 3
DENTZ ..... July 9

Douglas B-19, giant 82-ton bombing plane, successfully completed test flight in California.

28 4,000 German and Russian tanks engaged in a gigantic battle in the Luck sector of Russian-held Poland; nazi divisions neared Minsk; nazi-Finnish forces launched a dual drive aimed at capturing Murmansk and Leningrad.

29 German tank divisions passed beyond Minsk.

Pres. Roosevelt ordered the induction of 900,000 more men into U.S. land forces for the year beginning July 1, 1941.

F.B.I. seized 29 suspects in the New York area on charges of espionage and conspiracy.

Churchill appointed Lord Beaverbrook minister of supply.

30 Minsk fell to twin German armies converging on the road leading from Borisov to Smolensk; a third nazi army based at Przemysl pierced Ukraine defenses and captured Lwow.

The Vichy gov't severed diplomatic relations with U.S.S.R.

JULY

1 German armies captured Riga; Berlin admitted stiff Russian resistance.

Gen. Sir Archibald Wavell was relieved of the British middle east command and replaced by Gen. Sir Claude Auchinleck; Gen. Wavell took over the India command left by Gen. Auchinleck.

Soviet Russia asked the U.S. for help and offered to pay for war supplies, U.S. state department announced.

Germany and six axis satellites recognized the Japanese-controlled puppet regime in Nanking.

Gen. Hershey, selective service head, ordered the deferment of all prospective conscripts over 28 years of age pending final congressional action on a bill to that effect.

Federal Power commission ordered creation of a 17-state power pool in the southeast U.S.

2 German columns reportedly trapped two Russian armies in the Bialystok sector, capturing 160,000 prisoners; soviet forces sped new defense lines along the Berezina river.

The North American Aviation co. at Inglewood, Calif., taken over by the army on June 9 after a strike closed the plant, was returned to the owners.

3 Soviet Premier Josef Stalin exhorted the Russian people to defend their soil by adopting a "scorched earth" policy.

Russian and German panzer units fought fiercely for control of the Berezina river in the Bobruisk and Borisov sectors; Germans admitted bad weather and Russian resistance slowed the nazi drive; Finnish-German columns pushed toward Leningrad.

Gen. Marshall, U.S. chief of staff, asked for immediate legislation to extend the military service of conscripts and national guardsmen and to permit use of U.S. armed forces beyond the western hemisphere.

4 Red army halted the nazi drive to cross the Berezina; Moscow said nazi casualties and prisoners since the beginning of the campaign totalled 700,000 troops; Berlin claimed the capture of 200,000 Russians and put Russian casualties at 600,000.

5 Powerful soviet counter-attacks checked nazi armoured divisions in the Baltic and White Russian arenas of the Russian front; panzer divisions, far ahead of the nazi main lines, reached outposts of the Stalin line at the Dnieper river, only 300 mi. from Moscow.

R.A.F. units bombed the French "invasion coast" and Rhenish industrial cities for the 21st consecutive day.

6 A century-old border wrangle between Peru and Ecuador flared into clashes between border patrols and rival air forces.

Red army took the offensive in the Lepel and Borisov sectors; German panzer divisions were halted at the Dvina river; nazi-Rumanian army was repulsed north of Jassy.

Southern coal operators signed a collective bargaining contract with C.I.O. miners.

Ten Italian generals and 5,000 Italian troops surrendered to British armies in Ethiopia.

7 Occupation of Iceland by U.S. naval and marine units announced to congress by Pres. Roosevelt.

China would fight on 4 or 14 years to victory, Chungking Foreign Minister Quo Tai-chi declared in a broadcast commemorating the fourth anniversary of the Sino-Japanese war.

8 Nazi war machine was stalled on five principal sectors of the Russian front by heavy soviet counterattacks; Maxim Litvinov, former soviet foreign commissar, exhorted the British to hurl their full weight against the Germans in the west.

U.S. occupation of Iceland was branded as "a stab in the back" by a German foreign office organ.

9 German mechanized units resumed their drive into U.S.S.R.

Gen. Henri Dentz, commander of the Vichy forces in Syria, was authorized by the Pétain government to ask the British for an armistice.

10 Pres. Roosevelt asked congress for additional defense appropriations of $4,770,065,588.

Iceland parliament approved by a 39 to 3 vote the Reykjavik government's agreement permitting U.S. armed forces to occupy the island.

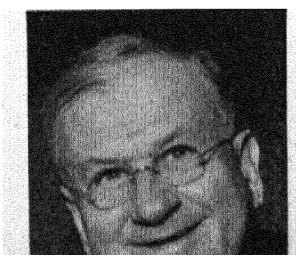
U.S. Navy warned shipping that mines had been laid in the approaches to San Francisco bay.

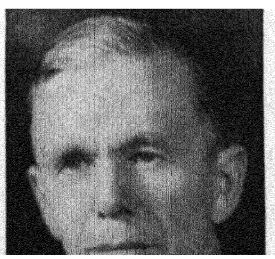
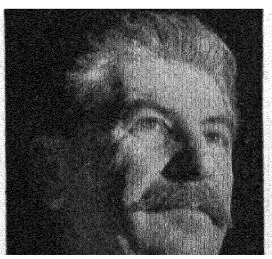
11 Additional appropriations of $3,323,000,000 for the navy and the merchant marine were asked by Pres. Roosevelt.

Belfast authorities confirmed the presence of U.S. technicians and labourers in northern Ireland.

12 Breaching of the Stalin line at all decisive points was announced by the German high command; nazi forces took Vitebsk and crossed the Dvina river, menacing Smolensk.

An armistice to end the war in Syria was concluded between the British and Free French forces and the Vichy command.



JULY—*Continued*

13 **Great Britain and soviet Russia** signed a mutual aid pact; each pledged full war aid assistance to the other and agreed not to sign a peace pact except by mutual consent.

German tank columns continued to pound the Stalin line; Moscow admitted the loss of 250,000 men, but claimed the nazis had lost 1,000,000.

14 **Thirteen German troopships,** two destroyers and a tank-laden barge were sunk in the Baltic, Moscow announced.

Japan closed the port of Kobe to foreigners for a 10-day period.

15 **German planes** blasted a path for tank columns moving on Leningrad; a nazi force swept to within 100 mi. of the northern metropolis; Russian counterdrives pushed back German armies along the Dnieper river.

Thirty-three persons were indicted in a federal court in Brooklyn on charges of acting as German espionage agents.

Churchill told commons that the soviet-British mutual aid pact meant that "the Russian people are now our allies."

16 **German high command** claimed capture of Smolensk, 230 mi. from Moscow; Russian forces checked nazi units in the Bobruisk and Novograd Volynsk sectors; Russian air fleet bombed Ploesti oil fields in Rumania; rationing of foodstuffs and manufactured goods decreed in Moscow.

Cabinet of Prince Fumimaro Konoye in Tokyo resigned.

17 **An estimated 9,000,000 men** were locked in battle along the entire Russian front.

Pres. Roosevelt issued a blacklist order freezing funds in the U.S. of 1,800 Latin-American firms having axis ties.

Gen. Franco denounced the U.S. for refusing to ship wheat to Spain.

Joe Di Maggio of the New York Yankees established a modern baseball record by hitting safely in 56 consecutive games.

The second draft lottery to determine the order in which an estimated 750,000 youths 21 years old would be drafted into the U.S. army was held in Washington.

18 **Japanese Premier Prince Konoye** formed a new cabinet, the third headed by him.

19 **Germans announced the "disintegration"** of the Russian front, declaring that Leningrad, Moscow, Kiev and Odessa were threatened by nazi armies; Stalin assumed the post of defense commissar of the soviet union.

Bolivia nipped a subversive plot laid to axis agents, declared a state of siege and demanded the ouster of the German minister.

The U.S. called upon private shippers to transfer an additional 100 oil tankers to Britain.

20 **The British** launched a propaganda campaign called the "V for Victory" drive and designed to stir revolts in axis-occupied countries.

21 **Pres. Roosevelt** urged congress to speed legislation to keep trainees in the army for more than the statutory year limit.

A nationwide drive to collect scrap aluminum for defense needs was launched in the U.S.

22 **German-Finnish forces** pressed drive on the Leningrad front; Moscow admitted nazi gains in the southern Ukraine sector.

23 **Vichy yielded to** Tokyo's demands for military bases in Indo-China, in return for which Japan agreed to "protect" that colony from British and Free French "domination."

24 **Russian armies** claimed to have stopped German drives in vicinities of Leningrad and Smolensk.

25 **Acting together** to balk further Nipponese aggression in the far east, the U.S. and Britain froze all Japanese assets.

26 **Pres. Roosevelt** placed armed forces of Philippines under U.S. command; Japan froze U.S. and British assets; U.S. defense agencies froze all stocks of raw silks; Great Britain gave notice of its intention to terminate British-Japanese-Indian-Burman trade treaties.

27 **All possible U.S. aid** to U.S.S.R. was pledged by Harry Hopkins, lend-lease coordinator, in a broadcast from London.

28 **Dutch East Indies** suspended oil agreement with Japan in a general order freezing all Japanese assets.

29 **Nazi forces** in the Smolensk area were dislodged by counterattacking Russian units, the red army claimed.

30 **Pres. Roosevelt** asked congress for authority to establish ceilings on living costs to avert inflation.

U.S.S.R. and Polish government-in-exile signed agreement ending state of war between the two countries; U.S.S.R. agreed to recognize the Polish frontiers prior to the soviet-nazi pact of Sept. 1939.

Washington protested to Tokyo over the bombing of an American gunboat, "Tutuila," at Chungking, China.

31 **Japan's prompt apology** for the bombing of the "Tutuila" was accepted by the U.S.

Pres. Roosevelt created an economic defense board and named Vice-President Henry Wallace to head the new agency.

The R.A.F., in the first direct military support given by Britain to Russia, attacked the Finnish port of Petsamo and the nazi-held port of Kirkenes in Norway.

AUGUST

1 **Pres. Roosevelt** banned export of aviation gasoline and oil to all points outside the western hemisphere, excepting the British empire and "countries resisting aggression."

OPM ordered immediate stoppage of all raw silk processing by nondefense industries.

2 **Undersec'y of State Welles** assailed Vichy's cession of Indo-China bases to Tokyo.

U.S. ordered rationing of rayon yarn to avert complete dislocation of silk mills employing some 175,000 workers.

3 **Voluntary curfew on gasoline sales** from 7 p.m. to 7 a.m. went into effect in 13 eastern states.

4 **Tax bill** of $3,206,200,000 was voted, 369 to 40, by the U.S. house of representatives.

5 **Germans** claimed to have widened the Smolensk gap in their drive on Moscow; Russians reported the halting of twin nazi drives on Kiev.

6 **German high command** claimed capture of 895,000 prisoners in the Russian campaign and estimated soviet casualties at 3,000,000 dead and wounded.

16,000 workers went on strike at shipyard in Kearny, N.J., halting work on defense contracts totalling about $450,000,000.

7 **Bill to extend army service** to 30 months passed in U.S. senate by 45 to 30 vote.

Soviet information bureau put German casualties since the beginning of the Russian campaign at 1,500,000, while estimating Russian losses at 600,000.

8 **Twenty-five soviet divisions** were trapped in a nazi pincer movement in the Ukraine, according to a German high command claim; Moscow admitted withdrawal of troops in the Ukraine area and said Berlin was twice raided by the red air force; Vichy military observers estimated nazi losses at 1,500,000 and Russian losses at 2,000,000 in the first 48 days of warfare on the Russian front.

9 **Germans hurled large masses** of men and material in a new attack on all three major fronts of the Russian theatre of war.

Steel was placed under full OPM control.

11 **Russian armies** defending the Odessa and Krivoi Rog sectors in the Ukraine area were reported perilled by a German "pocket" movement.

Pres. Roosevelt ordered the federal reserve board to place a curb on instalment-credit purchasing.

12 **Bill extending army service** to 30 months was approved by single vote in house of representatives; final ballot was 203 to 202.

Marshal Pétain pledged his Vichy regime to collaboration with Adolf Hitler's "new order."

German panzer divisions, reached the Black sea coast near Odessa and Nikolayev.

13 **R.A.F. bombers,** in a wide sweep over Germany, set fires in Berlin and blasted the Krupp works in Essen.

14 **In a historic meeting** aboard a British battleship "somewhere in the Atlantic," Pres. Roosevelt and Prime Minister Churchill agreed on an eight-point declaration of war and peace aims and pledged themselves to the common goal of "destroying nazi tyranny."

German armies captured Krivoi Rog in the southern Ukraine; Russians admitted the loss of Pervomaisk and Kirovo, key towns in the defense of Odessa.

15 **300 big British bombers** blasted three German cities.

Leon Henderson, OPACS administrator, ordered a temporary 10% cut in gasoline deliveries to retailers in 17 eastern states.

16 **Soviet Premier Stalin** accepted a proposal submitted by Pres. Roosevelt and Prime Minister Churchill to receive "high American and British officials" in Moscow to discuss long-term plans to fight the axis.

AUGUST—*Continued*

The Germans announced twin drive on Leningrad and new offensive in the central sector.

17 **The fall of Nikolayev,** Black sea naval base, was admitted in Moscow.

Great Britain and the soviet union jointly warned Iran to curb infiltration of nazi "tourists" and technicians.

Anglo-soviet trade treaty was signed, under which London would lend Moscow £10,000,000 to facilitate commerce exchanges.

Ferrying of combat planes to British near east via Brazil and Africa announced by Pres. Roosevelt.

Russian troops withdrew from Kingisepp, 70 mi. southwest of Leningrad, Moscow communiqué said.

A number of French deputies and senators were placed under "administrative custody" because of their outspoken criticism of the Pétain regime.

U.S. Ambassador Joseph Grew protested against Japan's refusal to allow the departure of a group of U.S. citizens stranded in Japan.

The U.S. ordered a census of all foreign-owned property.

19 **U.S. war department** measure to release drafted men and national guardsmen from active duty after 14 to 18 months of service was announced.

The German army hammered Russian forces falling back toward Leningrad; the Germans laid siege to Odessa and claimed victories in salients near the Dnieper river.

20 **Marshal Voroshilov** appealed to citizens of Leningrad to defend the city to the death; Marshal Budenny, commander of the Russian Ukraine armies, was reported to have blown up the huge Dnieper dam.

21 **German troops** took the cities of Narwa, Kingisepp and Novgorod in their drive on Leningrad; Russians admitted the fall of Gomel in the Kiev sector, while the nazis claimed capture of Kherson, a river port on the lower Dnieper.

Two alleged communists were executed and scores were arrested in Paris.

OPM and OPACS ordered a 26.6% cut in passenger motor car production from Aug. to Dec. 1941.

22 **Finnish troops** announced the capture of Kaekisalmi, 75 mi. north of Leningrad; soviets evacuated Nikopol on the Dnieper's west bank, Moscow said.

German authorities in Paris warned that they would shoot French hostages if attacks on Germans in the city continued.

23 **The U.S.** took over the Federal Shipbuilding and Dry Dock co. in Kearny, N.J., where construction of naval and merchant ships had been halted by a strike.

Red army forces launched counterattack in Gomel sector.

Marshal Pétain established and empowered military courts in unoccupied areas to impose death sentences in cases of terrorism and sabotage.

24 **Prime Minister Churchill** told Japan that Britain would range itself on the side of the U.S. in the event of far eastern trouble.

Twenty-five merchant ships in a British convoy were sunk by nazi U-boats and surface craft, Berlin said.

25 **Russian and British troops** simultaneously marched into Iran.

Moscow admitted the evacuation of Novgorod; a heavy battle raged in the Dnieper river area.

Vichy reported 20,000 German troops were assigned to help French police crush agitation rampant in Paris and its suburbs.

26 **U.S.S.R. warned Japan** that any effort to interfere with Russo-American trade in the far east would be considered an unfriendly act.

British troops occupied vital oil areas in southern Iran while Russian forces to the north marched into Tabriz.

Hitler's armies captured Dnepropetrovsk in the Ukraine.

27 **German forces** crossed the Dnieper river and seized Zaporozhe, Berlin reported.

28 **In an effort to speed up arms production,** Pres. Roosevelt created a seven-man Supply Priorities and Allocations board, headed by Vice-President Wallace with Donald M. Nelson as executive director.

Moscow confirmed destruction of the huge Dnieper river dam.

New Iran government ended resistance to the invasion of soviet and British troops.

In swift reprisals for the wave of sabotage sweeping France, the Vichy gov't had three men executed on the guillotine.

29 **Adolf Hitler and Benito Mussolini** held a 5-day parley on the Russian front.

German land, sea and air forces took Tallinn, capital of Estonia, after bitter fighting, Berlin announced.

U.S. war department announced plans to release 200,000 men from army service by Dec. 10, 1941 with special consideration given to dependency cases, conscripts and national guardsmen over 28 and enlisted men with three years of duty.

W. Averell Harriman, U.S. minister to London, was appointed by Pres. Roosevelt to head the U. S. delegation to the Anglo-American-Russian conference in Moscow.

French firing squads in Paris shot 8 men on charges of espionage and terrorism.

30 **Finns captured Viborg,** taken by the Russians after the Russo-Finnish war of 1939–40.

31 **Soviet forces** launched heavy counterassaults against nazi positions in the central sector and along the Dnieper river in the Ukraine.

SEPTEMBER

1 **Pres. Roosevelt** called for more energy to defeat Hitler's "insane violence" and declared he could not betray the cause of freedom with a negotiated peace.

Mexican President Avila Camacho pledged Mexican armed forces to western hemisphere defense, but declared that Mexico desired to stay out of the war.

Vichy persuaded German authorities in Paris to abandon plans for mass execution of Jewish hostages, according to Fernand de Brinon, Vichy's envoy to Paris.

2 **Berlin** reported nazi troops entered the suburb of Krasnoe Selo, only 20 mi. from Leningrad.

Mussolini and Hitler decided at their Russian front meeting to unite all Europe into a single axis-dominated state based on "harmonious co-operation of all European peoples," *Il Popolo d'Italia*, Duce's newspaper, announced.

3 **German resistance** on a 30-mi. front in the Smolensk area crumbled under lashing Russian attack, Moscow reported; German armies in Ukraine drove toward Kharkov.

Japanese Premier Konoye warned that Nippon faced gravest crisis in history and appealed to his countrymen for unity.

U.S. shipyards, in speedup of operations, would turn out 130 to 134 ships in 1941, according to figures made public by Adm. Land, chairman of maritime commission.

4 **Nazi U-boat attacked U.S.** destroyer "Greer," which was enroute to Iceland with mail; the "Greer" counterattacked with depth charges.

U.S. plane production in August 1941 reached a record high of 1,854, OPM announced.

Pres. Roosevelt authorized use of lend-lease funds to supply Polish troops in Canada with war equipment and supplies.

U.S. state department sanctioned sale of oil to Spain.

5 **Long-range** German artillery shelled Leningrad; Moscow said Russian troops counterattacked in the Leningrad area.

U.S. senate adopted 1941 revenue bill, calling for additional $3,583,900,000 in taxes, by a 67 to 5 vote.

British submarines torpedoed five Italian vessels, including 23,635-ton liner "Duilio" and a 10,000-ton cruiser, in Straits of Messina.

6 **Berlin** admitted that German submarine fired at U.S. destroyer "Greer," but declared "Greer" fired first; U.S. navy dep't denied charge.

Russian defenders of Leningrad hurled nazi columns back from city in furious battle; Moscow reported new nazi thrusts at Kiev were repulsed and said soviet armies on lower Dnieper river still held city of Zaporozhe.

7 **Red army forces** gave ground slightly before nazi troops pressing toward Leningrad.

Moscow ordered removal of Volga Germans to Siberia in move to forestall possible sabotage.

Martin Dies accused Leon Henderson and four aides of communist affiliations; Henderson denied charge.

Robert L. Riggs won U.S. men's singles title and Mrs. Sarah Palfrey Cooke won the women's singles.

U.S. freighter, "Steel Seafarer," was bombed by an unidentified plane in Red sea.

8 **British war office** announced that an Allied force landed on Spitsbergen and destroyed coal mines and a radio station.

SEPTEMBER—*Continued*

German motorized units took Schlusselburg and reached the Neva river in the drive to ring Leningrad, Hitler's headquarters announced; Germans admitted fierce Russian resistance west of besieged city.

German authorities in Paris arrested 100 leading French Jews.

Heavy R.A.F. raid on Berlin in which 27 persons were killed was branded "terroristic" and "criminal assault" by German press.

9 Marshal Timoshenko's red army troops tore 15-mi. gap in nazi central front positions and recaptured Elnya.

U.S. state department announced that the "Sessa," a U.S.-owned freighter under Panamanian registry, had been torpedoed and sunk Aug. 17, 300 mi. southwest of Iceland.

U.S. and Britain reached trade agreement under which latter agreed to cut drastically its export trade to remove suspicion that Britain had been using lend-lease materials to compete unfairly against the U.S.

Sen. Nye, in senate movie probe, charged that a small group of motion picture producers "born abroad" had been injecting pro-war propaganda into films.

10 Threatening unrest among Norwegian workers led nazi authorities to place Oslo area under martial law.

Red army troops pursued retreating German units in the Gomel and Smolensk sectors.

11 Pres. Roosevelt ordered U. S. navy to shoot first if axis raiders entered American defense zones; he said U.S. warships and planes would protect ships of every flag engaged in commerce in U.S. sea zones and said there would be no "shooting war" unless Germany continued to seek it.

The "Montana," U.S.-owned freighter, was torpedoed in waters 260 mi. southwest of Iceland.

Emperor Hirohito was placed in direct command of a new Japanese general defense headquarters.

Prime Minister Churchill defended his minister of aircraft production, J. T. C. Moore-Brabazon, against charges that latter was cool to British efforts to aid Russia.

Soviet Foreign Commissar Molotov formally charged that Bulgaria was serving as axis base.

Charles A. Lindbergh charged at an America First rally in Des Moines that "the three most important groups which have been pressing the U.S. toward war are the British, Jewish and the Roosevelt administration."

12 Authorized German spokesman asserted that President Roosevelt's "shoot first" order would compel the reich to take fitting countermeasures.

German high command announced that 22 ships in a convoy of 40 had been sunk in Atlantic.

Russian high command announced withdrawal of red army troops from Chernigov, key city midway between Kiev and Gomel; Stalin promoted Generals Ivan S. Konev and Andrei Yeremenko to the rank of colonel general.

German authorities made mass arrests in Norway to foil possible revolt by 350,000 trade unionists, Swedish reports said.

Leon Henderson froze anthracite coal prices.

13 Russians claimed Marshal Semyon Timoshenko's central front armies hurled back German thrust at Bryansk, 220 mi. southwest of Moscow; two nazi tank corps commanded by Col. Gen. Heinz Guderian were reported routed.

14 An R.A.F. wing, complete with ground crews and matériel, arrived in U.S.S.R., British air ministry announced.

Finnish hopes for early peace were voiced by Vaino Tanner, Finnish trade and communications minister.

Four time bombs exploded in Zagreb's central telephone exchange, crippling the city's telephone system and injuring a German major and 13 others.

15 Sec'y of Navy Knox told American Legion convention in Milwaukee that, beginning Sept. 16, the U.S. navy would start to protect ships carrying lend-lease aid between the American continent and Iceland.

President Roosevelt's report to congress on lend-lease aid disclosed that $6,281,237,421 had been allocated for aid and that $388,912,115 of this amount had been spent up to Aug. 31.

OPM ordered Dec., 1941 passenger motor car production cut to 48.4% below production of Dec. 1940.

Argentine Chamber of Deputies approved a resolution censuring German Ambassador Baron Edmund von Thermann for abusing his diplomatic privileges.

Red and blue armies clashed as U.S. war games, involving more than 400,000 troops, opened in Louisiana, Texas and Mississippi.

16 Reza Shah Pahlevi of Iran abdicated because of "failing health"; his son, 21-year-old Mohammed Reza Pahlevi, succeeded to throne of Iran.

Pres. Roosevelt made Edward R. Stettinius Jr. his special aid and gave him broad powers to speed arms shipments to Britain and her allies.

U.S. navy dept. announced that all contracts for the 2,831 ships needed for two-ocean fleet had been awarded.

U.S. and Norwegian government-in-exile disclosed plans to use additional 50 to 150 merchantmen in transatlantic convoy service under U.S. navy protection.

German military authorities announced execution of 10 more hostages in Paris; French "gunmen," ignoring reprisals, shot at two nazi soldiers.

17 German armies widened their bridgehead on east bank of Dnieper.

RFC contracted for purchase of $100,000,000 in soviet metal ores in return for Russian purchases of U.S. goods.

U.S. senate approved new tax bill of $3,553,400,000 and sent it to Pres. Roosevelt for signature.

Bulgaria asked Turkey to open Straits of Dardanelles to 13 warships.

American Legion in annual convention at Milwaukee adopted resolution backing Roosevelt's foreign policy and approving use of U.S. forces on foreign soil if war became unavoidable.

18 Pres. Roosevelt asked congress for new appropriation of $5,985,000,000 under lend-lease program.

Stalin ordered conscription of all civilian males in U.S.S.R. between 16 and 50 not already in military service, for training, after working hours, in use of war weapons.

Lynn U. Stambaugh was named national commander of American Legion.

19 Gen. Heinrich von Stuelpnagel, German military commander for occupied France, clamped a rigid curfew on Paris.

"Pink Star," U.S.-owned freighter, flying under Panamanian flag, was sunk between Greenland and Iceland.

German panzer spearhead entered Kiev; nazi drive 200 mi. south captured Poltava.

In first announcement of German losses in Russian war, nazi high command reported total casualties of 402,865 dead, wounded and missing, in first 71 days of fighting.

Axis-dominated Croat government executed 50 "communists and Jews" charged with having "instigated" bomb explosions in central telephone exchange of Zagreb.

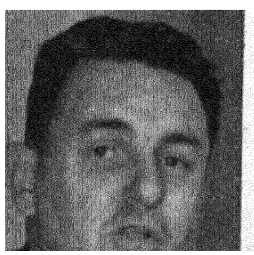
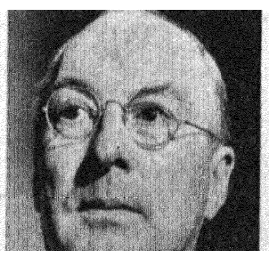
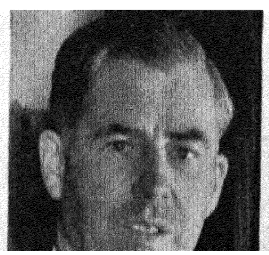
20 Berlin reported German troops were mopping up Kiev and pocket to east where 200,000 soviet soldiers were said to be trapped; Moscow estimated nazis lost 150,000 men in Kiev battle.

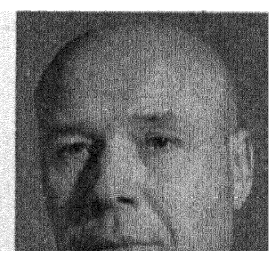
Pres. Roosevelt signed new tax bill of $3,553,400,000.

Rome dispatches said a fleet of Italian mosquito boats raided Gibraltar harbour and sank three British supply ships.

The pictures on this page are, left to right:

HENDERSON ..... **Aug. 15**
NELSON ..... **Aug. 28**
WALLACE ..... **Aug. 28**
LAND ..... **Sept. 3**
TIMOSHENKO ..... **Sept. 13**



SEPTEMBER—*Continued*

21 **Nazi panzer divisions** breached Russian lines and reached Sea of Azov, cutting off Crimea; Berlin reported Marshal Budenny's force of 150,000 men trapped east of Kiev faced total annihilation.

22 **Japan ordered new reductions** in production of non-military steel and iron goods.

23 **Pres. Roosevelt** disclosed U.S. plan to arm merchant ships.

U.S. should send Britain $1,000,000,000 in food by Feb. 1942 to prevent her defeat, Sec'y of Agriculture Wickard told house appropriations committee.

Sec'y of Navy Knox urged repeal of neutrality act in speech at launching of new 35,000-ton battleship "Massachusetts."

Argentine troops occupied two vital airdromes in move to foil plot of young aviation officers laid to nazi inspiration.

Nine Mexicans were slain when soldiers guarding home of Pres. Avila Camacho fired into 1,700 workers protesting against labour conditions in munitions plants.

Federal Reserve board ordered increase of one-seventh in reserve requirements of member banks.

Formation in London of French National council to serve as a provisional government was announced by Free French Leader Gen. Charles de Gaulle.

24 **Eleven allied governments** pledged adherence to Roosevelt-Churchill "Atlantic Charter" and mapped plans to set up food pool to rehabilitate Europe during postwar period.

25 **U. S. S. R. hurled great masses** of troops at nazi concentrations east of Dvina river 300 mi. below Leningrad.

Widespread activities of Serbian guerrillas led Rome to dispatch Italian troops to reoccupy Croatian demilitarized zone.

27 **Rome-Berlin-Tokyo axis** aimed to create "new order" for world, Japanese Foreign Minister Teijiro Toyoda said in speech on first anniversary of Japan's adherence to tripartite pact.

Capture of 665,000 Russians in Kiev battle claimed by nazi high command.

Nazi stuka planes strafed Serbian guerrillas while bombers and big guns razed the town of Uzice, centre of rebellion.

Italy announced drastic cut in bread rations to seven oz. daily per person.

"I. C. White," 7,052-ton U.S.-owned tanker under Panamanian registry, torpedoed and sunk in south Atlantic.

Fourteen U.S. merchantmon were launched in nationwide "liberty fleet day" celebration.

Reinhard Heydrich, nazi chief of security police, named reich protector of Bohemia-Moravia.

28 **Nazis arrested Czech Premier** Gen. Alois Elias and declared state of emergency in six sections of Bohemia-Moravia.

Strike of 17,000 C.I.O. steel workers at three big plants in Birmingham area ended when Gov. Dixon withdrew home guardsmen.

29 **Nazi firing squads** shot three Czech generals and 21 other "conspirators" for an attempted plot to restore Czech independence.

R.A.F. battered Turin, Genoa, Spezia and Milan.

Joe Louis knocked out Lou Nova in 6th of scheduled 15-round fight.

W. Averell Harriman, head of U.S. mission to Moscow, pledged fullest U.S. support to U.S.S.R. at opening of Anglo-U.S.-Soviet parleys in soviet capital.

30 **Prime Minister Churchill** reported British gains in military strength but warned that Germany still held initiative in all military fields except air.

Freedom of worship as well as right to propagandize against it guaranteed by constitution of U.S.S.R., as by the U.S. constitution, said President Roosevelt in press conference.

OCTOBER

1 **Delayed dispatch from Reykjavik** announced landing of new force of U.S. army units in Iceland under command of Maj. Gen. Charles H. Bonesteel.

New U.S. excise tax of 10% on retail goods went into effect; many luxury products were hit by new levy.

U.S. and Britain should police world for at least 100 years after defeat of axis to ensure peace enforcement, Sec'y of Navy Knox said in address before American Bar association.

Execution of Czech premier Elias was reported but later denied.

U.S. and British missions agreed to fill all soviet needs for war supplies, at close of three-power parley in Moscow.

Chinese military dispatches said Japanese armies had retreated in disorder from Changsha.

2 **Intensive drive against Moscow** along a 375-mi. front launched by German armies.

German bombers blasted five English towns in first big raids over Britain since beginning of Russian campaign.

Fifty-seven Czechs were executed by nazis for terrorist or treasonous activities.

Sec'y of Treasury Morgenthau urged U.S. bankers to defer loans for nondefense projects.

3 **Mayor Otakar Klapka** and a number of city council members of Prague were executed by nazis for alleged conspiracy against German protectorate.

German armies had broken backbone of Russian resistance, Hitler told German people.

British authorities called last-minute halt to scheduled exchange of some 3,000 German and British war prisoners.

Australian Prime Minister Arthur W. Fadden's government fell after debate on budget; John Curtin, labourite, accepted commission to form new government.

Charles A. Lindbergh told America First rally in Ft. Wayne that Pres. Roosevelt was leading U.S. along road which might involve suspension of congressional elections in 1942.

Pres. Roosevelt revealed that he had been pressing U.S. representatives in Moscow to prod U.S.S.R. to permit freedom of religious worship.

Six Jewish synagogues were blown up in Paris; Marshal Pétain commuted death sentence of Paul Colette, young Frenchman who shot Pierre Laval and Marcel Déat, to life imprisonment.

Pope Pius XII denounced sterilization, racial marriage laws and "mania for divorce."

4 **Soviet troops** made 18-mi. advance in the Ukraine sector, Moscow reported.

Norwegians were warned by Nazi Commissioner Josef Terboven to accept Maj. Quisling's "new order" or be annexed to reich.

5 **Soviet spokesman** put German losses at 3,000,000 dead, wounded and missing; and Russian losses at 230,000 killed, 720,000 wounded and 178,000 missing.

6 **Federal court in New York city** cleared Aluminum Company of America of monopoly charges.

Panama's cabinet forbade arming of ships flying Panamanian flag.

New York Yankees beat Brooklyn Dodgers, four games to one, to win 1941 baseball world series.

7 **German Field Marshal Fedor von Bock's** forces drove to within 130 mi. of Moscow; Field Marshal Karl von Rundstedt's armies seized ports of Mariupol and Berdiansk on Sea of Azov.

Finnish government rebuffed Britain's demand to cease war on U.S.S.R.

8 **Recapture of Ichang** in Hupeh province by Chinese admitted by Japs in Shanghai.

The pictures on this page are, left to right:

BUDENNY	Sept. 21
HEYDRICH	Sept. 27
BOCK	Oct. 7
RUNDSTEDT	Oct. 7
ARIAS	Oct. 9

OCTOBER—*Continued*

Russians admitted loss of Orel.

FBI agents arrested George S. Viereck on charges of withholding information from state dep't concerning his activities as an agent for Germany.

9 Pres. Roosevelt asked congress for immediate authority to arm U.S. merchantmen.

Arnulfo Arias, who banned arming of Panama merchant ships, was ousted as president of Panama; cabinet selected Ricardo Adolfo de la Guardia as his successor.

SPAB banned use of defense materials for public or private construction not vital to defense or public health.

10 German panzer divisions reached point 105 mi. south of Moscow.

British War office disclosed that shock troops known as "commandos" were being drilled for "invasion manoeuvres."

Plans to build up health of 200,000 youths rejected from military service because of physical or mental ailments were announced by Pres. Roosevelt.

British shipment of arms and munitions to U.S.S.R. under "lend-lease plan" was revealed by Lord Beaverbrook.

11 U.S. naval vessel discovered and "disposed of" German radio station operating in Greenland, navy dep't announced.

Russian women and children were evacuated from Moscow as nazi armies pushed closer to capital.

12 Germans advanced in Vyazma sector; red army admitted that Germans had taken Bryansk.

13 German troops occupied Vyazma, 130 mi. west of Moscow.

14 German forces reached Moshaisk and Kalinin areas.

15 Nazi armies captured Kalinin, 100 mi. northwest of Moscow.

George E. Browne, indicted president of Stage Employees and Motion Picture Operators unions, was replaced as 11th vice president of A.F. of L. at latter's convention in Seattle; convention also instructed all A.F. of L. central bodies to refuse seating to any union delegate convicted of "serious wrongdoing."

16 Japanese Premier Fumimaro Konoye's cabinet resigned after ministers failed to agree on national policy.

Rumanian troops captured Odessa after two-month siege; nazis reported capture of Kaluga.

U.S.-owned freighter, "Bold Venture," flying under Panama flag, was sunk 500 mi. south of Iceland.

Rome dispatches said Vladimir Matchek, former Croat peasant leader, had been placed under police surveillance.

17 U.S.S. "Kearny," 1,630-ton destroyer, was torpedoed and damaged while on patrol duty 350 mi. southwest of Greenland.

U.S. navy dep't ordered U.S. merchant ships in Asiatic waters to put into friendly ports.

Bill amending neutrality act to permit arming of U.S. merchantmen was passed in house of representatives by vote of 259 to 138.

U.S. Ambassador Laurence A. Steinhardt and other envoys to U.S.S.R. left Moscow.

Recapture of Orel reported in Russian broadcast.

18 Strong Russian counter-attacks blocked nazi thrusts in Kalinin and Moshaisk sectors.

Lt. Gen. Hideki Tojo formed new Japanese cabinet and took over portfolios of prime ministry, war and home ministries; Shigenori Togo was made foreign minister.

Hundreds of Yugoslav rebels were executed in an effort to stamp out the revolt of Chetniks, Serb patriots.

Canada's decision to control wages and prices was announced by Prime Minister W. L. Mackenzie King.

19 U.S. navy dep't said submarine that torpedoed "Kearny" was "undoubtedly German"; damaged destroyer reached port with 11 missing and 10 injured.

U.S. merchant ship "Lehigh" sunk in south Atlantic by submarine.

Moscow and adjoining areas were placed under state of siege.

Germans captured port of Taganrog in Donetz basin.

Names of 1,124 alleged communists or "subversive affiliates" on federal pay rolls were sent to Attorney-Gen. Biddle by Chairman Martin Dies of Un-American Activities committee.

20 Moscow diplomatic corps reached Kuibyshev (Samara), temporary headquarters for foreign envoys in soviet union.

Sec'y of Treasury Morgenthau disclosed U.S. had advanced $30,000,000 to soviet union against promise of gold delivery.

Panama's new government revoked ban on arming merchant ships.

Sec'y of State Hull denounced torpedoing of destroyer "Kearny"; Hitler's newspaper *Voelkischer Beobachter* asserted U.S. had "staged" "Kearny" incident.

21 Nazis executed 50 French hostages in Nantes, France, in reprisal for slaying of German officer by two unidentified civilians; German military commander warned unless slayers were apprehended by midnight Oct. 22, 50 more would be executed.

Russians declared all German drives on Moscow had been stopped; Berlin announced capture of Stalino, and occupation of Dagoe island at mouth of Gulf of Finland.

William Fox, former movie producer, was sentenced to year and day in federal penitentiary and fined $3,000 on charge of conspiracy to obstruct justice.

22 Germans seized 100 more French hostages after slaying of nazi major in Bordeaux.

Rumania denounced Vienna pact in effort to regain part of Transylvania surrendered to Hungary in Aug. 1940.

Gen. Robert E. Wood, acting chairman of America First committee, appealed to Pres. Roosevelt to submit question of war or peace to vote of congress.

Zagreb newspaper disclosed that nazis had executed 200 "Jews and communists" as reprisal for attack on two German soldiers in Belgrade Oct. 17.

23 Gregory K. Zhukov, chief of soviet general staff, took over command of central zone operations following shakeup of red army command; Marshal Timoshenko was shifted to southern front while Marshals Budenny and Voroshilov were charged with formation of new Russian armies.

German authorities ordered execution of 100 French hostages in reprisal for slaying of nazi commander of Nantes.

Petroleum Co-ordinator Ickes asked OPM to lift ban on gasoline sales on U.S. east coast.

U.S. war dep't announced plans to expand air force combat groups from 54 to 84 and to increase air force personnel to 400,000 by June 30, 1942.

24 Fifty French hostages were shot by Germans in retaliation for slaying of nazi officer in Bordeaux.

Arthur Starnes, parachutist, dropped 29,300 ft. before opening his 'chute in record free fall from plane over Chicago.

25 German troops captured Kharkov and launched new drive against Moscow.

26 Fifty-three thousand C.I.O. miners in captive coal pits of big steel corporations stopped work after John L. Lewis rejected Pres. Roosevelt's appeal to halt strike.

SPAB Director Donald M. Nelson barred use of defense metals for trimmings on automobiles.

27 Heavy rains on Moscow front bogged nazi armies.

28 Sen. Taft of Ohio charged that Pres. Roosevelt had "tricked" U.S. onto road to war.

Mussolini, in speech marking 20th year of fascism, boasted that "coalition of bolshevism and its European and American allies" would be shattered by axis.

29 Charles Fahy was named U.S. solicitor general by Pres. Roosevelt.

ASCAP music became available to NBC and CBS radio networks as organization of composers signed agreement with radio companies ending dispute over royalties that began Jan. 1.

30 Pres. Roosevelt ordered U.S. troops to take over Air Associates plant in Bendix, N.J., after nonstriking workers twice forced ouster of reinstated C.I.O. workers.

John L. Lewis called off captive mine coal strike until Nov. 15.

1,190-ton U.S. destroyer "Reuben James" was torpedoed and sunk while on convoy duty west of Iceland; 76 of crew missing.

31 German troops pierced outer defenses of Tula.

U.S. naval tanker "Salinas," 16,800 tons, was torpedoed without warning southwest of Iceland; no casualties were reported and vessel proceeded to port under own power.

Marshal Boris Shaposhnikov was renamed chief of staff of red army.

NOVEMBER

1 **Reich formally charged U.S.** with attacking Germany in naval incidents involving U.S. destroyers "Greer" and "Kearny."

Pres. Roosevelt conferred with Canadian Prime Minister Mackenzie King on concerted program to speed aid to U.S.S.R.

German troops advanced in Kalinin area, 95 mi. northwest of Moscow; Russians admitted nazi spearheads had entered Tula.

2 **Pres. Roosevelt placed entire coast guard** under navy dep't.

Gen. Sir Archibald Wavell reached Singapore.

Germans captured Simferopol, Crimean capital.

3 **Sec'y Hull** indicated at press conference that U.S. had been exerting pressure on Finland to end war with U.S.S.R.

Reich rejected U.S. request for compensation of $2,967,092 for torpedoing of U.S. freighter "Robin Moor" in south Atlantic May 21, Sec'y Hull revealed.

4 **Fiorello La Guardia** was re-elected mayor of New York city, polling 1,187,978 votes to 1,050,397 for his opponent, William O'Dwyer, democrat.

British warships seized six vessels in Vichy convoy trying to run contraband for Germans in south Atlantic, London admiralty reported.

Nazi divisions captured Theodosia, Crimean port near Kerch.

Women hurled eggs and tomatoes at British ambassador Lord Halifax in Detroit.

5 **Japanese gov't** announced that veteran diplomat Saburo Kurusu was enroute to Washington on mission to establish basis for peace in Pacific areas.

6 **U.S. loan of $1,000,000,000** in lend-lease aid to U.S.S.R. was arranged through exchange of letters between Roosevelt and Stalin, state dep't revealed.

Soviet government announced appointment of Maxim Litvinov to succeed Constantine Oumansky as Russian ambassador to Washington.

Premier Stalin urged creation of second front and forecast "inevitable doom" of Hitler in broadcast on 24th anniversary of October revolution; he put German war casualties at 4,500,000 and Russian losses at 1,748,000.

Nazi propaganda minister Goebbels warned Germans they would face "inferno" if reich lost war.

George Browne and Willie Bioff, who won control of A.F. of L. stage union, were found guilty by federal court in New York city of violating anti-racketeering statute.

U.S. cruiser seized "Odenwald," axis raider disguised as U.S. merchant ship, in Atlantic equatorial waters, navy announced.

7 **After 11 days of bitter debate,** U.S. senate voted 50 to 37 to amend Neutrality act to permit arming of U.S. merchantmen and entrance of U.S. ships into war zones.

Russians launched counter-offensive from Kalinin to Volokolamsk.

8 **German warships would fire on U.S. vessels** only if attacked, Adolf Hitler declared in speech marking 18th year of Munich beerhall putsch.

9 **Destruction of 11 Italian merchantmen** in Mediterranean by British naval squadron was announced by admiralty in London.

Nazi authorities announced 20 Czechs had been executed for attempting to disrupt Vienna's food supply organization.

10 **Churchill pledged U.S.** that Britain would declare war on Japan "within the hour" if Japan and U.S. should go to war.

National Mediation Defense board rejected C.I.O. demand for closed shop in captive coal mines.

U.S. navy department ordered commandant at San Diego area to proceed with work on naval construction despite strike of building trade workers.

11 **Finland rejected U.S. request** to stop fighting against U.S.S.R.

Manuel Quezon was re-elected president of the Philippines by estimated 7-to-1 margin over his nearest opponent.

12 **Executives** of "Big Five" operating railroad brotherhoods set Dec. 7 as date of scheduled strike.

Churchill told house of commons Battle of Atlantic was turning in Britain's favour.

13 **House of representatives** voted 212 to 194 to amend Neutrality act.

Counterattacking Russian troops made new gains in Tula sector; nazi forces reported capturing coast positions south of Kerch in Crimea.

14 **"Ark Royal,"** 22,500-ton British aircraft carrier, was torpedoed and sunk by axis submarine about 25 mi. east of Gibraltar.

U.S. marines were ordered by Pres. Roosevelt to leave garrisons in Shanghai, Peiping and Tientsin.

15 **U.M.W.A. officials** ordered 53,000 miners in captive coal pits to cease work at midnight.

16 **C.I.O. national executive board** voted unanimously to back John L. Lewis and United Mine Workers' Union in strike for union shop in captive coal pits.

British Labour Minister Ernest Bevin declared 1,000,000 married women were needed for munitions work.

17 **Japanese Premier Hideki Tojo** set as terms for peace in Pacific: hands off China, lifting of economic blockade against Japan and end of military encirclement.

Pres. Roosevelt and Saburo Kurusu, special Japanese envoy, conferred on Pacific crisis.

Germans claimed capture of Kerch, key city in Crimea.

Hitler placed conquered areas of U.S.S.R. under civil administration of Alfred Rosenberg, chief nazi ideologist.

Some 53,000 miners in captive pits stopped work following collapse of negotiations.

Pres. Roosevelt asked congress for $7,082,419,046 in supplemental appropriations for armed forces and for defense housing.

Pres. Roosevelt signed law repealing Neutrality act.

18 **British forces** launched a surprise sea, air and land offensive into Libya, advancing 50 mi. in first 24 hr.; Lt. Gen. Sir Alan Gordon Cunningham led land forces, while his brother, Adm. Sir Arthur Browne Cunningham, commanded navy units.

C.I.O., in its fourth constitutional convention, unanimously endorsed foreign policy of Pres. Roosevelt.

Lt. Gen. Sir Alan Brooke was named to succeed Gen. Sir John G. Dill as chief of British imperial general staff; Lt. Gen. Bernard C. Paget was appointed commander in chief of home forces, the post vacated by Gen. Brooke.

Japan's special emissary Saburo Kurusu and Ambassador Kichisaburo Nomura asked Tokyo for further instructions after three-hour parley with Sec'y Hull.

Russians admitted situation was "grave" in Crimea as red army forces withdrew from Kerch.

U.S. and Mexico reached accord under which Washington agreed to stabilize peso, make silver purchases and finance Mexican road program, while Mexico agreed to make payments on U.S. claims and attempt settlement of oil dispute.

20 **British desert armies** captured Rezegh, 10 mi. south of besieged Tobruk.

Churchill told house of commons that goal of Libyan drive was to destroy axis armies.

Gen. Maxime Weygand "retired" as Vichy proconsul in Africa; Gen. Alphonse Juin was named head of French armies in North Africa and Gen. Jean Barrau chief of units in west Africa.

U.S. halted all economic aid to French North Africa on grounds that Weygand was ousted on express demand of Hitler.

21 **Eleven C.I.O. pickets** were shot and wounded in gun battle at a captive coal pit in Edenborn, Pa.

Sixth major offensive against Moscow in three weeks was halted at Volokolamsk and Tula.

22 **Anzac troops captured Fort Capuzzo,** Italian stronghold in Libya.

Berlin announced that German troops had captured Rostov.

John L. Lewis called off strike in captive coal mines and accepted Pres. Roosevelt's proposal for arbitration of union shop issue.

23 **Anzac forces recaptured Bardia** on Libyan coast while British and nazi tank armies engaged in battle at Rezegh.

Germany cut occupation cost levied against French by 100,000,000 francs daily.

U.S. consulate in Saigon, French Indo-China wrecked by bomb; none were injured.

OPM announced use of lead and tin foil for wrapping cigarettes, candy and similar products would be prohibited after March 15, 1942.

24 **U.S. sent troops to Dutch Guiana** under agreement reached with Netherlands government in London; Brazil

NOVEMBER—*Continued*

agreed to co-operate in military measures to protect Dutch Guiana.

U.S. would extend lend-lease aid to Free French movement, Gen. De Gaulle's delegation in Washington announced.

British reported capture of Gambut in Libya.

German forces reached point 31 mi. west of Moscow.

U.S. supreme court ruled as unconstitutional California anti-migrant law designed to check influx of "Okies" into that state.

25 British tank units in Libya recoiled under counter blows of Gen. Erwin Rommel's panzer divisions.

Pres. Roosevelt appointed William C. Bullitt as his special representative in near east.

Thirteen nations, including Finland, signed anti-comintern pact in Berlin.

26 Sec'y Hull submitted new proposals for readjustment of U.S.-Japanese relations to Nippon envoys Kurusu and Nomura.

German troops driving toward Stalinogorsk flanked Tula.

Axis forces captured 5,000 British soldiers, including two generals, in Libyan desert war, Rome dispatches said.

27 Pres. Roosevelt and Sec'y Hull conferred with Japanese envoys Kurusu and Nomura amid reports that Nipponese were massing troops in Indo-China.

Anzac troops joined forces with section of British garrison in Tobruk; New Zealanders recaptured Rezegh.

Argentina agreed to sell U.S. all its tungsten production for three-year period; Japan had previously bought 50% of Argentina's tungsten output.

George S. Messersmith appointed ambassador to Mexico.

German reinforcements and "volunteer" native units battled organized Serb guerrillas in Yugoslavia.

Italian garrison in Gondar, last Italian outpost in Abyssinia, surrendered to British after seven and one-half months' siege.

28 Bill providing for creation of five-man board to control prices was passed in house of representatives, 224 to 161.

Shanghai dispatches reported 70 troop transports were moving 30,000 Japanese troops southward.

Pres. Manuel Quezon asserted Philippines were unprepared for war.

Acting Pres. Ramón Castillo ordered Argentine police to ban 5,000 meetings throughout country scheduled by pro-British Acción Argentina.

29 Russians recaptured Rostov, routing Col. Gen. Paul von Kleist's armies.

Japanese Premier Hideki Tojo declared Anglo-American "exploitation" of Asiatic peoples must be "purged with a vengeance."

British submarines in Arctic sank eight nazi supply ships carrying troops and supplies to German armies in northern U.S.S.R. British admiralty said.

House military affairs committee announced plans to probe charges that "defense brokers" had secured millions in commissions on promises to obtain government contracts.

30 Japanese Foreign Minister Shigenori Togo rejected as "fantastic" U.S. proposals for settling far eastern crisis.

A state of emergency was decreed in Singapore and new reinforcements of British and Indian troops reached Rangoon, Burma.

Cairo dispatches said mechanized British patrols reached Gulf of Sidra after 300-mi. advance across Libyan desert.

DECEMBER

1 Pres. Roosevelt conferred with Adm. Stark and Sec'y Hull on Japanese crisis; Japanese Ambassador Nomura told press "there must be wise statesmanship to save the situation"; Tokyo decided to continue parleys after hearing report by Foreign Minister Togo.

Moscow dispatches said 102 German planes were destroyed and 118 tanks and 210 guns were captured from nazis in Rostov area.

Marshal Pétain and Marshal Goering met in St. Florentin in nazi occupied France.

Compromise wage agreement arranged by Pres. Roosevelt's fact-finding board averted threatened nation-wide railway strike of 1,200,000 workers.

2 Pres. Roosevelt asked Japan for explanation of movement of troops, planes and ships into French Indo-China.

British warship squadron, headed by battleship "Prince of Wales" and battle cruiser "Repulse," arrived at Singapore.

Prime Minister Churchill asked commons for authority to draft 3,000,000 more men into armed forces and to require women to join uniformed services.

Gen. Rommel's axis tank units seized Rezegh, Libya.

Russian forces in Donetz area pursued German units fleeing west along shore of Sea of Azov.

Sixty persons charged with plotting to assassinate Mussolini appeared before tribunal in Trieste.

3 House of Representatives passed anti-strike bill by vote of 252 to 136.

Pres. Roosevelt announced that he had authorized shipments of lend-lease supplies to Turkey.

4 Reuters dispatch said Vichy had agreed to grant Hitler naval and air bases in north Africa.

House of commons passed British conscription bill by vote of 326 to 10.

5 Japan told Pres. Roosevelt that reinforcements to Indo-China were only a precaution against Chinese troop movements along colony's northern border; official Tokyo spokesman said Washington parleys would continue and that both sides were sincere.

Russian armies in Don basin swept 11 mi. past Taganrog.

House of representatives passed by 309 to 5 vote defense appropriation bill, authorizing $8,243,839,031 to expand U.S. army to 2,000,000 men.

6 Russians began counter-offensive along entire Moscow front.

Pres. Roosevelt made personal peace appeal to Emperor Hirohito after hearing reports of heavy troop concentrations in Indo-China; Philippine cabinet asked all "non-essential" civilians to leave Manila and other danger zones.

Britain announced declaration of war on Finland, Hungary and Rumania.

U.S. ordered all Finnish ships in U.S. ports put under protective custody.

7 Striking without warning, Japanese naval and air forces attacked and severely damaged U.S. ships in Pearl Harbor naval base, Hawaii, and also attacked strategic points in Philippines and Guam; Nipponese planes bombed Hongkong and Singapore; Japanese troops landed in Malaya and moved on Thailand from French Indo-China; Japanese envoys were delivering Tokyo reply to U.S. note at time of attack on U.S. possessions; note rejected U.S. terms and said U.S. and Britain were "conspiring" against Japanese interests in Asia.

Netherlands government in exile in London declared war on Japan; Canada and Costa Rica also declared war.

Sec'y of Treasury Morgenthau impounded $131,000,000 in Japanese investments in U.S. and banned all trade dealings with Japan; FBI agents received orders to round up certain Japanese nationals in U.S.

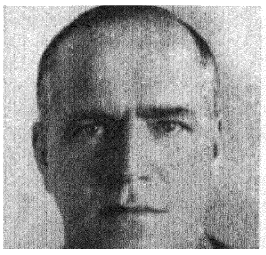
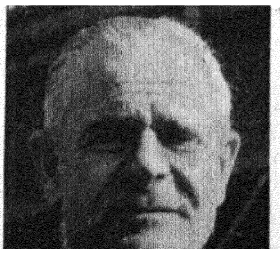
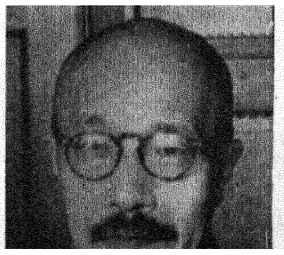
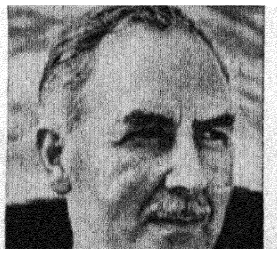
Russian armies broke German line on Moscow front at two points and destroyed two divisions.

Pres. Roosevelt's 3-man arbitration board ruled that all workers in captive mines should be required to join C.I.O.

8 U.S. congress declared war on Japan after Pres. Roosevelt denounced Japanese aggression and "treachery" in address to joint session; senate voted 82 to 0 and house voted 388 to 1; Representative Jeanette Rankin (Rep., Mont.) was lone dissenter.

The pictures on this page are, left to right:

ZHUKOV.....Oct. 23
WAVELL.....Nov. 2
TOJO.....Nov. 17
CUNNINGHAM, ALAN.....Nov. 18
WEYGAND.....Nov. 20

DECEMBER—*Continued*

Prime Minister Churchill declared war on Japan in speech before house of commons; China declared war against Germany, Italy and Japan, Foreign Minister Quo Tai-chi announced in Chungking; Free French government declared war against Japan, as did Honduras, San Salvador, Guatemala, Haiti and Dominican Republic.

Thailand capitulated to Japan, 18 hours after first attack; Singapore dispatches said British troops repulsed Japanese landing party in Malaya; Japanese planes raided Hongkong; Tokyo radio announced capture of Wake and Guam islands and said sinking of two U.S. battleships and damaging of four other capital ships in Hawaii had given Japanese naval mastery in Pacific.

San Francisco was blacked out after reports that enemy craft were sighted over city; other west coast cities and military bases were also blacked out.

Berlin spokesman admitted that winter had stopped German drive on Moscow and that capture of Russian capital was not expected before spring.

9 Pres. Roosevelt said U.S. had suffered serious reverses in Hawaii and told nation to expect long war.

False air raid alarms upset New Yorkers.

Japanese landed strong forces in Kota Bharu area of northern Malaya; British armies in Hongkong checked a Nipponese landing party.

Cuban congress voted to declare war on Japan; Nicaraguan congress approved declaration of war on Japan; Brazil froze axis funds; Argentina and Chile granted U.S. special status as "nonbelligerent."

Washington agreed to give transit over U.S. territory to Mexican troops sent to protect Lower California.

Russian armies recaptured Tikhvin on Leningrad front, reopening road to Moscow.

The pictures on this page are, left to right:

LITVINOV	**Dec. 13**
NIMITZ	**Dec. 17**
KIMMEL	**Dec. 17**
MacARTHUR	**Dec. 19**
GOEBBELS	**Dec. 20**

10 Japanese torpedo planes sank 35,000-ton battleship "Prince of Wales," and 32,000-ton battle cruiser "Repulse" off Malaya; more than 2,000 survivors were rescued from both ships; 595 were listed as missing.

Japanese forces approached Kota Bharu, important Malayan air base 350 mi. north of Singapore; British declared two Japanese attacks on Hongkong had been repulsed; Japs landed strong forces on northern Luzon coast while air raiders launched heavy attacks on Cavite naval base near Manila; U.S. planes were reported to have bombed three Japanese transports, one of which capsized.

Los Angeles was blacked out for three hours.

Sec'y Hull urged Pan American union to convoke Latin American foreign ministers for parley on hemisphere defense in Rio de Janeiro early in 1942; Chile and Argentina opened negotiations to permit Chile to fortify Strait of Magellan.

Soviet troops captured more towns in Orel sector.

British armies in Libya completely freed Tobruk garrison and captured Gambut.

11 Germany and Italy declared war on U.S. and signed new pact with Japan to preclude separate peace; U.S. congress declared war on Germany and Italy; senate vote was 88 to 0 for war against reich and 90 to 0 for war against Italy; house vote was 393 to 0 against Germany and 399 to 0 against Italy; both houses of congress removed restrictions against use of U.S. troops outside western hemisphere.

Mexico broke off relations with Germany and Italy; Cuba, Costa Rica, Nicaragua, Guatemala and Dominican Republic declared war on Germany and Italy.

Filipino army division repulsed Jap units 150 mi. north of Manila; U.S. navy communiqué announced U.S. fliers had sunk a Japanese battleship of 29,300-ton Kongo class, a cruiser and destroyer in Pacific action; a second Japanese battleship was reported damaged.

Sec'y of Navy Knox arrived in Honolulu for inspection tour.

Axis hopes of separate peace with U.S.S.R. were vain, soviet radio broadcast said.

12 U.S. forces battled Japanese invaders on three sides of Luzon island; Japanese strengthened their landing forces at Aparri and Vigan and landed troops off Zambales province and at Legaspi; small U.S. garrisons still held Wake and Midway islands.

British withdrew from advanced positions in Hongkong; Japanese said their troops had captured Kowloon; Chinese troops attacked all along Kwangtung front to relieve Japanese pressure on Hongkong; withdrawals in Malaya near Thai border acknowledged by Britain.

U.S. Senate voted $10,572,350,705 defense bill to strengthen army and navy air forces.

U.S. seized 83,000-ton liner "Normandie" and 13 other French ships.

13 U.S. armies recaptured Lingayen beach-head in Philippines and wiped out Japanese invasion force; Netherlands navy announced its submarines had sunk four Jap troop transports off Thailand; British admitted withdrawing to new positions in Kedah in Malaya.

Premier Hideki Tojo cautioned Japan against over-optimism and warned of long, hard war.

U.S. seized 20,000-ton Swedish liner "Kungsholm" under right of angary.

Gen. von Stuelpnagel, commander of nazi forces in France, ordered immediate execution of 100 French hostages.

Allied destroyers in Mediterranean sank two Italian cruisers while a British submarine sank a third cruiser, British admiralty announced.

U.S.S.R. would concentrate all efforts toward smashing Hitler's armies and did not envisage opening second front against Japan, Ambassador Maxim Litvinov told U.S. press.

Red Army troops captured Volkhov on Leningrad front.

14 U.S. bombers sank four Japanese troopships and damaged five others off northern Luzon; U.S. marines on Wake island repulsed new Japanese attacks; Hongkong rejected an ultimatum to surrender.

Turkey told U.S. she would remain neutral in new conflict; Premier Eamon De Valera reaffirmed Eire's neutrality.

15 Sec'y Knox revealed that 32,600-ton battleship "Arizona," three destroyers, a minelayer and target ship had been sunk in Japanese attack on Pearl Harbor, Dec. 7; he also said battleship "Oklahoma" was capsized but could be repaired; navy casualties in attack were 91 officers and 2,638 men killed; army casualties were 168 men and officers; Knox said Hawaii defense forces were "not on the alert," but that Japan had failed in its objective to destroy U.S. naval supremacy.

Pres. Roosevelt accused Emperor Hirohito of personal complicity in Japan's treacherous attack on U.S.

Japanese mechanized armies entered southern Kedah in Malaya; British garrison in Hongkong dug in behind barricades.

Moscow reported recapture of Klin, and announced new victories on all Russian fronts.

Both houses of congress voted bill calling for $10,077,077,005 in emergency war appropriations.

16 Filipino army division held Lingayen beach after 72-hour battle.

Japanese submarine shelled port of Kahului on island of Maui, 100 mi. southeast of Honolulu.

British command in Hongkong admitted evacuating mainland section on night of Dec. 11-12.

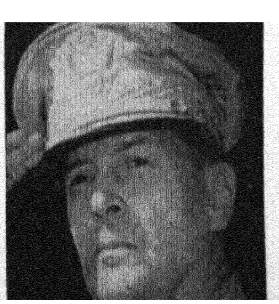
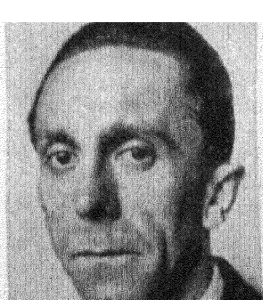
Both houses of congress adopted bills granting Pres. Roosevelt virtually unlimited war powers.

Pres. Roosevelt appointed Byron Price director of U.S. censorship.

Russian troops recaptured Kalinin, Petrovsk and Volovo; Moscow said 9th German army corps had been destroyed.

Argentina proclaimed state of siege to "fulfil international pledges" and maintain order.

17 Japanese invaders in northern Luzon were repelled; U.S. air squadrons destroyed 26 Japanese planes at Vigan.

DECEMBER—*Continued*

U.S. commanders of army, navy and air forces in Hawaii were ousted; Rear Adm. Chester W. Nimitz was named commander-in-chief of Pacific fleet, relieving Adm. Husband E. Kimmel; Lt. Gen. Delos C. Emmons was assigned to command the Hawaiian department, relieving Lt. Gen. Walter C. Short; Brig. Gen. Clarence L. Tinker was assigned to command Hawaiian air forces, relieving Maj. Gen. Frederick L. Martin.

British forces blew up oil wells and refineries in British Borneo as Japanese units made successful landing; Japanese troops in Malaya were reported in province of Wellesley; two Chinese armies continued drive to ease Japanese siege at Hongkong.

Soviet armies between Lake Onega and Murmansk launched new drive on Finnish and German armies.

18 Tokyo communiqué said Japanese force had landed on island of Hongkong; Netherlands and Australian forces occupied Portuguese section of Timor; British admitted Penang, island base off Malayan coast, had been cut off by Japanese; Australian planes bombed Japanese island in Caroline group.

U.S. reached naval agreement with French authorities of Martinique.

British armies broke axis lines west of El Gazala in Libya.

19 Thirty Japanese planes bombed port of Iloilo on Philippine island of Panay; Lt. Gen. Douglas MacArthur, commander of Philippine military forces, was raised to rank of full general; Portuguese Premier Salazar demanded evacuation of Timor island by Allied force; British garrisons withdrew from Penang.

House and senate voted bill to set draft age at 20 to 44 inclusive.

British motorized forces occupied Derna airport in Libya.

Russian troops recaptured Ruza and a score of other towns in central front drive.

Spain announced "nonbelligerent" status in Pacific war.

20 Japanese troops landed at Davao on Mindanao island, 600 mi. south of Manila, and engaged U. S. forces.

Enemy submarines off west coast attacked two U.S. tankers; navy reported axis U-boats were also operating off Atlantic coast.

British forces in Malaya organized new line south of Krian river, 300 mi. above Singapore.

Adm. Ernest J. King was named commander-in-chief of U.S. fleet; Rear Adm. Royal E. Ingersoll was named commander of Atlantic fleet, post vacated by Adm. King.

Russian armies recaptured Volokolamsk.

British force occupied Derna as two other armies pursued axis units in Libya.

Goebbels appealed to German people to donate warm clothing for nazi armies on Russian front; he read message from Hitler who admitted nazis were fighting "enemy superior in men and materials."

21 U.S. naval forces had probably sunk or damaged 14 enemy submarines in Atlantic, Sec'y Knox announced; 32 survivors of U.S. tanker "Emidio" were rescued after their ship was torpedoed 20 mi. off Pacific coast.

Adolf Hitler removed Field Marshal Walther von Brauchitsch as commander-in-chief of German army and assumed post himself.

Axis armies retreated in Libya as British periled Bengasi.

22 Prime Minister Churchill made secret trip to Washington to confer with Pres. Roosevelt.

U.S. and Filipino armies battled heavy Japanese force landed in Lingayen area from 80 Japanese transports carrying estimated 80,000 to 100,000 troops.

U.S. senate voted to increase navy enlisted personnel from 300,000 to 500,000, and marine corps enlistments from 60,000 to 104,000; Pres. Roosevelt signed amended selective service bill.

Marshal Klimenti Voroshilov was assigned to command red army in Eastern Asia.

Wake Island occupied by Japanese after 14-day resistance by garrison of 385 U.S. marines.

23 Pres. Roosevelt disclosed that he and British Prime Minister Churchill were conferring on plans for definite unity of action in Pacific; anti-axis war plans should be based upon defeating Germany not by anticipation of internal collapse but by external military blows, Churchill declared in dual press conference with Pres. Roosevelt at White House.

Batavia dispatches said Netherlands submarine sank three Japanese transports and tanker; three more U.S. ships were attacked, one was sunk off California coast.

Generalissimo Chiang Kai-shek named T. V. Soong Chinese foreign minister to replace Dr. Quo Tai-chi.

24 Free French naval force commanded by Vice-Admiral Emile Muselier occupied Vichy-governed islands of St. Pierre and Miquelon.

New Japanese landing near Atimonan on Luzon's east coast was announced by U.S. army headquarters in Philippines; British batteries shelled Japanese forces attacking on Malayan coast 300 mi. north of Singapore.

Pope Pius XII, in annual Christmas message, broadcast five-point peace program, and condemned anti-Christian movements, aggression, oppression of minorities and small countries, and economic slavery of nations.

British troops in Libya took Barce and Benina, advancing to within 12 mi. of Bengasi.

25 British garrison at Hongkong surrendered to Japanese after 16-day siege; sinking of an enemy submarine by an army bomber off California announced by U.S. army communiqué.

Ninety-eight per cent of St. Pierre's male population voted for Free French rule in plebiscite; U.S. state department assailed Free French occupation of St. Pierre and Miquelon and asked Canada what steps she would take to restore status quo.

British armies captured Bengasi.

26 Gen. MacArthur declared Manila an "open city" to spare it from air or ground attack; Jap tank units struck heavily at Lamon bay; Nipponese spearhead reached Binangonan, 110 mi. north of Manila; British admitted Japanese "patrol activity" north of Kenaman on Malayan east coast only 175 mi. north of Singapore; Air Chief Marshal Sir Robert Brooke-Popham was relieved of British far east high command and replaced by Lt. Gen. Sir Henry Pownall.

U.S. Maj. Gen. George Brett, British Gen. Sir Archibald Wavell and Chinese Generalissimo Chiang Kai-shek created an "ABC" (American-British-China) war council in Chungking.

Addressing joint session of U.S. congress, British Prime Minister Churchill declared that anti-axis forces would probably launch victory drive in 1943.

OPA Administrator Leon Henderson placed new tires under permanent rationing program.

27 Japanese planes launched heavy air attack on "open city" of Manila; Nipponese troops steadily advanced on Manila from both north and south.

Russian forces advanced on wide sweep along Oka river and captured Likhvin, rail juncture 30 mi. south of Kaluga.

British "commando" units staged raids on Vaagsoe and Maaloy islands off Norwegian coast, admiralty announced.

28 Pres. Roosevelt assured Philippines that their freedom would be redeemed, as U.S. navy promised "positive assistance" to hard-pressed islands; undefended Manila was bombed anew by Japanese planes; Nipponese armies intensified drive about 45 mi. north of Manila; Tokyo war office spokesman said Japanese armies refused to be bound by U.S. "arbitrary and unilateral" announcement of Manila as open city; Netherlands armies battled Japanese parachute troops in Dutch Sumatra near the Medan airport.

London revealed that Foreign Secretary Anthony Eden was in Moscow.

29 Gen. MacArthur shortened his lines as Japs continued drives on Manila bay; Nipponese forced spearhead through Ipoh, Malaya, and advanced to Kuantan on east coast.

30 Russian forces, covered by soviet Black sea fleet, captured Kerch and Theodosia; Russian armies on central front also recaptured Kaluga.

$50,000,000,000 yearly, half U.S. national income, would be expended for war production, Pres. Roosevelt announced.

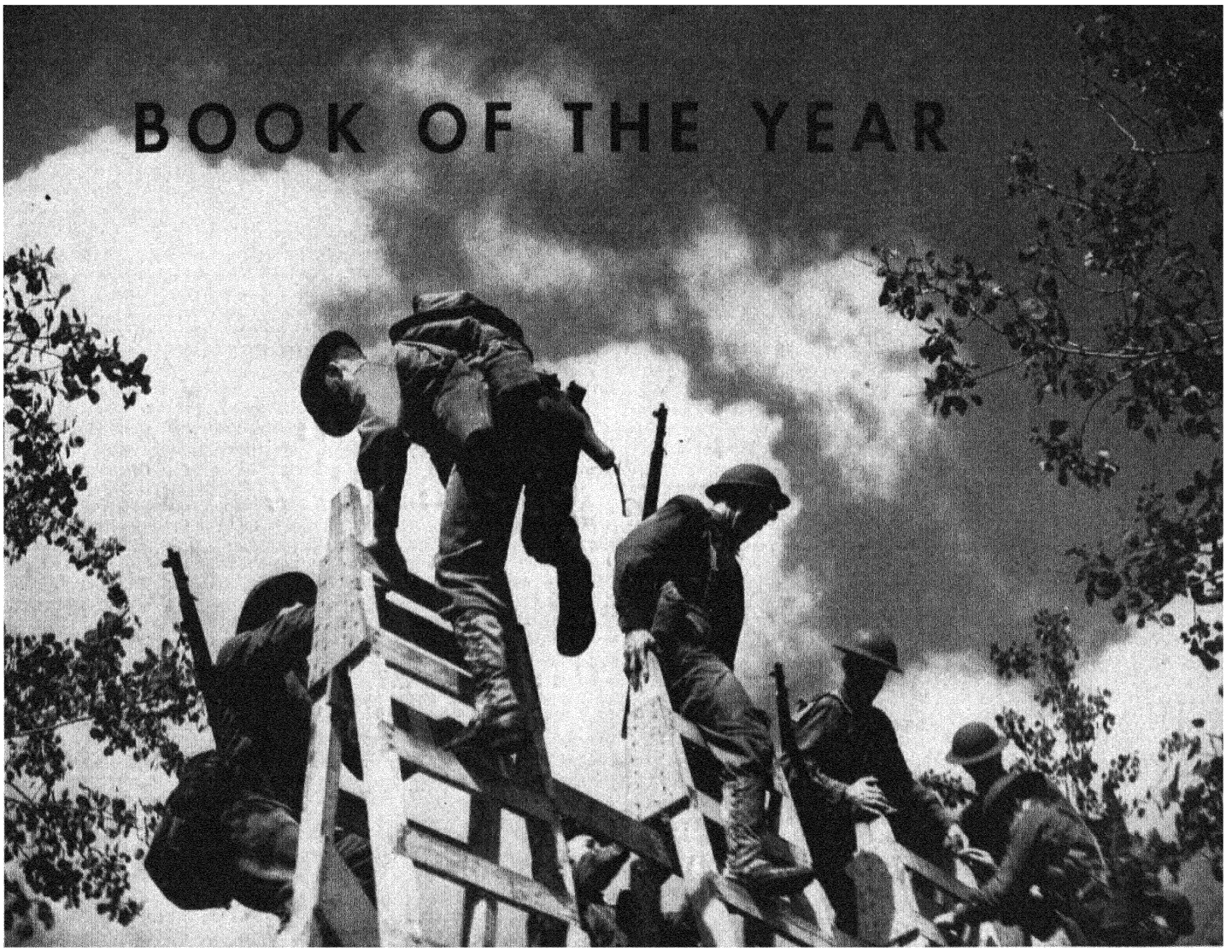
Churchill addressed Canadian parliament in Ottawa on Allied plans to defeat axis powers.

Charles A. Lindbergh offered his services to U.S. army air forces.

Mohandas K. Gandhi quit leadership of All-India National congress party because it abandoned civil disobedience policy.

31 Tokyo dispatches said Nipponese troops reached lines 20 mi. from Manila.

Hitler, in New Year's message, warned German people of hard fighting ahead in 1942.



AAA: *see* AGRICULTURE.

Abrasives. The changing requirements resulting from the development of the automotive industry have led to marked expansion in the production, use and varieties of abrasives, and the increased industrial activity incident to the defense program has been responsible for increased demand for certain types of abrasives, especially the artificial types and some of the high-grade natural varieties. The table on p. 18 lists the production of the various types of abrasives in the United States from 1937–40.

Corundum.—The United States has no domestic production of corundum, a natural oxide of aluminum, but depends entirely on imports, mainly from South Africa, which furnishes the bulk of the world supply. United States imports, usually of the order of 2,000–4,000 tons annually, were 2,609 long tons in 1940. South African sales rose from 2,625 short tons in 1939 to 4,211 tons in 1940, of which 3,375 tons went to the United States and 836 tons to Great Britain.

Diamonds.—A large share of the world's diamond output is used for abrasive work, but little definite information is available outside of the United States imports, which have more than doubled since 1937, and have increased more than twentyfold since 1930. This phenomenal growth in demand was due partly to the use of diamond-pointed tools for many types of fine machine work, and partly to the growing use of special types of high-speed machine tools, such as tungsten carbide, which require a bonded diamond wheel for dressing. Since this type of work was largely centred in the automobile and aeroplane industries, the defense program resulted in an increased demand for diamond abrasives. United States imports were mainly under the classification of glaziers', engravers' and miners' diamonds, but there were in addition small imports under the heading of bort and of diamond dust. The 1940 imports included 3,809,071 carats valued at $11,026,563 under the first heading, 785 carats of bort valued at $19,660, and diamond dust valued at $2,515, and 1941 was expected to show a further increase. (*See* also DIAMONDS.)

Emery.—In addition to the output reported in the table the United States imports emery from Turkey and Greece, the two chief sources of world supply, each of which produces 10,000–15,000 tons annually. Imports vary widely from year to year, being 426 long tons in 1938, 1,956 long tons in 1939 and 5,105 long tons in 1940.

Flint.—Imports of silex for liners and flint pebbles for medium grinding in ball mills were cut off by the German occupation of Belgium, Denmark and France, the former sources of supply, and the shortage was being supplied from domestic sources and by substitutes. Production was reported from Jasper, Minn., Lilesville, N.C., Carlsbad, Calif., Iron City, Tenn., Salisbury, N.C., and Los Angeles, Calif., as well as from Gouverneur and Knollys, Sask., and from beach deposits in Newfoundland. Substitutes being tried included topaz, granite blocks, corundum pebbles, balls of porcelain and of compressed silica flour with a sodium silicate binder, and lumps of the same material being ground.

Garnet.—There was little production of garnet outside of the United States, although there was some in Spain, South Africa and Sweden. The United States output comes from the Adirondack regions of New York and New Hampshire.

Grindstones, Millstones and Pulpstones.—Little information was available on these products aside from the production data in

United States Production of Abrasives
(In short tons, or as indicated)

	1937	1938	1939	1940
Aluminous Abrasives				
Corundum[1]	2,085	2,131	2,029	2,989
Emery	320	..	765	1,046
Carbon Abrasives				
Industrial diamonds, carats[1]	1,885,970	1,307,398	3,590,111	3,809,856
Silica Abrasives				
Quartz	13,012	18,611	34,050	31,865
Sand (abrasive)	?	?	668,027	856,309
Sand and sandstone (ground)	328,156	237,167	310,512	342,218
Tripoli	34,936	22,188	33,474	30,212
Silica Stone Abrasives				
Grindstones	11,617	4,653	7,017	8,790
Millstones (value)	$8,305	$3,743	$11,084	$6,558
Pulpstones	2,924	1,553	2,517	4,533
Sharpening stones	810	511	620	?
Silicate Abrasives				
Garnet	4,863	2,669	4,056	4,716
Pumice	71,007	65,742	89,159	82,407
Artificial Abrasives				
Silicon carbide[2]	30,365	25,346	24,206	33,042
Aluminum oxide[2]	86,401	53,220	50,408	98,531
Metallic abrasives[2]	28,031	25,771	42,015	50,016

[1]Imports; no domestic production. [2]Includes Canada also.

the table, except that the output was supplemented to a minor degree by imports.

Pumice.—In addition to the production of pumice and pumicite reported in the table, U.S. imports of crude material in 1939 were 6,656 short tons, decreasing to 3,758 tons in 1940; imports of manufactures were valued at $29,221 in 1939 and $6,468 in 1940.

Rottenstone.—Produced only in Pennsylvania, and used as a base in polishing compounds, the output of rottenstone is included with that of tripoli.

Sharpening Stones.—The output of sharpening stones shown in the table, including whetstones, oilstones and hones, was supplemented by small amounts of imports.

Sand and Sandstone.—Included in the outputs reported in the article SAND AND GRAVEL, and under *Sandstone* in the article STONE, there were material outputs of ground sand and sandstone, used largely for abrasive purposes, as well as of abrasive sand. About one-quarter of the ground sand and sandstone reported in the table is used in abrasives, while the abrasive sand is used in sand blasting, grinding glass, the manufacture of sandpaper, and other types of abrasive use.

Tripoli.—The output of tripoli reported in the table included also that of rottenstone, a product closely related in both character and uses. Demand in the United States is satisfied almost entirely from domestic sources, imports amounting to about 1% of production.

Artificial Abrasives.—For comparison with the demand for natural abrasives, the output of the chief types of artificial abrasives in the United States and Canada is reported in the table. (G. A. Ro.)

Abyssinia: *see* ETHIOPIA.

Academic Freedom: *see* EDUCATION.

Academy of Arts and Letters, American: *see* AMERICAN ACADEMY OF ARTS AND LETTERS.

Academy of Arts and Sciences, American: *see* AMERICAN ACADEMY OF ARTS AND SCIENCES.

Academy of Political and Social Science, American: *see* AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.

Accidents. The 1941 accident toll in the United States was: killed, 101,500; injured, 9,300,000; the cost, $3,750,000,000.

Huge as it was, the 1941 toll was not the highest on record. In 1936 there were 110,052 deaths, or 8% more than in 1941. The year 1937 also topped 1941. The 1941 death rate per 100,000 population was 76·2. Only 11 of the 40 years up to 1941 had lower rates. The lowest rate was 68·3 in 1921.

The 1941 accidental death totals for the U.S., by classifications, were:

	1941	1940	Change
All accidents*	101,500	96,885	+ 5%
Motor vehicle	40,000	34,501	+16%
Home	32,000	33,000	— 3%
Occupational	18,000	17,000	+ 6%
Public (not motor vehicle)	14,500	15,000	— 3%

*The all-accident totals are approximately the sums of the other figures, minus the duplication of occupational and motor vehicle deaths. This duplication in 1941 amounted to about 3,000. The 1940 all-accident and motor vehicle totals are U. S. Census Bureau figures. All others are National Safety Council estimates.

Increased activity in all fields—largely attributable to the ever-increasing tempo of national defense—was the key to the greater accident toll. Against a backdrop of the nation's pressing need for man power, these facts stood out sharply:

1. The 1941 accident toll among men in the expanded selective service age bracket (20 to 45) was 26,000—equal to the destruction of almost two full army divisions.

2. Approximately 18,000 workers were killed by occupational accidents. An additional 29,000 were killed in off-the-job accidents. This loss of manpower represented labour sufficient to build 20 battleships, 200 destroyers and 7,000 heavy bombers.

Accidents were the fifth most important cause of death in 1941, exceeded only by heart disease, cancer, cerebral haemorrhage and nephritis. One out of every 14 persons in the United States suffered a disabling injury during the year.

The traffic toll of 40,000 was an all-time high. Since traffic deaths went up 16% and travel increased only 11%, the mileage death rate rose 4%. In industry, however, the 6% increase in deaths was far less than the 17% rise in employment in manufacturing industries and the 9% gain in total nonagricultural employment.

The estimated economic loss of $3,750,000,000 covers both fatal and nonfatal accidents and includes wage losses, medical expense, the overhead costs of insurance, and property damage from motor vehicle accidents and fires. There were other large but less tangible losses, such as interruption of industrial production, which cannot be estimated.

Persons 65 years and older were the only group with a better accident record in 1941 than in 1940. Deaths dropped 1% to 27,650. The school child group (5 to 14 years) had a 10% increase, with deaths totalling 7,100. This increase was exceeded only by the 12% rise shown for the 15–24 year group, where deaths totalled 14,250. The 25–64 year group accounted for 45,350 fatalities—a 5% rise. There were 7,150 deaths of children under five years of age, a 4% increase.

Deaths from falls were about the same in 1941 as in 1940—approximately 26,000 each year. Falls are second only to motor vehicle accidents as a cause of accidental death.

Deaths from burns were approximately 6,900 in 1941—a 5% drop from 1940. Drownings increased about 2% to 7,000.

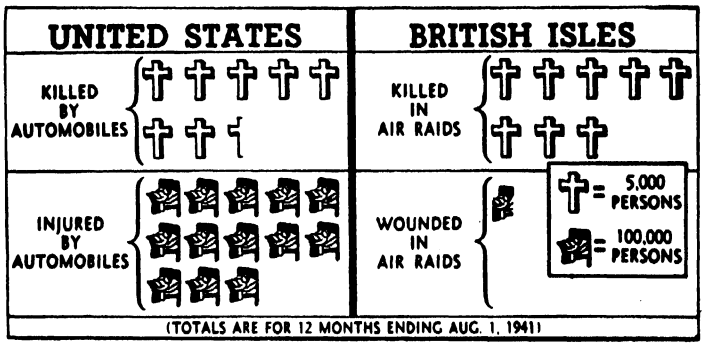
The year 1941 was the first in ten years in which no catastrophe took as many as 100 lives. A Brooklyn, N.Y., ship and pier fire took 37 lives. A picnic boat explosion in Maine killed 36. The number of accidents in which five or more persons were killed was higher, however, than in 1940. This was largely because of multiple-death motor vehicle, military aviation and water transportation accidents, according to Metropolitan Life Insurance company reports. As in other years, nearly all accidents were one-or-two death cases.

The year 1941 can be characterized as a year of mobilization of accident prevention resources. Motivated by the rising accident tolls, President Roosevelt on Aug. 18 designated the National Safety council to lead an all-out attack on accident hazards in every field of activity, but with special attention to accidents involving workers since they constituted an indirect sabotage of the defense production program.

The National Committee for the Conservation of Man Power in Defense Industries, sponsored by the U.S. department of labor, was effective in developing an awareness of accidents, and a determination that they could be prevented, in many branches of industry hitherto unreached by safety materials. (*See* also DEATH STATISTICS; DISASTERS.) (W. H. CAM.)

Traffic Accidents.—The total of 40,000 deaths in 1941 was 5,500 more than in 1940. The death rate on a population base showed an increase of 14.9%. During 1941, 30 persons were killed for every 100,000 population and 12.6 persons lost their lives for each 100,000,000 motor vehicle miles travelled.

While the 16% rise in traffic deaths is attributed in part to an 11% increase in travel, a contributing factor was the 5% increase in the total number of motor vehicles in use. Other contributing factors included the in-



AIR-RAID CASUALTIES of the first full year of German raids on the British Isles, compared with motor traffic casualties in the U.S. during the same period

creased tempo resulting from the national emergency, the loss of trained enforcement personnel to selective service and the conscripting of many experienced professional drivers to military service.

Outstanding achievements in the field for 1941 may be summarized under the headings of the model highway safety program which was developed and endorsed by 12 leading organizations interested in safety in the United States.

Legislation.—Adoption by three additional states (Florida, Utah and Ohio) of the uniform act regulating traffic on highways as drafted by the National Conference on Street and Highway Safety; continued adoption by cities of the model municipal traffic ordinance; passage of bills in a majority of states increasing size of state police agency; passage of acts in two additional states (New York and Oregon) providing for use of evidence obtained through scientific tests for intoxication; speed limits increased early in the year by several state legislatures, but toward the end of the year the trend was reversed as a means of tire and motor vehicle conservation. Several states began the consideration of bills for the control of traffic during blackouts and air raids.

Motor Vehicle Administration.—Establishment by the American Association of Motor Vehicle Administrators and the National Safety council of a joint project for driver improvement through suspension and revocation of drivers' licences.

Enforcement.—Study and development of emergency measures for the control of traffic during possible wartime disaster; stepped-up enforcement to relieve accidents and congestion resulting from increased use of motor vehicles for defense and production purposes; inauguration of the nationwide emergency traffic law enforcement program by the International Association of Chiefs of Police and 11 other national organizations.

Education.—Academic credit courses in safety education conducted in 82 colleges and universities in 33 states during the summer of 1940; courses in driver training offered in approximately 8,000 high schools, 400 of which supplemented classroom work with actual road lessons; inclusion of 300,000 children in grade school safety patrols in 3,500 cities and towns; enlistment by two states of parental co-operation in training student drivers.

Engineering.—Departments established in an increased number of cities and states for the planning of traffic facilities, safeguards and regulations.

Training Personnel.—Inauguration of emergency training courses for police in wartime traffic control; continued increase in the training of traffic safety engineers, educators and enforcement personnel; continued co-operation of colleges and universities in conducting traffic officers' training schools. Principal training agency for educators was the New York University Center for Safety Education; for traffic police, the Northwestern University Traffic institute; for engineers, the Yale University Bureau for Street Traffic Research.

BIBLIOGRAPHY.—Maxwell Halsey, *Traffic Accidents and Congestion;* International Association of Chiefs of Police and Northwestern University Traffic Institute, *The State and Provincial Police;* Institute of Traffic Engineers and National Conservation Bureau, *Traffic Engineering Handbook;* National Safety Council, *The Traffic Court in the Traffic Accident Emergency, Trying Traffic Cases* and committee reports dealing with intoxication, night driving, winter driving hazards, speed, pedestrian control and the bicycle problem. (F. M. K.)

Aden. Aden is a British colony, seaport and territory in Arabia, situated in 12° 45′ N. and 45° 4′ E., including Perim island, etc., in the strait of Bab-el-Mandeb between Africa and Arabia.

Area 80 sq.mi.; pop. (est. 1939) 48,338. Aden protectorate, including Sokotra on the Red sea coast, 112,000 sq.mi.; pop. (est.) 600,000. Governor: Sir J. Hathorn Hall. Language: English and Arabic; religion: Mohammedan.

History.—The collapse of Italian operations in northeast Africa early in 1941 removed from Aden the threat of air raids and, allowing for war conditions, the colony and protectorate enjoyed a comparatively normal year. From the beginning of the war to Dec. 1941, Aden had made war contributions totalling £95,000,528, of which £61,000,900 were contributed in 1941, a particularly generous response in view of the small population. Of the total, £50,000 represented repayment of a government loan, while £45,000 consisted of gifts and contributions to the general war effort. Subscriptions for aircraft, mobile canteens, etc., amounted to £30,000.

In the late summer the chief secretary paid a visit to the king of the Yemen, and the governor represented Aden on the middle east war council set up under the chairmanship of the minister of state, Oliver Lyttelton. Aden was also represented at the conference of the middle east supply centre which opened in Cairo in November.

During the war an Arab chief in the protectorate, the Fadhli Sultan of Shuqra, was deposed for misgovernment and oppressive rule, and was succeeded by a cousin elected by the tribe.

(D. A. C.)

Finance.—Revenue (1938–39) £148,586; expenditure (1938–39) £127,963; currency, legal tender: rupee (Rs.1)=1*s.* 6*d.*=30.3 U.S. cents.

Trade and Communication.—External trade 1938 (merchandise and treasure on private account): imports, by sea, Rs.6,78,60,400; by land Rs.29,40,602; exports, by sea Rs.3,41,45,281; by land Rs.15,95,929; (treasure) imports Rs.1,23,69,439; exports Rs.72,50,784. Communication: shipping (1938), 2,079 merchant vessels (1,361 British) entered, total tonnage 8,650,411 net tons; motor vehicles registered (Sept. 30, 1939), 733 cars and taxis, 207 commercial vehicles.

Production.—(1938–39) Tobacco (approx. value of crop) Rs.500,000; salt 282,994 tons; (export) 248,784 tons; coffee (export) 4,900 metric tons.

Adjusted Compensation: *see* VETERANS ADMINISTRATION.

Adler, Guido (1855–1941), Austrian author and professor of music, was born in Eibenschuetz, Moravia, then part of Austria-Hungary, on Nov. 1. A professor of musical science at the University of Vienna, Adler in 1894 undertook the editing of the *Denkmäler der Tonkunst in Österreich,* a publication of Austrian musical works, which in 1941 was in its 90th volume. He was the author of books on Richard Wagner and Franz Joseph Haydn, and while at the University of Vienna founded an institution for musical history. Adler died in Vienna in February.

Adult Education: *see* EDUCATION.

Advertising. The lend-lease program, priorities and finally entrance of the United States into World War II were the dominating factors in business and, consequently, in advertising in 1941. Priorities and shortage of certain materials, particularly metals, began to affect certain classes of goods. Continuance of the war kept advertising activity in the United Kingdom at about half its normal level. Advertising rates rose to offset in part the smaller volume. In the United States, advertising expenditures were $1,736,000,000 in 1941, an increase of 4·6%. Newspaper linage increased 3·8%; radio, 11·0%; magazines, 3·3%; outdoor, 11·1%; farm papers, 0·5%. Direct mail advertising volume increased 5·8%. These estimates are based upon studies reported in *Printers' Ink.*

Governments used advertising on a larger scale than ever before for increasing enlistments in military service and for the sale of bonds. Great Britain and Canada sold bonds at the low selling cost of 1·5%. The U.S. treasury engaged an experienced advertising consultant for the defense bond campaign.

South America.—Considerable progress was made in the standardization of space rates. The rate situation had been rather chaotic. Although rate cards were published, they were regarded as the basis of energetic dickering which usually resulted in securing sizeable reductions by the more persuasive advertisers. This was no longer the case in 1941. Card rates held for all. The circulation of many papers in new industrial areas increased greatly. This resulted in the installation of high-speed presses and improved printing. There was no guarantee of circulation statements by publishers and there was no prospect of establishing independent audits of circulation. One peculiarity of the South American field was the supplying of radio talent by the station management without extra charge. In the United States, radio talent is specifically paid for by the advertiser.

Copy and Layout.—There was an increasing use of humour. In the past, humour had been handled cautiously and sparingly. This trend began in 1940 and continued with greater strength in 1941 in the growing use of humorous situations, the injection of humour into the strip continuity, and the use of already established comic personalities.

While defense and war had produced important effects, they had not, however, turned advertisers away from product selling. In a survey it was estimated that only 4% of advertisements were not built around product selling. The other 96% were directed definitely at selling goods and services. The 4% of advertisements tied in with war and defense fell into two groups. The first group consisted of advertisements which showed either a man in uniform using the product or a military scene in the background. The second group consisted of advertisements of companies devoted entirely to the making of war goods. These advertisements were usually institutional and described the contribution of the company to the defense effort. Some companies, although they had no goods to offer to the public, still advertised their products on the ground that they would be available as soon as the war was over.

The Federal Trade commission continued its surveillance of advertising, causing advertisers to be cautious in the use of product claims.

Radio.—Advertisers in the United States spent $107,500,000 for time on the three major networks in 1941, an increase of 11%. In addition they spent $35,000,000 on programs, an increase of 24%. This increase was due in part to some shifting from quiz programs, which are relatively inexpensive, to the more costly variety shows. News broadcasts greatly increased with the spread of the war, by means of listening posts in the U.S. and a large staff of correspondents throughout the world. Advertisers capitalized on this interest by increasing their commercial sponsorship of news. Stations and sponsors contributed generously of their time to the defense effort. The "Treasury Hour" was perhaps the most important one. It was estimated that stations on the average devoted 760 min. and 227 announcements to the defense effort in the month of July 1941 alone. With the entry of the United States into the conflict, most stations entered on a 24-hr. schedule and broadcast news every hour or half hour. Radio achieved its largest audience, estimated at 90,000,000 persons, with the broadcast of Pres. Roosevelt's address on Tuesday, Dec. 9. (*See* also RADIO.)

Newspapers.—Total circulation of daily and Sunday newspapers reached an all-time high of 41,500,000 copies, a gain of 2% over 1940. During the year, the *Chicago Sun* was founded. There was some increase in the use of colour in newspapers. (*See* also NEWSPAPERS AND MAGAZINES.)

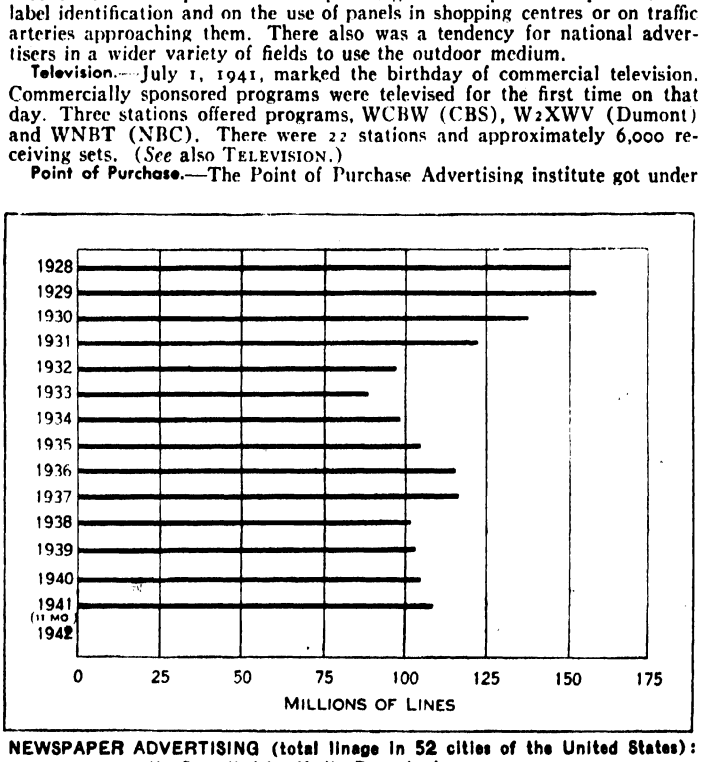
Magazines.—Twenty-one leading magazines issued a total of 1,103,000,000 net paid copies during the 12 months ending June 30, 1941, a gain of 5.5% over the corresponding 1940 period. Two or three magazines began to distribute their copies in substantial numbers by air express in South America.

Direct Mail.—There were no material changes in expenditure for direct mail, in number of advertisers using this medium, in postal regulations or in methods of mechanical reproduction. However, there was a reduction in novelty mailing pieces due, probably, to their greater cost. There was much publicity concerning the over-use of the congressional franking privilege, referred to in the press as the "franking fraud." It was alleged that congressmen condoned the use of their franking privilege by pressure groups of both American and foreign origin. Users of direct mail felt that it decreased the effectiveness of their own mailing pieces because of the competition for attention with franked propaganda.

Outdoor.—The year 1941 was marked by a practically complete standardization of structures and services. This was due partly to the Outdoor Advertising association and partly to the extension of the services of the Traffic Audit bureau which audited practically every outdoor plant in the United States triannually. Every panel was given a rating by the bureau and plant operators undertook to re-locate low-rated panels in places where they would receive higher ratings. With this standardization of ratings, the purchase of outdoor advertising circulation became comparable to the purchase of space and time in other major media. The growth of self-service merchandising, the increase in super-markets and the expanding use of open display in all types of retail outlets reduced or eliminated salesclerk influence on consumer purchases and placed greater emphasis on product and label identification and on the use of panels in shopping centres or on traffic arteries approaching them. There also was a tendency for national advertisers in a wider variety of fields to use the outdoor medium.

Television.—July 1, 1941, marked the birthday of commercial television. Commercially sponsored programs were televised for the first time on that day. Three stations offered programs, WCBW (CBS), W2XWV (Dumont) and WNBT (NBC). There were 22 stations and approximately 6,000 receiving sets. (*See* also TELEVISION.)

Point of Purchase.—The Point of Purchase Advertising institute got under way and endeavoured to provide information regarding this medium, to check on sales effectiveness of displays and to co-ordinate this form of advertising with other media.



NEWSPAPER ADVERTISING (total linage in 52 cities of the United States): average per month. Compiled by Media Records, Inc.

If something looks suspicious around the place, report it Quietly and Promptly to the Boss ...It may be important! Have it checked by *EXPERTS*...*It's Safer!!*

★ ★ ★

You are a *PRODUCTION SOLDIER*... America's First Line of Defense is *HERE*

HUMOROUS POSTER with a serious message, drawn by Cyrus Hungerford in 1941 for display in U.S. defense plants

Retail Advertising.—The major development was the increase in the amount of information the retailer was required to give. Under the labelling act administered by the Federal Trade commission, textiles, for example, must be labelled to show the percentages of the different kinds of materials in them. Drugs, likewise, must be properly described. Another outstanding trend in retailing was the growth of the cash-and-carry system and self-service in department stores. The variety chains originated the movement some years ago. Super-markets grew by leaps and bounds during 1941. There was even a tendency to use self-service in women's ready-to-wear stores and in basement sections of department stores. Ways were being devised so that customers might examine practically all of the stock without need of salespersons. Complete labelling and more factual advertising became a part of the movement.

After the fall of France and the disappearance of Paris as the fashion centre, the New York Dress institute was organized and made an aggressive start toward establishing New York as the world's fashion centre by inaugurating an extensive advertising campaign.

Consumers.—The year 1941 witnessed a widening interest of consumers in their economic role as consumers. Objectives of the "consumer movement" became integral parts of the thought and action of consumers in 1941. Although these activities received impetus from the defense programs, none was initiated solely because of defense. Heading the list of activities was consumer education, including choice-making, market selection, use and care of products and emphasis upon the relation of the consumer to the economic order. Numerous educational units were organized, including women's clubs, local consumer groups, church groups, co-operatives, community centres and defense-inspired consumer councils. Emphasis was placed on conservation and reduction of waste. Consumers were being educated to select essential goods, to have more concern for the use and care of appliances, to salvage used materials, to understand the importance of national resources, national defense and nutrition, to check the abuse of the returned-goods privilege, to cut down on deliveries and to perform some of the distribution services themselves.

Consumers were insisting more upon facts to guide them in buying and in the use and care of products, through more informative advertisements, better-informed salespersons, informative labels, grade labels and buying

guides. The demand for standards increased with the growing scarcity of goods. Consumers became less reformist toward business and more realistic and willing to co-operate with business groups, as witnessed, for example, by the Committee on Consumer Relations in Advertising and the National Consumer-Retailer council.

Consumer groups were also interested not only in the enactment of protective legislation but also in securing a voice in the administration of such measures through the growing demand for a federal department of the consumer in the cabinet.

There was clear evidence of a shift in consumer income. The net spendable income of the higher and middle groups was being reduced by heavier taxes. The lower groups were less affected by taxation and were receiving a larger share of the gross dollar income. Many marginal consumers were being brought into the active spending groups.

Research.—An outstanding achievement was the completion of the four-year study of the economic effects of advertising under the direction of Neil Borden and an advisory committee of the Harvard Graduate School of Business Administration. The study was financed by a grant by Mrs. A. W. Erickson as a memorial to her late husband who had been a noted advertising agency executive. It was carried out under the auspices of the Advertising Research foundation.

The findings of this research are set forth in a volume of nearly 1,000 pages.

The year 1941 also marked the completion of ten years of continuous measurement of the readership of advertisements in magazines, known as the Advertising Rating Service, conducted by Daniel Starch and staff. In this continuing program, approximately 120,000 individual interviews are conducted each year. The reports give the number of readers attracted by each advertisement in the magazines covered and the per-reader cost.

BIBLIOGRAPHY.—Among the 1941 books on advertising and related fields were: Neil H. Borden, *The Economic Effects of Advertising;* A. J. Brewster and H. H. Palmer, *Introduction to Advertising* (4th ed.); K. M. Goode, *Advertising;* H. W. Hepner, *Effective Advertising;* O. Kleppner, *Advertising Procedure* (3rd. ed.); W. A. Lowen and L. E. Watson, *How to Get a Job and Win Success in Advertising.* (D. ST.)

Afghanistan. A Muslim kingdom lying between India and Persia; area 250,000 sq.mi.; pop. (est. 1937) 10,000,000; chief towns: Kabul (cap., 80,000), Kandahar (60,000), Herat (50,000), Mazar-i-Sharif (30,000). Ruler: Muhammad Zahir Shah; languages: Persian, Pushtu, and some Turki in the north; religion: Mohammedan.

History.—Under its enlightened monarch the country was advancing steadily in education and in the industries which are expected to exercise a civilizing influence on its turbulent people. But endeavours to stir up trouble were not lacking. The ex-Amir Aman-ul-lah was hanging on to the other side of the frontier and was believed to be under nazi orders to foment disaffection. The faqir of Ipi, an old campaigner among the tribes, was also intriguing. The king, however, was most correct in his neutrality, and his handling of the German colony in the country in the closing months of 1941 gave proof of his sincerity. German nationals organized themselves as a foreign branch of the nazi party, and were developing active pro-Hitler propaganda on the approved fifth-column lines. Their position was one of some strength; they were employed as experts in economic development and in education, as engineers and as suppliers of machinery and plant for industrial enterprises. On British representations, however, the government ordered the deportation of all German and Italian nationals; and a considerable danger to India was thus averted. During the year, Sir Francis Wylie succeeded Sir William Fraser-Tytler as British minister at Kabul. (ME.)

Education.—Elementary schools exist throughout the country, but secondary schools exist only in Kabul and provincial capitals; both are free. There were, in 1940, 130 primary schools and one normal school for teachers in Kabul. In addition there were 4 secondary schools and 13 military schools. Technical, art, commercial and medical schools exist for higher education. The Kabul university was established in 1932; only a medical faculty existed in 1940.

Defense.—Army, compulsory service; peace strength 60,000.

Finance.—Revenue and expenditure about Rupees (Afghan) 150,000,000; currency: Rs. 3.95 (Afghan) = Rs. 1 (Indian). Rs. 1 (Afghan) = 5*d.* approximately, or about 8.4 cents, U.S.

Trade and Communication.—(1939–40) Exports to India: Afghan merchandise Rs. 3,97,06,681; treasure Rs. 16,655; non-Afghan merchandise Rs. 2,008. Imports: Indian produce Rs. 72,79,399; other produce (imported through India and in transit) Rs. 1,96,25,197.

Persian lambskin is one of the most important exports. Other exports are carpets, fruit, wool and cotton. Roads: trade routes, Kabul to Peshawar (India), 210 mi., and Kandahar to Chaman, 70 mi.; there were about 2,265 mi. of unmetalled roads connecting the chief towns. At the beginning of 1941 there were five wireless stations in the country.

Agriculture.—Wheat, rice, millet, maize, sheep, Persian lambskin, wool (1938) 6,800 metric tons.

BIBLIOGRAPHY.—Sir Percy Sykes, *A History of Afghanistan,* 2 vols. (1940).

A. F. of L.: *see* AMERICAN FEDERATION OF LABOR.

Africa, British East: *see* BRITISH EAST AFRICA.

Africa, British South: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

Africa, British West: *see* BRITISH WEST AFRICA.

Africa, French Equatorial: *see* FRENCH COLONIAL EMPIRE.

Africa, French West: *see* FRENCH COLONIAL EMPIRE.

Africa, Italian East: *see* ITALIAN COLONIAL EMPIRE.

Africa, Portuguese East and West: *see* PORTUGUESE COLONIAL EMPIRE.

Africa, Spanish West: *see* SPANISH COLONIAL EMPIRE.

Africa, Union of South: *see* SOUTH AFRICA, THE UNION OF.

Agricultural Adjustment Administration: *see* AGRICULTURE.

Agricultural Chemistry and Engineering, U.S. Bureau of: *see* CHEMISTRY AND ENGINEERING, AGRICULTURAL, U.S. BUREAU OF.

Agricultural Machinery: *see* FARM MACHINERY.

Agricultural Marketing Service: *see* AGRICULTURE.

Agriculture. **Crops.**—Following the severe droughts of 1934 and 1936, the United States had five consecutive years of exceptionally good crops. During these five years, total production of 53 important crops ranged from 4% to 13% above the 10-year average, 1923–32. Probably never before have there been five consecutive years of such good crops.

These five crops would have been even larger had the acreages of the '20s been planted. Acreages were 3% to 8% below those of 1923–32, whereas yields were 13% to 21% above the ten-year average. The increase in yields more than offset the decrease in acreage. The year 1941 brought the highest yields and the second largest production in history.

The 1941 production and yields of wheat, corn and sorghum were the best from 1936–41 (Table I). The only major crops with relatively low production for 1941 were cotton and tobacco. The small crops of cotton and tobacco were due in part to smaller acreage and in part to lower yields.

On the whole, the United States had been favoured since 1936 with good weather conditions for crop production. The good weather more than compensated for attempts to decrease production. Hence the nation was indebted to weather for placing it in a strong position for meeting extra wartime demands.

Livestock.—The severe droughts of 1934 and 1936 caused a drastic liquidation of the numbers of livestock on farms in the United States. With five consecutive good grain crops, forage crops and pasture that followed the droughts, stockmen restored their herds as rapidly as feed and breeding practice permitted.

The index of meat animals on farms rose from 103 on Jan. 1, 1937, to 112 in 1941 (Table II). The numbers of animals on farms Jan. 1942 were even higher. The supply of meat animals on farms in 1941 was 12% greater than during the ten years preceding the drought, greater than the peak year of the '20s, and much greater than at any previous high point in history.

The greatest expansion and contraction were in numbers of hogs. The largest number of hogs during the '20s, 69,000,000, dwindled to 43,000,000 after the droughts of the early '30s (Table II). However, with the good corn crops of 1937 to 1939, the number increased rapidly, reaching 60,000,000 by 1940. Beef cattle numbers declined from a high of 40,000,000 during the '20s to 31,000,000 during the '30s. Since 1939 they have steadily increased. The numbers of dairy cattle have increased steadily regardless of droughts. The total number of cattle in 1941 was 10% above the drought level and about the same as the high point of the '20s. Numbers of sheep and lambs have steadily increased since the '20s and were in 1941 near the highest in history.

By 1941 the index of meat animals per capita, 101, had risen to slightly above the average of 1923–32. Even though per capita numbers of livestock were high relative to drought years, they were considerably below the high point of the '20s, 122. Although the total supplies of meat animals were the highest in history, the amount of meat available to each individual was considerably less than the peak of the '20s and much less than the earlier peaks. (*See* also LIVESTOCK.)

Prices.—The outstanding phenomenon of the agricultural situation during 1941 was the sharp rise in prices of all farm products. During the year ending in Sept. 1941, United States farm prices rose more than 40%. The rise was widespread. The greatest percentage advances occurred in prices of cotton and hogs, which rose 91% and 80%, respectively. Most farm products rose from 30% to 50%.

The products which rose the most were not necessarily those with the highest prices. For example, in Sept. 1941, prices of cotton and hogs were very little more than the average of all farm products. Hogs were not as high as lambs or beef cattle. In general, prices of livestock and livestock products were much higher than grains and other foods.

Table I.—*Crop Production in the United States*

Crop	1923–1932 average	Drought 1936	Five good crop years				
			1937	1938	1939	1940	1941*
Corn, million bu.	2,583	1,507	2,651	2,562	2,602	2,461	2,673
Wheat, million bu.	830	627	876	932	751	812	946
Oats, million bu.	1,237	786	1,162	1,068	936	1,246	1,176
Barley, million bu.	233	147	220	253	275	310	359
Rice, million bu.	40	50	53	53	54	54	54
Grain sorghums, million bu.	100	55	98	90	83	128	154
Soybeans, million bu.	9†	30	45	63	91	77	107
Potatoes, million bu.	360	332	395	374	303	378	358
Apples, million bu.	101	76	116	82	143	114	126
Hay, million tons	72	64	73	81	76	85	82
Cotton, million bales	14	12	19	12	12	13	11
Tobacco, million lb.	1,377	1,155	1,503	1,376	1,858	1,456	1,280
Index of 53 crops	100	79.5	112.6	105.5	103.0	108.1	111.0

*December 1 estimate. †1924–32 average.

The rise in prices of farm products was due to a combination of several factors. Higher government loan rates for products sealed under the farm program contributed to increased prices of grains and cotton. Purchases by the government for British account raised prices of certain livestock products. A short crop, high domestic consumption, and rigid restriction on sales of government-held cotton raised cotton prices.

Some persons contended that the advance in farm prices was due to increased consumer purchasing power. However, it is doubtful whether the demand for food increased with incomes. The additional incomes went for automobiles, clothing and other nonfood items.

One of the reasons farm prices in the United States rose was that world prices of these products rose. Since the gold content of the dollar was fixed, United States prices necessarily followed world prices. World prices rose probably because production in war areas declined and because the demand for food products rose relative to the demand for money. (*See* also PRICES.)

Parity Farm Prices.—The concept of a parity for farm prices was developed during the depression of the early '30s. At that time, prices farmers received were only about one-half the prices they paid for articles bought. It was argued that prices should be raised so that farmers would have as much purchasing power in terms of things they bought as they had during 1910–14. Farm prices have tended to be high relative to farm costs when the general price level was rising; and low, when falling.

The period 1910–14 was chosen as one during which a normal relationship existed between farm prices and costs because the price level was relatively stable following a period of gradual advance. When the price level fell from 1920 to 1932, prices that farmers received fell more rapidly and by a greater amount than prices they paid. Thus, the purchasing power of farm products declined to about one-half of parity. Since 1932 the various farm programs have aimed at restoring parity farm prices; that is, a purchasing power equal to 1910–14. The purchasing power of farm prices rose sharply with the droughts of 1934 and 1936 (fig. 1). Farm prices almost reached parity during a brief period in the spring of 1937, but net farm incomes did not reach parity because of the very low production during the drought years.

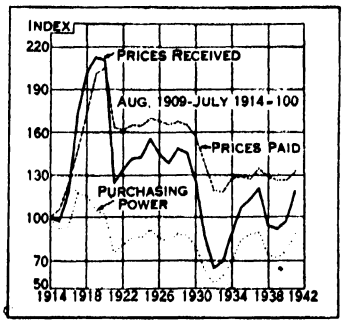


Fig. 1.—INDEX NUMBERS OF PRICES RECEIVED BY FARMERS FOR FARM PRODUCTS, PRICES PAID (INCLUDING INTEREST AND TAXES), AND THE PURCHASING POWER OF FARM PRODUCTS, 1914 to 1941. Prices received by farmers fluctuated more violently than prices of articles they bought. With deflation, the purchasing power of farm products fell; and, with rising prices, it rose

From Aug. 1939 to Oct. 1941, farm prices rose from 70% to 101% of parity. At the same time, production levels continued high. As a result of parity prices and good crops, farmers probably received parity incomes in 1941 for the first time since 1919.

During 1941 there was much controversy over the level of prices fair to farmers. In the debates on price fixing, some persons contended that there was no justification for farm prices as high as parity. It was argued that the 1910–14 base period was one of abnormal prosperity for farmers. It was contended that, since farm prices had been below parity for two decades, their *normal* level should be lower than 1910–14. It was not recognized that farm prices were low during the '20s and '30s primarily because of the effect of falling prices on the price structure rather than because of any fundamental changes in agriculture. The low purchasing power of farm prices during those years was not normal. This is further indicated by the fact that, when the general price structure rose during 1941, farm prices reached parity in spite of large crops. With a further rise in the general price level, it was to be expected that farm prices would rise to 110% to 115% of parity, or even higher. The most justifiable level of farm prices may not

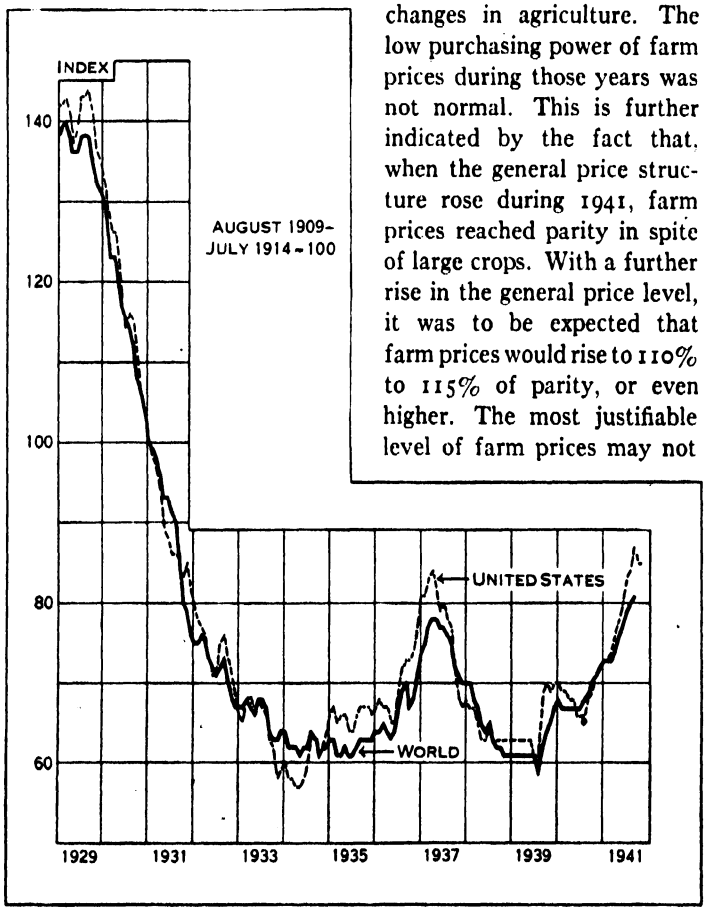


Fig. 2.—INDEX NUMBERS OF PRICES OF 40 BASIC COMMODITIES FOR THE UNITED STATES AND THE WORLD, IN GOLD, 1929 TO 1941. From 1929 to 1933, United States prices fell with world prices; from 1935–37 and 1939–41, they rose with world prices

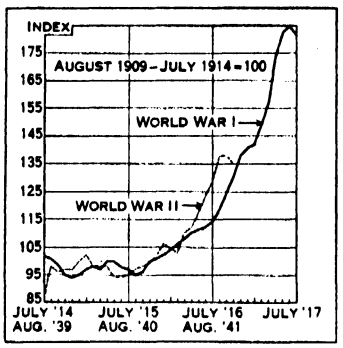


Fig. 3.—INDEX NUMBERS OF FARM PRICES OF ALL FARM PRODUCTS IN THE UNITED STATES, WORLD WAR I AND WORLD WAR II. During the first 24 months of World War II, prices paid to producers for farm products followed approximately the same course as that for World War I

be the low level of 1921 or 1932 following deflation, nor the high levels of 1917–18, nor some high level in the early '40s following inflation. The best estimate of equitable prices for farmers must be made from some period such as 1910–14 when the whole price level was in equilibrium.

In 1941 the 1910–14 farm price relationships were defined by law as parity; that is, these relationships purported to place agriculture on a parity with other industries. However, there is considerable justification for farm prices which would give farmers more purchasing power than in 1910–14. For more than a century prior to 1910 the purchasing power of farm prices had gradually risen. With declining per capita food production, this upward trend should have continued. Of course it was interrupted by the maladjustments in the price structure following World War I. However, in the long run, the upward trend will probably continue. Higher purchasing power for agriculture is also justified by the higher purchasing power of city workers. At the same time that farm prices reached parity during the summer of 1941, the purchasing power of city wages in terms of city costs of living rose to 84% above parity. City wages were above parity continuously during the '20s and '30s. In view of these facts, it would seem that the rising farm prices of 1941 merely restored to farmers a part of their rightful standard of living.

Table II.—*Number of Livestock on Farms in the U. S., January 1942*

Year	000's omitted					Index of number of meat animals	
	Sheep and lambs	Hogs and pigs	Beef cattle	Dairy cattle	Chickens	Total	Per Capita
1923–32 average	44,800	59,000	30,200	32,000	446,000	100	100
Low year of '20s	36,800	52,100	26,200	29,800	370,000	94	96
High year of '20s	48,400	69,300	40,100	31,900	475,000	107	122
1937, after droughts . .	52,500	42,800	31,500	35,300	420,000	103	95
1938	52,700	44,200	31,000	35,100	387,000	103	94
1939	53,800	49,300	30,900	35,900	413,000	105	95
1940	54,500	60,200	32,200	36,000	429,000	111	101
1941	55,000	53,000	34,300	37,400	414,000	112	101

World and United States Prices.—The spectacular rise in prices of farm and other basic commodities during 1941 was world-wide (fig. 2). Prices in the United States merely followed the trend of prices in other countries. In terms of gold, prices have usually been about the same in different parts of the world. By 1934, both world and United States prices in gold had fallen to one-half their 1929 level. Both made a moderate recovery from 1934 to 1937, but lost these gains from the spring of 1937 to the summer of 1939. From the outbreak of World War II to the fall of 1941, both the United States and world prices had risen 40%, back to the peak of 1937.

As long as the United States price level in gold is tied to the world price level in gold and the dollar is a fixed amount of gold, United States prices in terms of dollars will also be tied to world prices in gold. This is a very simple but important principle not commonly understood or taken into consideration in efforts to control prices.

The efforts of neither the Farm board of the Hoover administration nor the AAA program of the Roosevelt administration were

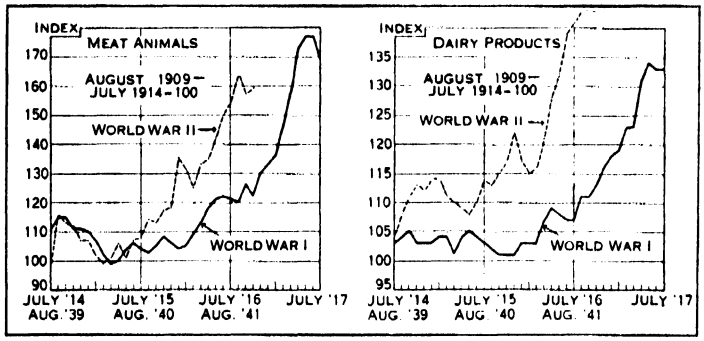


Fig. 4.—INDEX NUMRERS OF FARM PRICES OF MEAT ANIMALS AND DAIRY PRODUCTS FOR WORLD WARS I AND II. During the second year of World War II, prices rose more rapidly and by a greater amount than during the same period of World War I. This held true for both meat animals and dairy products

successful in raising world prices or raising United States prices in gold relative to the rest of the world. Similarly, efforts to curb advancing prices in 1941 were, and would probably be in 1942, harassed by an advancing world price level.

Prices during World Wars I and II.—During the first 24 mo. of World War II, world and United States prices of basic commodities rose about the same amount as during the comparable period of World War I. Similarly, United States farm prices rose about the same amount during the first two years of both wars (fig. 3). The rise in farm prices during World War II was a little greater than during World War I, because farm prices were especially depressed relative to other prices at the outbreak of World War II.

During the first 24 mo. of World War II, prices of meat animals rose much more rapidly than was the case in World War I (fig. 4, left). Prior to World War I, the United States raised more meat than it consumed. However, prior to World War II, consumption was practically equal to production. The United States had less meat to spare at the outbreak of World War II than at the beginning of World War I. Consequently, additional wartime demands for meat raised prices faster during the later conflict.

Prices of dairy products also rose faster during World War II (fig. 4, right). Prior to 1914, the United States exported small amounts of dairy products, whereas prior to 1939, imports were the rule. Because of the shortage in the United States, the additional demand for export to Great Britain raised prices sharply.

Prices of cotton and cotton-seed, chickens and eggs and fruits during the first part of World War II followed their World War I patterns (figs. 5 and 6). Grain prices rose by about the same amounts during the first two years of both wars. However, the level of grain prices was somewhat lower during 1939 to 1941 than 1914 to 1916.

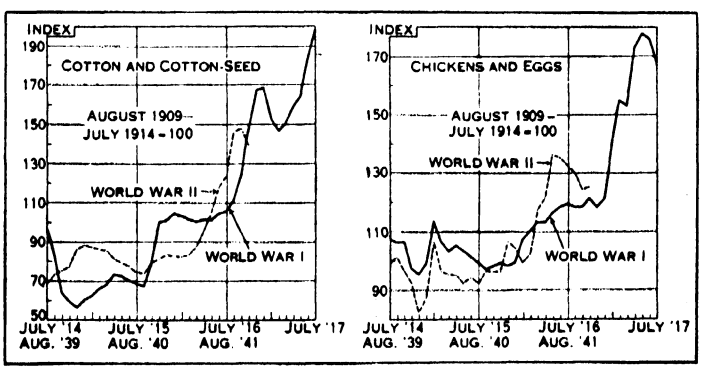


Fig. 5.—INDEX NUMBERS OF FARM PRICES OF COTTON AND COTTON-SEED AND CHICKENS AND EGGS FOR WORLD WARS I AND II. After the first twelve months of World Wars I and II, prices of cotton began to rise. During World War II, the rise was especially sharp during 1941. During the first two years of both wars, prices of chickens and eggs followed about the same course

WHILE THE GERMAN ARMIES drove deeper into the U.S.S.R. in the summer of 1941, women collectivist farmers toiled long hours to get the harvest in before the enemy arrived

AAA Farm Program.—From 1939 to 1941, farmers were operating under the AAA act of 1938, which continued the soil conservation program and commodity loans. The act improved marketing agreements and quotas and added the new features, parity payments, crop insurance and surplus commodity disposal. During these years, greater compliance with the various farm programs was encouraged by parity payments and by the threat or actual existence of more widespread marketing agreements.

In 1939–40 the agricultural program cost the United States almost $1,000,000,000 (Table III). More than half this amount was for conservation payments. The next largest item was parity payments, aggregating $215,000,000. Continental sugar producers collected $27,000,000; and Hawaii and Puerto Rico producers, $20,000,000. The costs of administration averaged about 7% of the payments. The 1940–41 agricultural program cost about the same as the 1939–40 program.

Table III.—*Costs of Agricultural Adjustment Program, Fiscal Year 1939–40*

Agricultural conservation payments	$518,000,000
Parity payments	215,000,000
Payments for purchase of agricultural commodities	67,000,000
Payments under Sugar act	47,000,000
Expenses, county	43,000,000
Expenses, Washington, D.C.	18,000,000
Total	$908,000,000

Table IV.—*Payments to Farmers under the 1939–40 Agricultural Adjustment Program*

Cotton	$215,000,000	Range	$ 14,000,000
Corn	150,000,000	General†	172,000,000
Wheat	138,000,000		$756,000,000
Sugar	47,000,000		
Other crops*	20,000,000		

*Tobacco, potatoes, rice, vegetables, naval stores and peanuts, in order named.
†General division, $71,000,000; and soil-building practices, $101,000,000.

Most of the money paid farmers under the 1939 farm program went to cotton, corn and wheat producers (Table IV). Sugar was also favoured. For all other crops, the farmers collected probably less than 5% of the total; where these crops represented more than half the total value of all crops. The specific payments to cotton producers were about 40% of the value of the crop; wheat, 27%; corn, 10%; and other crops, less than 1%.

The largest payment in any one state went to Texas, $99,000,000 (Table V). There were 11 states that received from $27,000,000 to $61,000,000. In general, the most favoured states were in areas of intensive corn, cotton or wheat production. Payments in southern states were approximately 18% of the farm value of all southern crops; and in northern states, 14%.

Table V.—*Approximate Distribution of Gov't Expenditures to States, 1939–40*

Texas	$99,000,000	North Dakota	$32,000,000
Iowa	61,000,000	Minnesota	31,000,000
Illinois	43,000,000	Oklahoma	29,000,000
Nebraska	37,000,000	Missouri	28,000,000
Kansas	36,000,000	Arkansas	28,000,000
Mississippi	33,000,000	Alabama	27,000,000

40 states and territories, average....$9,000,000

After eight years of AAA programs in the United States, some generalizations can be made concerning their effect on farmers and agriculture.

As a relief measure for farmers, cash payments no doubt raised the standard of living of many farmers relative to the rest of the U.S. These payments were much needed and gratefully received. They were the farm counterpart of city relief cheques. However, unlike city relief, farm payments were given in proportion to reduction in production rather than in proportion to needs.

One of the effects of the AAA program of reducing production was to raise prices. However, raising prices by reducing production did not raise farm income. Prices and production tended to be compensating factors; that is, a large crop at low prices brought about as many dollars as a small crop at high prices. Another effect of reducing production and raising prices in the United States was to encourage high-cost producers in other countries to increase production. Thus the program tended to turn U.S. foreign markets over to foreign producers. To regain these foreign markets, the American farmer could eliminate this foreign competition only by selling his product at unremunerative prices for several years.

It is difficult for a democracy to operate a successful ever-

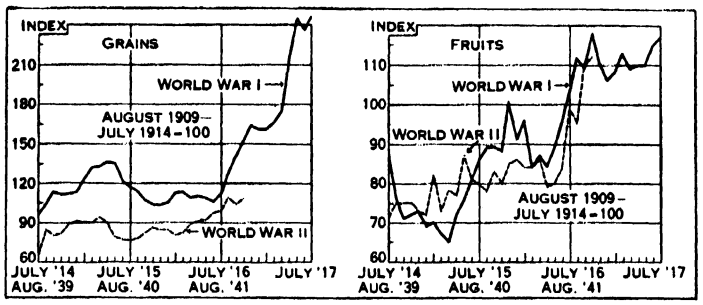


Fig. 6.—INDEX NUMBERS OF FARM PRICES OF GRAINS AND FRUITS FOR WORLD WARS I AND II. During the first two years of World War I and World War II, there was relatively little rise in the price of grains. Prices of fruits followed about the same course during the two wars

normal granary. The tendency is to put everything in and take nothing out. The only salvation for an ever-normal granary is an unpredictable sharp rise in prices because of severe drought, war, or some other force. Schemes for holding crops fail miserably when prices fall for several years. The Farm board, which operated from the late '20s to the early '30s, gave an excellent illustration of an ever-normal granary when prices were falling.

An avowed advantage of the ever-normal granary has been to carry part of large production in good crop years over into poor crop years. However, in the case of cotton, this was formerly done by farmers and the trade. In the case of grains, the excesses of good years were carried over into following crop years largely in the form of livestock. When grain was plentiful and relatively cheap, it was profitable to feed more to the existing livestock. With continued good crops, the numbers of livestock continued large; but, when short crops occurred, feeding was no longer profitable and the slaughter of livestock temporarily increased, thereby reducing the number. During drought years, the livestock produced from current poor crops necessarily declined, but the deficiency was made up from the slaughter of the excess accumulated during the good crop years. Thus farmers tended to operate their own ever-normal granary. They kept the grain in the form of meat animals rather than in corn cribs and grain elevators. In many ways, the farmer's system was preferable to the AAA system because the surplus was kept in a form more quickly available to city consumers and for emergencies, such as additional foreign demands in time of war.

The conservation aspects of the farm program have been effective in encouraging better soil-building practices, reseeding of pastures, erosion control, protective summer fallowing, green manure and cover crops, and the like. Undoubtedly, a somewhat greater-than-otherwise future production has been provided for. Of course it must be realized that this was accomplished at the expense of a somewhat reduced immediate production.

A provision for government sponsored crop insurance was included in the AAA act of 1938. An agency was set up to write insurance against loss in wheat yields. Considerable insurance was written against the wheat crops of 1939 to 1941, particularly in the great plains area. In general, the popularity of this part of the program depended on the size of the crop the preceding year. Where farmers carried insurance every year, their incomes from wheat were more or less stabilized.

From 1935 to 1941, one of the features of the AAA was the Surplus Marketing administration which bought farm products for government account and gave them to those in low-income groups. This action was supposed to serve two purposes: first, to take troublesome surpluses off the markets so that farmers would obtain better prices; and second, to improve the diets of those with low incomes. This part of the AAA program was probably more effective as an urban relief measure than as an aid to farmers. Farmers' benefits depended only on the extent to which

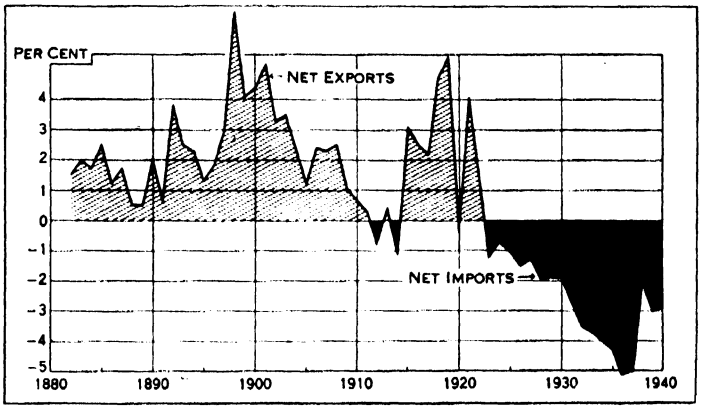
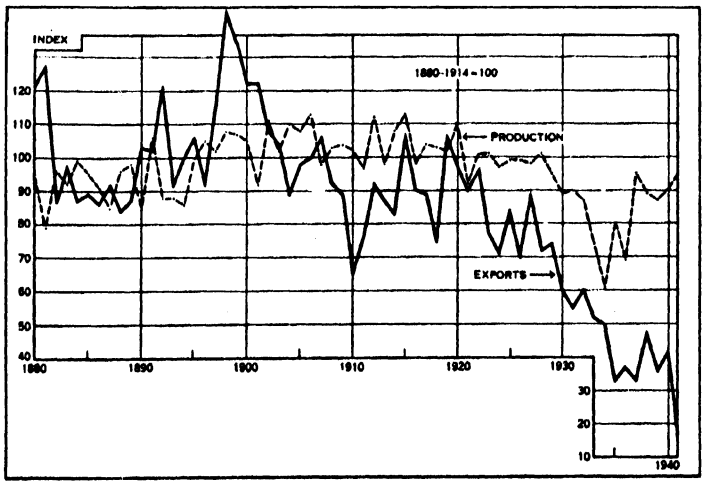


Fig. 8.—VALUE OF NET U.S. EXPORTS OR IMPORTS OF FOOD IN PER CENT OF FARM INCOME, 1882–1940. From about 1890 to about 1900, net exports mounted relative to production. From 1900 to the war in 1914, the excess of exports vanished. During and after the war from 1915 to 1922, there was an excess of exports of food. Since 1923, imports of food have exceeded exports; and in 1936, were 5% of farm income. Even after four good crop years, about 3% more food was consumed in 1940 than produced in the nation

prices were raised. No doubt some prices were raised, but possibly prices of products not purchased under the program were correspondingly lowered. The rise in the average price of farm products depended on the rise in the average food consumption in the U.S. Whether the consumption of the low-income classes was actually increased is debatable. People tend to eat about the same amounts of food whether their incomes are high or low and whether they obtain this food with money from their own earnings, with relief cheques, or directly from the Salvation Army, or the Surplus Marketing administration.

Fig. 7.—INDEX NUMBERS OF THE PHYSICAL VOLUME OF CROP PRODUCTION PER CAPITA AND OF TOTAL AGRICULTURAL EXPORTS OF THE UNITED STATES, 1880–1941. From 1880 to about 1915, there was some tendency for the production of crops per capita to increase slightly. Since that time, they have declined. The physical volume of exports rose to about the turn of the century. Thereafter, a decline set in and continued to 1941. The only interruption was during and immediately following the war from 1915 to 1922



Conflict Over Agricultural Policy.—As a result of the depression and low prices, efforts were made to raise prices by reducing production. As a result of rising prices in 1941, some persons contended that production should be increased to prevent prices from rising.

It has been the AAA policy to restrict production and raise prices. This policy was to continue for 1942 in spite of increased demands for livestock products for export. Although the AAA cooperated with the United States department of agriculture in encouraging increased livestock production during the fall of 1941, the AAA contracts for 1942 called for continued restricted acreages of corn and wheat.

Diametrically opposed to the AAA policy was that of the Office of Price Administration (*q.v.*), which wanted greater production and low prices. Any price control bill is at cross-purposes with the AAA.

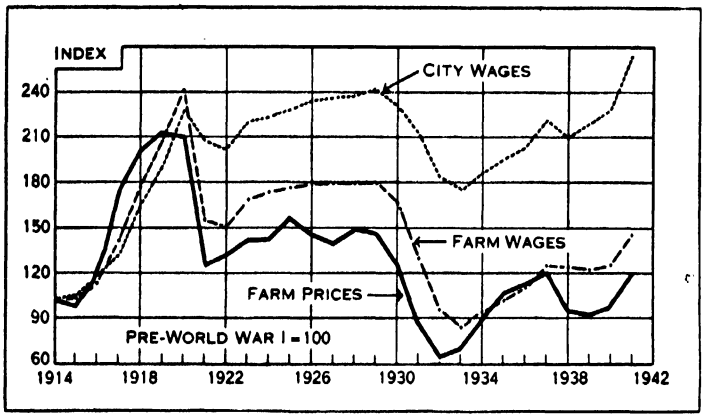


Fig. 9.—INDEX NUMBERS OF FARM AND CITY WAGES AND FARM PRICES, 1914–41. Although farm wages tend to be a compromise between farm prices and city wages, they have followed farm prices more closely than city wages

The price control advocates represent the interest of urban consumers who desire cheap food and clothing.

The interests of the farmer are not represented by either the AAA or the Office of Price Administration. The farmer wants neither low production and high prices nor high production and low prices. He wants high production and high prices. If it were not for the AAA or the Office of Price Administration, he might get both in 1942. High production and high prices would be more to the advantage of both farmers and consumers than any other combination. The interests of the farmer have been represented most truly by the agricultural elements of congress and the United States department of agriculture. The farm bloc in congress has attempted to safeguard the farmer by insisting on what appeared at the time to be fair levels for agricultural price ceilings.

The United States department of agriculture has agreed with the farm bloc on the 110% of parity ceilings. It has also gone as far as it can in advocating increased production without conflicting with the AAA.

The formerly small agency, the Surplus Marketing administration of the AAA, was occupied with purchasing farm products for relief groups. In 1941 this agency expanded rapidly into an organization to purchase food for Britain under the lend-lease program. Prior to 1941, expenditures for relief aggregated $50,000,000 to $75,000,000. Late in 1941, expenditures for lend-lease were at a rate of about $500,000,000 a year. Expenditures in 1942 were expected to reach $1,000,000,000.

For 1942 United States farmers were urged to increase their total production about 7% over that of 1941. This was necessary to provide Britain with the food that it would need. During World War I, Great Britain imported dairy, poultry and pork products from Denmark and the Netherlands. In 1942, this would be impossible. Most of the increases called for were not in crop production but rather in the conversion of good crops into livestock and livestock products.

Table VI.—*Intended Exports of Food for 1942 from the United States*

Commodity	Exports		Increase of 1942 over normal	Increase as a per cent of 1936–40 production
	Actual Average 1936 to 1941	Goal 1942		
Livestock Products				
Milk, million pounds	−208	5,108	+5,316	+ 5
Eggs, million dozens	3	504	+ 501	+15
Pork, million pounds	101	1,350	+1,249	+15
Lard, million pounds	215	640	+ 425	+23
Beef and veal, million pounds	−155	− 80	+ 75	+ 1
Food crops				
Wheat, million bushels	54	30	− 24	− 3
Corn, million bushels	25	10	− 15	− 1
Rice, million bushels	20	25	+ 5	+10
Dry beans, million bags	1	4	+ 3	+21
Canned vegetables, million cases	− 1	3	+ 4	+ 4
Canned fruit, million cases	3	6	+ 3	+11
Nonfood crops				
Cotton, million bales	4.3	1.0	− 3.3	−25
Tobacco, million pounds	410	441	+ 31	+ 2

Exports of dairy products desired for 1942 are the equivalent of 5,000,000,000 lb. of milk (Table VI). These exports of cheese, butter, canned milk, etc., are equivalent to about one pint of whole milk for each Briton, every three days.

The expected shipments of eggs were expected to be about 500,000,000 doz., or three eggs per person per week.

It was hoped that the U.S.A. could supply Britain with 1,350,000,000 lb. of pork and 640,000,000 lb. of lard in 1942. This is equivalent to about two-thirds lb. of pork and one-third lb. of lard per week per capita.

Because the United States eats more beef than it produces, it would not be able to ship Great Britain any beef except at the expense of domestic consumption or from imports from other countries.

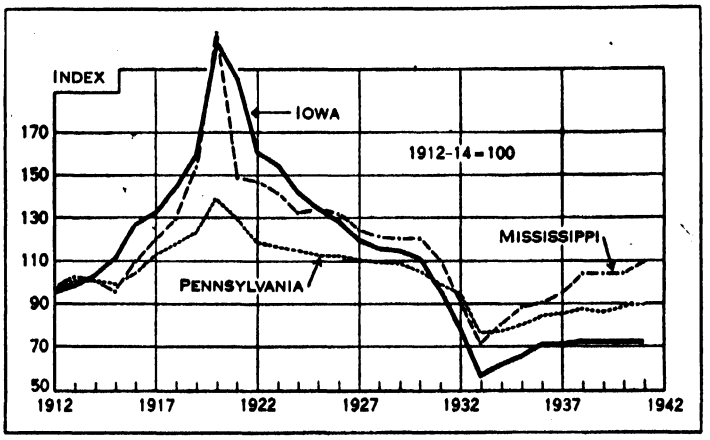
From the standpoint of U.S. agriculture, supplying millions with these products meant an increase in production over the 1936–40 average. The increase in milk and dairy products was 5% of normal production.

Foreign Trade.—Since about 1920, the exports of farm products per capita have been more than halved (fig. 7). This was due primarily to a decline in farm production per capita. Even with the five good crops since 1936, the production per capita has not reached that of the '20s or of the World War I period. Prior to the '20s, the United States produced more food than it consumed, and exports were large. Since then, food production has not kept pace with population, and exports declined and imports rose. Since 1923, the United States, the world's greatest and most efficient food producer, has continuously imported more food than it exported (fig. 8).

Agricultural exports for 1940-41 aggregated about $350,000,000, the lowest in 69 years. Agricultural exports have not only declined in terms of dollars, but have declined even faster relative to exports of other commodities. The 1940–41 agricultural exports declined to 9% of the total exports and to 3% of agricultural income (fig. 8). The decline in exports of agricultural products up to 1941 was due to (a) the long-time tendency for population to overtake food production, and (b) the short-time effects of the blockade of Europe. Most of the short-time reduction was in the exports of cotton. The next most important reductions due to the blockade were in exports of fruits, tobacco, grains, feeds and lard.

Exports of many other farm products increased. For instance, evaporated and condensed milk increased from $3,000,000 in 1939–40 to $20,000,000 in 1940–41. Cheese exports rose $400,000 to $4,700,000. However cheese exports were still only slightly more than imports of cheese. Exports of eggs rose from $1,000,000 to $4,500,000. Although the increases in exports of these live-

Fig. 10.—INDEX NUMBERS OF VALUE OF FARM LAND PER ACRE IN IOWA, MISSISSIPPI AND PENNSYLVANIA, 1912–41. During World War I, land values rose much higher in Iowa and Mississippi than in Pennsylvania. With deflation, land values fell least in Pennsylvania



stock products were relatively great compared with former exports, they were small compared with the decreases in exports of cotton, tobacco, fruits and grains. Likewise, these increases in exports of livestock products were generally small compared with their production.

From 1939–40 to 1940–41, the total imports of agricultural products rose about 20%. Imports of cheese, olive oil, wines and tung oil declined about one-half. Imports of wool trebled. Imports of cocoa increased about 60%; hides, 50% and molasses, 35%. Most of these changes were due to wartime conditions.

In 1940–41 agricultural imports were more than four times exports. About one-half of these imports were products which did not compete with American agriculture, but the other half did. When only farm products produced in the United States are considered, that nation has normally sent abroad a very small excess of $300,000,000 in net exports. This has been about 3% of the total United States farm production.

When all agricultural products raised throughout the world are considered, the United States has had net imports of about 3% of United States production. Net imports of food have averaged about 5% of United States food production.

World Conditions and American Agriculture.—The British attempt to blockade Europe and the axis efforts to blockade Great Britain increased the dangers of ocean transportation and raised transportation rates. This has had two types of effect on American agriculture. First, the exports of farm products, which were previously large, such as cotton, tobacco and fruit, have greatly declined. The largest part of the previous market, continental Europe, has been shut off. Secondly, exports of certain foods, such as livestock products, have increased. Great Britain, which in peacetime obtained these foodstuffs from continental Europe and from distant parts of the world, was forced to buy from the United States because of (1) the blockade of Europe and (2) the shortage of shipping space.

Farm Population.—The total population of the continental United States increased from 4,000,000 in 1790 to 132,000,000 in 1940. During this century and a half, the proportion of persons living on farms or engaged in agriculture declined from about 85% to about 25%.

The farm population increased steadily until 1910 although at no time did it increase as fast as the total population. From 1910 to 1930, the rate of increase in total population slowed, and farm population actually declined about 6%. Increasing efficiency enabled farmers to feed an increasing urban population. From 1930 to 1940, the total population increased, but the farm population remained unchanged.

Normally, there has been a movement of population from farms to cities. Cities have needed an influx of farm population for two reasons. First, industrial activity in the United States has increased rapidly; and second, city people have not borne enough children to reproduce themselves, let alone to increase the population.

In 1940 the urban population produced only 74% of the number of children required to maintain a stable population (Table VII). Farmers have exported a surplus of population to the cities for two reasons: (1) agriculture has not grown so fast as industry; and (2) farmers have raised more children than needed to reproduce their kind. In 1940 the rural farm population produced 44% more children than was required to maintain a stable rural farm population. Farmers have always produced a surplus of replacements because:

1. The cost of raising children was comparatively low.
2. Children were relatively useful on farms.
3. A relatively high percentage of the population was married, and a relatively low proportion was gainfully employed in other industries.
4. Married people living on farms average younger ages than those in cities.

Table VII.—*Net Reproduction Rates (%) for the United States*

Group	1930	1940
Urban	88	74
Farm rural	150	144
Total	111	96

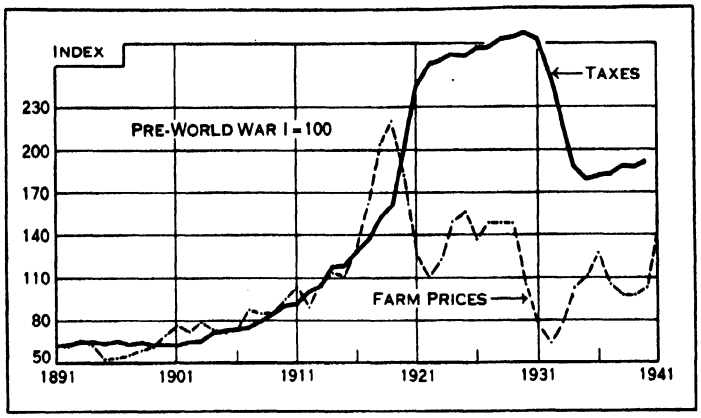


Fig. 11.—INDEX NUMBERS OF TAXES PAID PER ACRE AND PRICES OF FARM PRODUCTS, 1891–1940. Taxes have risen relative to prices. The great depression of the early '30s was the only force sufficient to reduce farm taxes materially

In 1940 the excess farm births were not sufficient to compensate for the deficiency in urban births, and the U.S.A. produced only 96% of the children required to maintain a stable population (Table VII). In 1930, after several years of urban prosperity, the United States was producing 111% of the children required to maintain a stable population. The decline from 111% in 1930 to 96% in 1940 was probably due to the effect of the prolonged depression. Birth rates declined during this period both in cities and on farms. The deficit in the city birth rate increased from 12% to 26%, and the surplus in the farm birth rate decreased from 59% to 44%.

The United States department of agriculture estimates the movement of persons to and from farms. During the urban prosperity of the '20s, the net farm export to cities was 630,000 persons per year. During the next decade, the net movement away from farms averaged only 218,000 persons per year.

The average annual movement away from farms during the '20s, 630,000, was accompanied by a decline of about 1,450,000 in the farm population. During the '30s the net movement declined materially, and the farm population did not change.

The surplus of farm population during the '20s was 485,000 per year. If only this number had been sent to the cities, farm population would have been stable. During the '20s, the surplus all went to the cities, and more went along in addition because urban times were good. However, during the '30s, only the surplus went to cities, because during the urban depression there were few opportunities in cities and the cost of living in cities was high relative to that on farms.

In 1941 high wages in war and other city industries attracted large numbers from farms. Military service also reduced the farm population. It is probable that at least 1,000,000 persons left farms for other work during 1941.

Farm Wages.—During Oct. 1941 the average hired man in the United States received $37.45 per month with board, the highest wage since 1930. Farm wages with board varied from $16 in South Carolina to $62 in California. Farm wages were generally highest in the northwest and in the Rocky mountain and Pacific states and lowest in the south.

During the 12 months, Oct. 1940 to Oct. 1941, farm wage rates rose 28%.

Over the last 30 years, farm wages have been affected by two factors, city wages and farm prices (fig. 9). The upward trend in city wages, plus the competition for labour between cities and farms, have resulted in some rise in farm wages relative to farm prices. However, farm wages have followed the major fluctuations in farm prices. During the depression of the early '30s, farm wages, which declined 60%, were more flexible than city wages, which declined only 32%.

During sharp rises in farm prices, farm wages follow with only a few months' lag. From 1916 to 1917 farm prices rose about 50% and wages 25% (Table VIII). During 1918 wages rose to the level of farm prices in 1917. By the end of the war, both prices and wages had about doubled.

Table VIII.—*Farm Wages and Farm Prices, World Wars I and II*

Year	World War I		Year	World War II	
	Farm wages	Farm prices		Farm wages	Farm prices
1914	100	100	1939	100	100
1915	102	97	1940	102	105
1916	112	117	1941	119*	130*
1917	140	173			
1918	175	200			
1919	205	211			

*Preliminary.

During the first two years of World War II, farm wages again responded to the advance in farm prices. In 1941 farm prices were about one-third higher than the 1939 level; and wages, one-fifth higher (Table VIII).

Farm Land.—The total value of farm land in the United States is about $35,000,000,000. The farm land between the Rocky and Appalachian mountains, north of the Ohio river, is worth almost one-half the total. The farms of the south are worth about $10,000,000,000. The farm lands east of the Appalachians and in the Pacific states are worth about the same, more than $3,000,000,000 in each of the regions referred to. The mountain states, which occupy a large area, are worth about $2,000,000,000.

From pre-World War I to 1920 the United States experienced a spectacular rise in prices of farm products. A part of this rise was reflected in the price of farm land. Farm land in Iowa, Mississippi, and several other central and southern states, doubled in price (fig. 10). In eastern United States, land prices rose 30% to 50%; and in the far west, about 50%. From 1920 to 1933 prices of both farm products and farm land fell disastrously. Iowa land prices fell more than 70%; and Mississippi land prices fell almost as much. On the other hand, land values in the eastern states fell only 20% to 40%.

Relative to their long-time relationship, Iowa land was higher than Pennsylvania land in 1920, but the reverse was true in 1933.

From 1933 to 1941 prices of farm real estate in the United States generally rose. Although land values in the Dakotas and Nebraska fell still further, values in the eastern part of the corn belt and the southern states rose as much as 40% to 50%. In general, land values in Atlantic and Pacific coastal areas rose 5% to 15%.

From March 1, 1940 to March 1941 land values in the United States changed very little, rising only 1%. Southern land values east of the Mississippi rose the most, about 3%. It is probable that land values rose slightly more during the summer of 1941 when prices of farm products rose rapidly.

Farm Taxation.—Farm real estate bears most of the direct taxes paid by farmers. About two-thirds of farm taxes are real estate taxes. Personal property taxes represent about 10%; gasoline taxes and automobile licences about 25%. Other taxes are negligible, about 2% to 3% of the total.

For at least a century, farm taxes in the United States have steadily risen. This long-time increase has been due to expanding expenditures by state and local governments. With passing time, people tend to supply themselves collectively with greater and greater amounts of services. This tendency has persisted throughout most parts of the world. Roads have been modernized with the coming of the automobile. Schools have become larger with more instruction given and better attendance, and school teachers have more training and receive higher salaries.

Although farm taxes have risen with passing time, they have been somewhat related to changes in farm prices. For example, from the Civil War to the '90s, farm prices fell and taxes rose very little. From the '90s to 1914, both prices and taxes almost doubled (fig. 11). During and immediately following World War I, prices more than doubled and so did taxes. During the '20s, farm prices fell, but taxes continued to rise slowly. With the great depression of the early '30s, farm prices were halved and taxes were reduced by one-third. This was the first time for which records are available that farm taxes were materially reduced.

Farm taxes paid in 1941 were slightly above the low point of 1935 but about 30% below the peak of 1930.

Farm Credit.—In 1941 the federal government and semi-governmental agencies had outstanding loans to agriculture upwards of $4,000,000,000, about one-half of which were mortgages on farms. During the year ending June 30, 1941 there was an increase in prices paid to farmers for farm products, and delinquent loans decreased about one-fifth. On June 30, 1940 delinquent Federal Land bank mortgage loans were 19% of outstanding mortgages, compared with 16% June 30, 1941. Altogether, there are about $7,000,000,000 of mortgages on farms in the United States. Individuals and the government each have 40% of the total loans outstanding, life insurance companies, about 13%; and commercial banks and joint stock land banks, the remainder. Since 1930 there has been a steady decline in farm mortgage foreclosure sales in the United States. Foreclosure sales declined from 93 per 1,000 farms mortgaged in 1934 to 14 in 1940. Because of high prices of farm products, foreclosures in 1941 were still less. In addition to land mortgages, the government lends funds to co-operatives. Sept. 1941 there were $105,000,000 outstanding. Co-operatives borrowed almost twice as much money in 1941 as in 1940. The government also makes short-term loans to farmers for various types of production credit. These loans aggregated about $1,000,000,000 in 1941.

The amount of mortgage loans made in the nine months ending Sept. 30, 1941 was only 3.3% of the mortgages outstanding; whereas, in the case of loans to co-operatives and production loans to farmers, the loans were a little more than the outstanding loans.

The Farm Security administration was organized to assist farmers who could not obtain credit through other agencies. They lend funds for a 40-year period at 3% for practically the total value of the real estate and chattels. They make loans for the operation of a farm and its purchase. Most of these loans are in the south to aid tenants to become landowners and to aid small landowners to make a living. There were in 1941 about 13,000 loans, averaging about $5,800.

Farmers also received government credit through crop and feed loans, rural electrification loans, and commodity loans under the AAA.

Probably at no other time in history have farmers had the credit facilities that were available in 1941. (*See* FARM MORTGAGES; COMMODITY CREDIT CORPORATION.)

Experiment Stations.—Since agriculture is an industry with small units, the individual farmer cannot carry on research work concerning the many problems of agriculture, nor even on those peculiar to his farm. For this reason, the United States and most other countries of the world have developed experiment stations to study problems of pure and applied science in agriculture.

For three-quarters of a century there has been a gradual expansion in the number of such agencies and in the type of work undertaken. In 1941 there were agricultural experiment stations in the 48 states, Alaska, Hawaii and Puerto Rico. These institutions have about 4,600 workers conducting research on more than 8,500 projects. The work costs about $21,000,000, one-third of which is supported by federal appropriations and two-thirds by state funds. The average cost of this work is about $3 per farm.

(F. A. PE.; K. R. B.)

Great Britain.—The system of state control of British farming, exercised through the agency of county war executive committees, was continued during 1941 and was extended to embrace almost every section of the industry. The general objective remained unchanged; this was to increase the output of essential food crops—especially wheat, oats, potatoes, beet sugar and the more productive and nutritious vegetables—along with milk and other dairy products. The means used, which were many, included the following:

First, a considerable area of land that had become derelict was reclaimed. This involved large-scale drainage operations, the clearing of wide areas of scrub, the application of mass doses of lime and fertilizers and the use of special plows and other heavy implements of tillage. The necessary dredging and bush-clearing equipment and track-laying tractors were produced in Britain in considerable numbers and others were imported. There were some quite spectacular achievements, and the total result was highly satisfactory.

Second, the year's program included the plowing up of a further 2,000,000 ac. of grassland for arable cropping. Despite difficult seasonal conditions the program was more than completed, thanks largely to the generous supply of tractors and implements from the United States, Canada and Australia.

Third, there was an intensive drive to raise the general level of farming—by better cultivation combined with the use of increased quantities of lime and fertilizers. There was a greatly increased British output of nitrogen compounds and of lime, with increased imports of phosphate rock. These fertilizers were offered at low prices in order to encourage their use. Potash was the only fertilizer that was not freely available, and special measures had to be taken to restrict its use to specially deficient soils and to highly responsive crops. The inspection of farms by the war agricultural committees was tightened up; farms were classified as "A," "B" and "C," and the last group was kept under fairly constant supervision. A considerable number of inefficient farmers were deprived of their farms.

Fourth, much thought had to be given to the numbers of farm livestock that the land could maintain under the changed conditions. Apart from the large loss of grazing area and of hay meadow, there was a heavy reduction—from about 8,000,000 to about 3,000,000 tons—in imports of animal feeding stuffs. Dairy farmers, and also owners of high-class pedigree stock of all kinds were encouraged, by rather liberal allowances of feeding stuffs, to maintain or even to increase the number of their animals. Conversely, the reduction of commercial pig herds and poultry flocks was enforced by reducing food allowances. A further measure was the use of compulsory powers for the slaughter of poor and unhealthy cattle.

Finally, there was an intensive campaign for the utilization of many by-products. Surplus grass was converted into silage; considerable quantities of straw were converted into useful fodder by a new method of soda treatment; and there was a great development in the collection of town waste, both for stock feeding and for manure.

No official estimate was published in 1941 of the actual outcome of all these measures, but it is obvious that they led to a substantial increase in the output of food, and this despite the fact that there was a large transference of man power from agriculture to the armed forces. The loss was partly made good by the employment of women.

Seasonal conditions, on balance, were favourable. The winter, for the second successive year, was severe, especially in the north of England and throughout Scotland; the consequence was a small crop of lambs from mountain pastures. Spring was cold and dry, and there was an acute shortage of grass, even in the lowlands, during the early part of May. Spring frosts were severe in some areas, with the consequence of a poor fruit crop. The weather during early summer was, however, favourable and all crops were heavy. Hay was secured under excellent conditions. During July and August heavy rains occurred in the south, and these caused some damage to early grain crops; but conditions in September were favourable for harvest. The quantity of grain secured was the largest that Great Britain has ever produced, and most of the other essential crops were fully up to average.

British Empire.—The problem of the dominions remained one of marketing. The greater part of continental Europe, which was in need of large quantities of foodstuffs, was cut off from the world markets. Russia, Spain and Portugal were the only remaining customers. Moreover the length of the haul from Australasia greatly restricted the transport to Europe of the bulkier commodities such as wheat, apples and canned fruit. Third, there was a shortage of refrigerated cargo space, which restricted the amount of perishable food—butter, cheese and eggs especially—that could be carried through the tropics. Finally, there was a natural reluctance on the part of Britain to accept luxury articles such as empire wines.

Some of these problems, however, were on the way to partial solution. Thus Canada's surplus grain was increasingly being converted into bacon. Additional plants for making dried-milk powder were erected in Australia and New Zealand. An increasing proportion of fruit was exported in dried form. Some promising experimental shipments were made of other substitute products—clarified butterfat (which does not need refrigeration) in place of butter; boned meat in place of whole carcasses (to allow fuller use of refrigerator space) and even minced and dried meat which, carried in ordinary hold space, has a food value per ton about five times as high as that of meat in carcass form. (J. A. S. W.)

For agricultural statistics of countries other than the U.S.A., *see* the subheading *Agriculture* in the articles on those countries, also the articles on various crops and agricultural products. (*See* also ALFALFA; CENSUS, 1940: *Occupations;* CHEMURGY; CORN; DROUGHT; FARMERS' CO-OPERATIVES; FARM INCOME; FARM MACHINERY; FARM MORTGAGES; FERTILIZERS; HAY; HORSES; IRRIGATION; LAW; OATS; PRICES; SOIL EROSION AND SOIL CONSERVATION; WHEAT; etc.)

Agriculture, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Aguirre Cerda, Pedro (1879–1941), Chilean statesman, was born Feb. 6 in Los Andes, Chile. Educated at St. Felipe college and the Pedagogic institute, he taught at the army subofficers' academy in 1900 and began the practice of law in 1904. He was elected deputy to the Chilean

parliament in 1915 and was named minister of education and justice in 1918 and interior minister in 1920.

Aguirre Cerda became the candidate of a popular front coalition for president and was elected in 1938 by a slim 4,000-vote margin. A champion of social reform, he announced plans for a Chilean new deal to aid the "forgotten man," but the tragic earthquake of Jan. 1939, which razed 20 cities and killed 8,000, compelled him to delay his social legislation in order to speed reconstruction.

He had served less than half his term as president when he died in Moneda palace in Santiago, after a short illness, Nov. 25.

Air Conditioning.

The air-conditioning sales volume for 1941 again exceeded the volume for the previous year by a substantial margin, thus indicating a healthy growth of the industry and an increasing public acceptance for the benefits of air conditioning to comfort and health. This increased sales volume resulted largely from improved products and greater national income.

The first half of 1941 showed an abnormally high sales increase. Because of material shortages resulting from the national defense program, this rate of increase was not maintained during the second half of 1941 in comfort air-conditioning equipment, although the sale of air conditioning for industrial and process work was maintained at a high rate.

The United States continued to be the principal centre of all air-conditioning activity, although various portions of Latin America were making progress along air-conditioning lines. Air-conditioning developments in the nations at war were more or less shrouded in mystery, although there was indication that various modifications of a complete air-conditioning process had been adopted for certain air-raid shelters and for the blackout type of manufacturing plant.

Air-conditioning Technique.—During 1941 there were no radical improvements in the technique of air conditioning. However, during 1941 various detailed improvements in product design were made, particularly in the small portable type of room cooler and in the small packaged type of central plant winter air-conditioning unit.

Increased attention was given to the benefits of the small forced-circulation type of window ventilator for use in office, hotel and apartment rooms, as well as homes.

More compact, lower cost and generally reliable window ventilators were available.

National Defense.—The air-conditioning industry was called upon to make substantial contributions to the all-important program of national defense. These contributions applied first to manufacturing plants where for process or for blackout reasons the plant would be quite impractical without the use of air conditioning. Also, in the rapid expansion of housing facilities for defense industry areas, it was shown that small, compact packaged types of central plant winter air conditioners might be applied at costs equal to or lower than the costs of ordinary and less satisfactory heating systems, and with definite benefits to the occupants of the home.

Further, considerable confidential research was under way, working toward the improving of the various defense operations for utilizing one or more of the principles of air conditioning. All of this was in addition to the manufacture of primary defense equipment in the "gun, tank and plane" class.

Future of Air Conditioning.—It was indicated that the industry would continue in 1942 to make important contributions to national defense on essential equipment. This meant that 1942 sales figures would show a reduction in air conditioning of the purely comfort type, but a substantial increase in air conditioning as applied to defense housing and to industrial and process work. It was indicated that forced changes in plans and designs, due to certain material shortages, would in the long run produce benefits in cost reduction and improved performance which would give the purchaser more for his dollar. (*See* also PUBLIC HEALTH ENGINEERING.) (EL. HA.)

Air Forces of the World.

U.S. Army.—The year 1941 saw accelerated the greatest peacetime expansion of the army air forces in United States history. During the fiscal year 1939 congress appropriated $73,556,972; appropriation for the fiscal year 1940 was $243,631,388; for the fiscal year 1941 appropriation was $3,892,769,570.

The fiscal year 1941 was a marked increase above the 1940 program, begun in 1939 and calling for 5,500 aeroplanes under the 25-group program, including 5 heavy bombardment groups, 6 medium bombardment groups, 2 light bombardment groups, 2 pursuit fighter groups, 7 pursuit interceptor groups and 3 composite groups, with 4,663 officers and 43,337 enlisted men.

Between this and the 54-group program there was a jump to 41 combat groups, with 10,846 officers and 89,672 enlisted men. The first aviation objective followed, including 56 combat groups and 6 transport groups, with 13,575 officers and 145,000 enlisted men. This program embraced 6,004 aeroplanes; 4,006 combat types in organizations, 1,998 in reserve.

Orders were placed for aircraft far above stated requirements, to expand facilities and anticipate British needs and air force expansion. During 1941 the air corps ordered and requisitioned approximately 28,500 aeroplanes.

Pilot training rate was expanded to 30,000 a year and rate of training enlisted technicians to 100,000 annually. Technical schools were increased by facilities at Biloxi, Miss.; Wichita Falls, Tex.; and Ft. Logan, Colo. The month of June 1941 found these other schools: primary (civilian) 29; basic (air corps) 7; advanced (air corps) 11; and special 13, including technical, gunnery, navigation and bombardier.

With air power universally recognized as a determining factor in modern warfare in which "so many owed so much to so few," the war department gave the air forces distinctive status. An assistant secretary of war for air was appointed. Also appointed was a deputy chief of staff for air, in addition, chief of the army air forces, controlling the air force combat command (formerly GHQ air force) and the air corps. A new air council included the assistant secretary of war for air (ex-officio), chief of the army air forces (president), chief of the air force combat command, chief of the war plans division of the war department general staff and chief of the air corps.

Providing close air support for army ground units, 5 air support commands were created, including observation aviation, light bombers, dive bombers, photography planes, gliders and air transport for parachute troops. The 1st, 2nd, 3rd and 4th air support commands operate with the respective field armies, and the 5th with the armoured force. (*See* also ARMIES OF THE WORLD.)

(H. H. A.)

U.S. Navy.—The Naval Aeronautical organization on July 19, 1940, was authorized by U.S. congress to increase its strength to 15,000 aeroplanes.

During the fiscal year 1941 the bureau of aeronautics directed its efforts toward the early completion of this program. A parallel training and base facilities program was established to support the increased procurement plan.

At the end of the fiscal year, June 30, 1941, there were 3,956 aeroplanes on hand, with 6,054 on order.

All combat ships of the navy, with the exception of destroyers and submarines, carry a complement of aeroplanes, ranging in number from two or three on the battleships, to approximately 75 on each aircraft carrier.

The type of aircraft carried is determined by the mission of the surface ship to which it is attached. From the requirements of these missions, four basic types of aeroplanes have evolved:

1. The fighting plane, whose primary mission is attacking enemy aircraft with gunfire.
2. Torpedo and bombing planes, including the dive bomber, designed to attack heavy enemy vessels or shore bases.
3. Scouting and observation planes, the eyes of the fleet, designed with emphasis on speed, range, gunnery defense and communication facilities.
4. The patrol plane, the largest type of plane in service, is self-protecting and carries out long-range scouting flights.

Surface ships supporting aircraft were modernized in the light of lessons learned during the early months of World War II, and additional ships were added for the support of naval aircraft, including 18 aircraft carriers on hand, under construction or authorized.

The carriers in commission in 1941 were: the "Yorktown," "Enterprise," "Ranger," "Wasp," "Hornet," "Lexington" and "Saratoga."

Future carriers, in order of their construction, would be: the "Essex," "Bon Homme Richard," "Intrepid," "Kearsarge," "Franklin," "Hancock," "Cabot," "Bunker Hill," "Oriskany," "Randolph" and "Ticonderoga."

To expedite the training program, maximum use was made of existing facilities, and on March 18, 1941, a directive was issued for the additional shore stations required. Shore facilities of the naval air arm, as of Oct. 1941, comprised 29 naval air stations in commission and four under construction. In addition, 16 U.S. naval reserve aviation bases were in commission, providing elimination flight training for prospective naval aviation cadets.

The training of navy aircraft personnel necessarily was coordinated with procurement and expansion of shore facilities. In June 1940 the only existing naval aviation training centre was at Pensacola, Fla. Pilot entry rate was 100 students per month. By July 1941 the navy had three additional training stations at Jacksonville, Fla., Corpus Christi, Tex., and Miami, Fla., with a combined entry rate of 800 students per month directed at the goal of 17,000 trained pilots for naval aviation. The training of enlisted personnel, mechanics, metal smiths, ordnance men and radio men reached a rate of 12,000 men every four months.

Concurrent with the expansion program, experimentation in glider usage was conducted and legislation authorized a lighter-than-air program of 48 nonrigid airships with shore facilities.

Plane performance and design progressed, with emphasis on manoeuvrability, speed, range and armament protection. Effort in every field was expended to increase the general efficiency of naval aviation. (J. H. Ts.)

The World.[1]—*Russia.*—Throughout 1940 the theatre of action for air warfare was largely restricted to western Europe. With Russia inactive and with the late 1939 campaigns to the east completed, the entire strength of the German luftwaffe was thrown against the British Isles. That effort failed to win the war for Hitler. During 1941, as new fronts were established in an effort to accomplish what direct attack could not do, the war in the air spread over the entire world. As the year ended, the R.A.F. was in action against Mussolini's air force and the luftwaffe in North Africa; Russian fighters were beating off German bombing attacks from the Arctic ocean to the Black sea; British and American air patrols were sweeping the north Atlantic, and American and Japanese squadrons were fighting for air supremacy from Honolulu to Hongkong.

Comparative Air Force Strength of Chief Warring Powers*

(Combat Units)

Allies	No. of Planes	Axis	No. of Planes
United States	3,000–5,000	Germany	5,500–8,500
Great Britain	4,500–5,500	Japan	5,000?
Russia	?	Italy	1,500–3,000
China	100–200	Hungary	400–600
Netherlands Indies	500–600	Finland	200–300
		Bulgaria	100–300
		Rumania	500–700

Taken from *New York Times* of Dec. 14, 1941.
*Corrected for known losses up until Dec. 12.

Twice during 1941 the shifting pattern of international alliances upset the balance of air power. In June German aggression made Russia an active axis foe rather than acquiescent partner. In December Japan made its bid for supremacy in the Pacific. Interest was therefore focused on two air forces that previously had played only minor parts in the war in the air.

Russian aviation had been an enigma for many years. Few American or British observers were permitted more than a glimpse of its fields and factories. It was known that large numbers of aircraft had been built during the middle 1930s. It was known also that thousands of pilots and parachutists had been trained. Soviet planes and pilots put up a fair showing in Spain, but were ultimately overwhelmed by the superior numbers and performance of German and Italian squadrons.

It was generally believed, however, that the quality of the matériel and personnel was below par, and serious doubts existed as to the ability of soviet industry to turn out replacements on a scale commensurate with modern war.

But from the meagre accounts coming out of the Russian campaign up to Jan. 1, 1942, Russia's fighting squadrons were giving a good account of themselves. Germany obviously underestimated Russian air strength when it made up the timetables for its advance on Moscow and Leningrad. As usual, claims of losses on both sides may well be discounted. Germany claimed that Russia had lost more than 50% of its initial fighting strength. How much it cost the luftwaffe in the process was unknown, but it was certain that the campaign cut deeply into Hitler's first-line planes and pilots.

Although large numbers of soviet aeroplanes were obsolete in 1941, some of the newer fighter and bomber designs stacked up with those of the rest of the world. The latest fighters were reported to be in the 350-m.p.h. to 400-m.p.h. class. The new I-26 was said to resemble the British Spitfire in appearance and in performance. Other fighters included the two-place monoplane I-21 with two 1,300-h.p. engines, armed with two 20-mm. cannons and six machine guns; the single-seater I-20 with one 1,300-h.p. engine, one 20-mm. cannon and six guns; and the I-18 single-seater with a 1,250-h.p. engine and the same armament as the I-20. In reserve as second-line fighters were the I-16 and I-17 single-seaters of about 800-h.p. which were used in Spain and later on the Manchoukuoan border.

A number of dive bombers and medium bombers were built under American licences. A modification of the old Boeing P-12 fighter with a Russian-built Cyclone engine was fitted for dive bombing and a considerable number of American-built Vultee attack planes were modified for that purpose.

In the medium bomber field the Martin and Boeing influence was evident. Few details of performance were known, but photographs showed that these types were thoroughly modernized. They should have been able to perform with corresponding types of the luftwaffe. For example, the CKB-26 medium bomber with two 1,000-h.p. M-63 engines was in service with many squadrons. It could do about 250 m.p.h. and had a range of approximately 2,500 mi. with 1,000 lb. of bombs. A newer and sleeker-looking machine, the DB-3A, had two liquid-cooled engines of better than 1,000 h.p. It was used both as a medium bomber and as a two-place fighter. Performance details were lacking.

In heavy bombers, the soviet air force appeared to be deficient. It had a number of very large and very slow six-engine machines of a type long since outmoded. Some of them were almost as large as the American B-19 bomber. Some were equipped to transport light tanks. For many years the Russians had been interested in aircraft for extremely long ranges, as witness the several flights across the north pole to the United States, but few authoritative reports were forthcoming of concentrated raids by heavy Russian bombers against German industry.

Because of the necessity of defending thousands of miles of coast line, Russia had a large but unknown number of naval aircraft, mostly of small patrol types. Since 1930 a great deal of experience had been gained with these machines, as well as with land types, in arctic operations. There was no doubt that the soviet air forces had more experience in winter flying than any air force in the world—a factor that might carry considerable weight in the campaign against the Germans during the winter of 1941–42. It was well known that Russia had thousands of trained

[1]All assertions or opinions contained in this section of this article are the private ones of the writer and are not to be construed as official or reflecting the views of any government service.

paratroops and large numbers of troop transports, although no extensive use of this tactic had been reported. The soviets also pioneered in the transportation of troops by glider. But again, no actual demonstration of strength in this field had been made by the close of 1941.

Japan.—The sudden eruption of Japanese aggression in the Pacific focused attention on another air force about which comparatively little was known. In spite of the fact that Japan scored initial successes in surprise air attacks against Hawaii and the Philippines, there was no question but that its air forces, both naval and military, were second-rate. Some of its medium-class bombers were of reasonably modern design. The Nakajima 19s used by the army appeared to be in a class with American B-18s. The Mitsubishi Soyokaze twin-engine naval bombers showed a decided German Junkers (JU-86K) influence. Neither of these machines, however, was very fast—possibly 250 mi. an hour. Among the best of the bombers (a machine that probably was used against Manila from bases in Formosa and in China) the Mitsubishi 92 bore close resemblance to the Martin 166—long since considered obsolete by the U.S. army air forces. This machine had two 1,000-h.p. radial engines, and probably cruised at around 250 m.p.h.

Japanese light bombers, of which the Mitsubishi 97 was typical, were single-engine two-place monoplanes resembling closely the outmoded U.S. Northrop A-17 attack ship.

Whether or not the Japanese air forces had any large four-engine bombers was problematical. The Japanese government purchased the Douglas DC-4 commercial prototype and the manufacturing rights. A bomber version of this large machine might have been built, but no actual evidence came to hand. It was known, however, that the Japanese navy had a number of large four-engine flying boat patrol bombers, somewhat similar to earlier U.S. Sikorsky S-42 clippers. Ships of this type might have taken part in the bombing of Hawaii, although direct evidence was lacking.

As far as was known, Japan had no fighters that compared with modern British, German or American machines. Nothing like the Spitfires or Hurricanes or U.S. P-39s or P-40s appeared. The fighters operating from carrier decks were similar in appearance and probably in performance to machines that were designed about 1936. It would seem probable that shore-based fighter squadrons in Japan were equipped with more modern machines, but up to the end of 1941 no direct contact had been made with them. In view of alliances with Germany and Italy, it would be a fair assumption that new German designs or actual German and Italian aircraft had been supplied to the Japanese forces in Japan. It was well known that German officers were instructing Japanese squadrons in the latest fighting tactics.

In the first few days after the attack on Pearl Harbor it was popularly supposed that German pilots manned many of the Japanese aircraft. That assumption soon proved untenable. Although there was little doubt that the major strategy was mapped out on the Wilhelmstrasse, the actual execution was carried out by Japanese naval pilots in Japanese naval planes. Strategists had been prone to underrate Japanese aviation because of the comparatively poor showing that had been made in China. Possibly the contrast between performances in China and against U.S. possessions in the Pacific might be accounted for partly by the fact that Chinese operations were in the hands of the Japanese army, and the latter were conducted wholly by the navy. Technical training of Japanese personnel ranked with that of most navies of the world. It might be argued that their naval aviation was better than that of their army—only the future could prove or disprove the point.

Italy.—Italy's disastrous campaign in Greece and in north Africa in the latter half of 1940 cost Mussolini a high percentage of his air force. As a result, Italian air activity during 1941 was not outstanding. Army pilots were continuously engaged against the R.A.F. in Africa, and in late September, a mass torpedoplane attack against a large convoy in the Mediterranean was claimed by Rome to have been highly successful, but was discounted in London.

During 1941, however, Italian designers and builders were not idle. The country had some first-rate men and some first-rate plants. Indications were that a number of new fighters, bombers and torpedo carriers, of a calibre to be reckoned with, would appear on Italo-axis fronts in 1942.

The new fighters were largely in the "hush-hush" class. Photographs of only one or two came to the U.S.A. but they had all the earmarks of modernity with a strong Germanic flavour. The Reggione Re2001, for example, was a single-engine single-seater monoplane of excellent appearance. It exhibited the Italian trend away from radial air-cooled engines to the liquid-cooled in-line power plant for fighters. The ducted radiator treatment matched the best British or American practice. Certain new designs with extension shaft drives similar to those of the U.S. Bell Airacobra were rumoured. The general trend seemed to be toward relatively light single-seaters with great fire power.

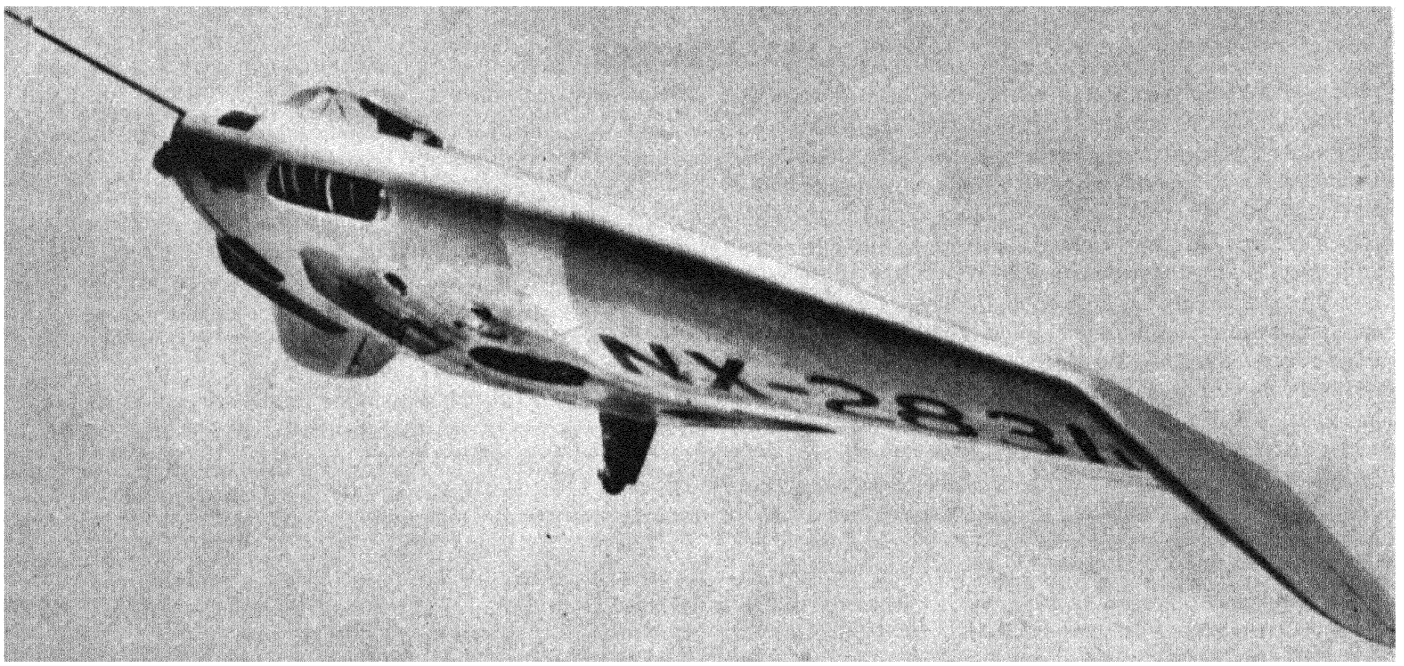
In the bomber field, a number of new machines came out into the open. A few, like the Fiat B.S.A., were two-engined. Some, of which the Savoia-Machetti 84 and Piaggio 23R were typical, clung to the three-engine arrangement which had almost disappeared elsewhere. Four-engine "heavies" which resembled U.S. Boeing Flying Fortresses were in production. The Piaggio P-50 and P-108 were in this class. They were fitted with engines in the 1,200- to 1,350-h.p. range. A secret twin-engine dive bomber, probably similar to the Breda 88, was said to be under test.

The Italian navy was taught a costly lesson by the British at Taranto. After that disaster it redoubled its efforts in the development of torpedo-carrying seaplanes. Several new types were in the offing—fast ships capable of carrying one or two torpedoes for long distances. The Fiat RS-14 was a twin-engine torpedo bomber. The Savoia-Machetti SM-94 had three engines.

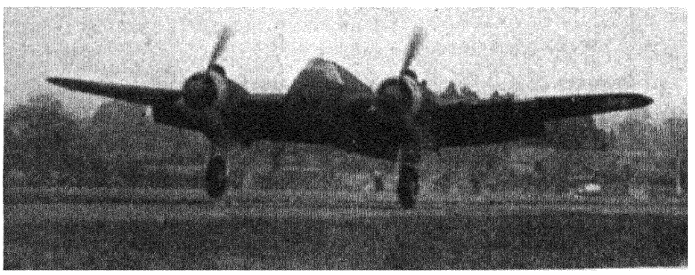
With Russia's air forces barely holding their own on the eastern front, and with the weight of fresh Italian and Japanese squadrons on the axis side of the balance, increased production of better planes for the Allies was of paramount importance. The war might be won or lost in the aircraft factories as much as in the air.

Great Britain.—In the early weeks of 1941, after a long series of destructive raids against British industry, there was some reasonable doubt as to Britain's ability to maintain aircraft production rates in competition with the German factories. Two things turned the tide. One, the relief of pressure from air attack due to the opening of the Russian front in June, and two, the increasing weight of American industry behind Britain's air effort. In the early months of 1941 that effect was possibly more psychological than real, but as the year grew older, increasing numbers of American-built planes appeared on R.A.F. aerodromes from the Scottish moors to the sands of North Africa. Day and night, winter and summer of 1941, an ever-growing stream of bombers winged across the north Atlantic, and every convoy from American shores for British possessions carried, in its holds and on its decks, replacements for R.A.F. squadrons.

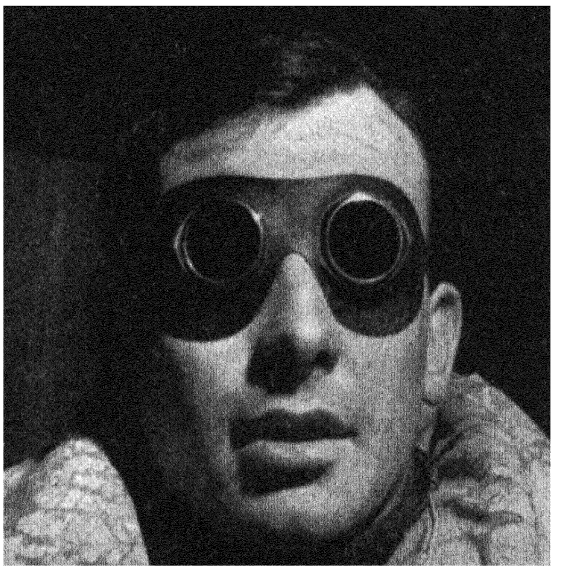
The list of U.S.-built aircraft serving with the R.A.F. in 1941 is impressive. In addition to hundreds of trainers of all types furnished to Canada and to Britain, the following were on R.A.F. rosters: Fighters—Bell Airacobra, Brewster Buffalo, Curtiss Kittyhawk, Curtiss Tomahawk, Curtiss Mohawk, Douglas Havoc, Grumman Martlet, Lockheed Lightning and North American Mustang. Bombers—Boeing Flying Fortress (four-engine), Brewster Bermuda, Consolidated Catalina (flying boat), Consolidated Lib-



MILITARY "FLYING WING" demonstrated at Hawthorne, Calif., in Oct. 1941. It has no fuselage or tail surface



THE BRISTOL BEAUFIGHTER, equipped with a radio locator in its nose, became a potent British weapon against German night raiders in 1941



DARK GOGGLES worn by night-fighting pilots of the R.A.F. to accustom them to seeing in the dark

THE DOUGLAS B-19, largest bomber in the world, as it was rolled out of the factory at Santa Monica, Calif., to undergo its first test flight, June 27, 1941. Close by is a standard-sized civilian transport plane

LOCKHEED HUDSON BOMBERS lined up at Floyd Bennett field, Brooklyn, before shipment to Britain in the spring of 1941

erator (four-engine), Curtiss Cleveland, Douglas Digby, Douglas Boston, Douglas Nomad, Lockheed Hudson, Martin Maryland, Martin Baltimore, Vega Ventura and Vought Chesapeake. Practically all of these machines were counterparts of production types for the U.S. army and navy. They were of the latest U.S. production designs and were fitted out with the best equipment U.S. factories knew how to build. The timing of the Japanese attack against the United States in early December was undoubtedly set by Germany in an effort to stem the flow of aeroplanes and other supplies to Britain after the failure of the submarine and aerial blockade to pinch them off in the Atlantic. Before the outbreak of the war in the Pacific, statistically minded aviation observers estimated that the combined production rates of the United States and Great Britain in aeroplanes and engines would be in a fair way to match the probable output of axis factories by the spring of 1942.

This did not mean necessarily that the total air strength of the Anglo-American air forces would then be at parity with the axis powers. It must be remembered that Germany and Italy (and even Japan) had secured a lead of several years, both in planes and pilots. It seemed likely, however, that with the acceleration in U.S. industry, and assuming that the German situation did not change materially, the fall of 1942, or at latest, the spring of 1943, should see air superiority shifted to the side of the Allies.

Whether this shift would occur sooner or later depended to a great extent upon the situation in Russia. In spite of the fact that Russia was an ally for more than six months, very little was known of its potential contributions to the production picture. Whether or not the factories were in a position to replace soviet losses without drawing too heavily upon the already overtaxed production facilities of Britain and America remained to be seen. It was, perhaps, too much on the optimistic side to expect that any surplusage of machines or motors would be available for Allied use. The most that could be hoped was that Russian industry could replace its own losses.

Losses.—Statements of losses to enemy ships or aircraft during wartime are always subject to considerable question. In mass air fighting it is extremely difficult to keep track of enemy planes shot down. There is always a tendency to overestimate on one side and to understate on the other. Experience has indicated, however, that such statements by the British are reasonably reliable. With these reservations in mind then, the following are the figures given out by the British air ministry covering losses in combat and by anti-aircraft fire from the beginning of the war in Sept. 1939 to Nov. 9, 1941 (not including the losses in the Russian campaign):

Aeroplanes lost by the axis air forces	7,458
Aeroplanes lost by the imperial air forces	3,596
Personnel losses by the axis air forces	20,565
Personnel losses by the imperial air forces	10,295

Performance.—Next to high output, improved performance for all types of aircraft was the continuous objective of designers on both sides. But they were in 1941 approaching performance ceilings that were going to be extremely difficult to break through. Fighter speeds, for example, had been pushed slowly upward by the application of power and more power, but seemed by the end of 1941 to be levelling off at somewhere over 400 mi. an hour. Until some radical departure in design was to put in an appearance, speeds much above that figure would probably cost too much in engine power to be practical for military aircraft. In spite of the fact that the output of the best aeroplane engines advanced after 1939 from 1,200 to close to 2,000 h.p., the advance in speeds was not anything like commensurate. Most of the power went for carrying more and bigger guns, more ammunition and better armour.

The big drive was to fly at higher levels. Where air strategists in 1940 mapped out campaigns at 25,000 ft., the talk in 1941 was of 35,000 to 40,000 ft. Here again physical limitations impose tremendous difficulties. With air pressures at 40,000 ft. only one-quarter of sea-level values, the problem of supercharging men and motors is complicated and difficult. In addition, the effects of low pressures and low temperatures on the operation of ignition systems, radio sets, machine guns and other auxiliaries bring up new problems that have heretofore been dormant.

In this connection, the behaviour of American-built Flying Fortresses in the hands of the British was a surprise, both to the R.A.F. and to the Germans. Thanks to the turbo-superchargers with which these four-engine Boeing bombers were equipped, the British were able to conduct a number of effective daylight raids against German industrial centres at levels generally out of reach of anti-aircraft fire or of most interceptor fighters.

High altitude bombing caused a noticeable shift in thinking with respect to interceptors. Heretofore, with bombers unable to get up over 20,000 or 25,000 ft., it was relatively easy to build heavily armed and heavily armoured interceptors that could easily outmanoeuvre them. Such machines, however, are at a decided disadvantage at 35,000-ft. levels. The latest single-engine Messerschmitt 109F was lightened by the removal of all armour plate and by reducing the armament to one cannon and two machine guns. A lightly armed aeroplane that will manoeuvre well at 35,000 ft. is superior to a more heavily armed machine that is barely able to fly at such altitudes. The same trend was noted with respect to Italy's fighters.

Bombers.—Bomber design in Britain shifted definitely toward big types with loads and ranges far in excess of the Wellingtons, Whitleys and Hampdens with which the R.A.F. started the war. During 1941 the four-motored Short Stirlings and Handley-Page Halifax machines appeared in quantity in the squadrons of the bomber commands. Later, the Avro Manchesters, with a pair of 24-cylinder Rolls-Royce Vulture engines reported for active duty. These were supplemented by increasing numbers of U.S.-built Boeing Flying Fortresses and Consolidated Liberators delivered via the north Atlantic route. It was with such machines that the R.A.F., come the spring of 1942, expected to overcome the handicap of distance which separates British aerodromes from German industrial centres. All signs pointed to intensive preparation for assuming the offensive and for carrying the war in the air deep into German territory.

Fighters.—Nothing radically new appeared during 1941 in the fighter class in any of the belligerent countries. Spitfires and Hurricanes in improved models continued to implement R.A.F. fighter squadrons. Only one of the twin-engine British interceptors that were forecast in the fall of 1940 as antidotes for the ME-110s put in an appearance—the Bristol Beaufighter. This machine had enough range to convoy bombers to Berlin and return. The best night fighter of the R.A.F. proved to be the U.S. Douglas Havoc. This machine was a modification of United States A-20 light bomber, with a noseful of guns substituted for the original bombing equipment.

The Spitfires and Hurricanes of late 1941 were far more powerful weapons than their 1940 predecessors. Fire power was increased to the limit of practical wing loadings. Hurricanes appeared late in 1941 that carried as many as four 20-mm. cannons mounted in their wings. In fact, few fighters were being considered for production carrying fewer than 10 or 12 wing-mounted 30 to 50 calibre guns, or the equivalent in cannons. This heavy armament was supplemented in some cases by the addition of two 250-lb. bombs slung beneath wings. Squadrons of Hurricanes with 12 machine guns and 2 bombs were used against the German-held channel ports in mid-December. These machines, although too heavily loaded to be effective as fighters during the cross-channel flight, regained their normal fighting characteristics once they unloaded their bombs on targets on the French coast.

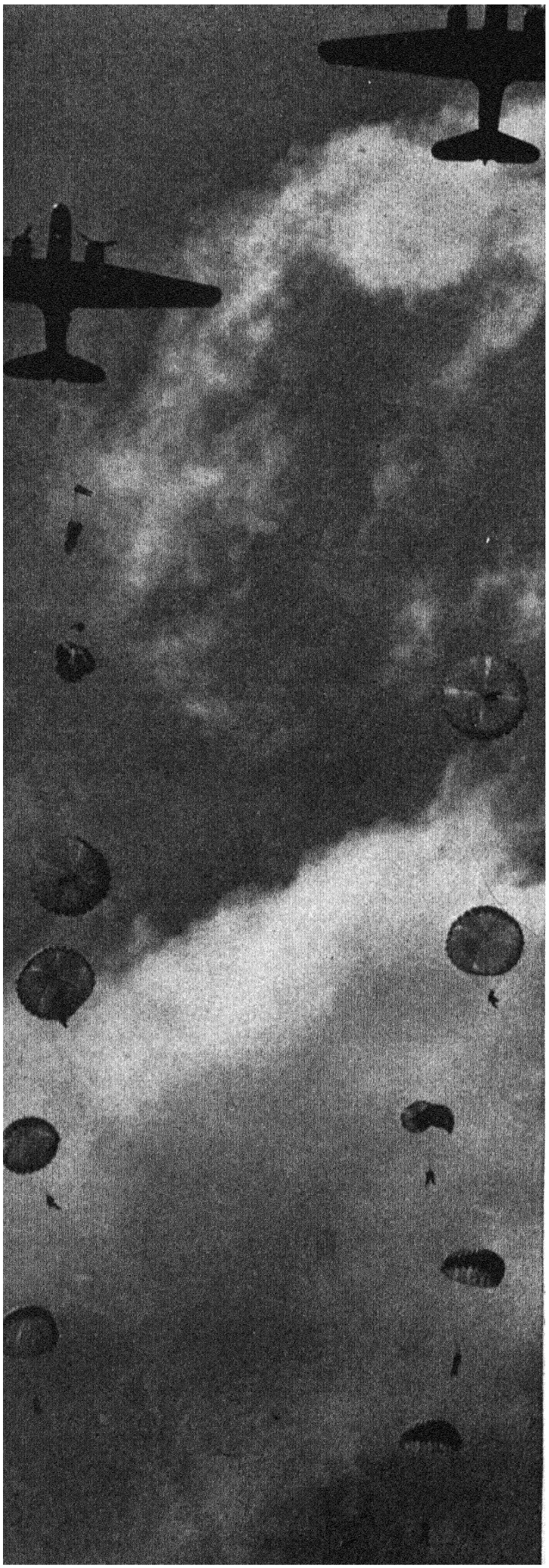
Germany carried on with improved models of the Messerschmitt 110 two-engine fighter that first appeared in quantities in 1940, and with the lightened version of the original single-seater (Me-109F) mentioned above. New and more radical types were rumoured in the making, but had not appeared on any front at year's end.

Commerce Raiders.—Germany continued the use of big bombers as commerce raiders far out at sea. The Focke-Wulf Kurier with four 1,000-h.p. engines was supplemented for such work by the four-engine Bloehm and Voss seaplane bombers and the newer twin-engine Heinkel 110 torpedo carrier. It was claimed that 3,000,000 tons out of the 13,500,000 tons of British shipping that had been sent to the bottom since the beginning of the war were accounted for by the *luftwaffe*. Some of these sinkings took place as much as 1,000 mi. off shore. As an antidote, British and American aircraft were convoying across the Atlantic route from Canada to Britain. Both shore-based patrol aircraft (operating from Greenland and Iceland) and shipboard fighters were being employed. It was rumoured that certain British merchantmen were fitted with catapults from which single-seat fighters might be launched when attacks were made by the German bombers.

"Ersatz" Aircraft.—There was a popular notion that German aircraft were inferior to British and American machines because of Germany's extensive use of "ersatz" materials. That this was merely a form of wishful thinking was proved over and over again by detailed examination of captured German aircraft and engines. Some of the materials employed were not those that could be conventionally specified, but in most instances the substitute material was found to be the equal, if not better, than the non-German articles. Flying equipment captured on all fronts down through the end of 1941 was of excellent design and construction. All accessories, equipment, instrumentation, radio, etc., were up to standards that were acceptable elsewhere. Tests on captured engines indicated performance, reliability and length of life on a par with other engines of the same class. Fuel and oil from the tanks of German aeroplanes were analyzed and found to be perfectly adequate for the job at hand. There was no indication that quality of German aircraft suffered for lack of any essential materials.

As a matter of fact, there were indications that German research had uncovered new fuels and materials that might be better than those considered standard. For example, reports from British fighter pilots, as well as the evidence on captured German fighters, indicated that special emergency fuel in small quantities was carried that might be used to give a temporary burst of power to enable the fighter either to overtake or to run away from an opponent. Also, there was some reason to believe that assisted takeoffs for heavy bombers by some form of rocket motor was used on an experimental scale. It was known, of course, that some experimental work along these lines was conducted in Germany several years before the war. In this connection, several reports came out of Germany, Britain and Italy, of new types of aircraft to operate at high speeds at high altitudes on rocket or jet propulsion methods. Few details were available in 1941.

Icing.—All belligerents flying in Europe during the winter months had difficulty with icing of aircraft and engines. Ice is frequently encountered on the north Atlantic ferry routes. Several planes were lost on transatlantic delivery flights, and on one occasion, 37 British bombers were lost over the North sea in the course of a long-range raid into Germany, probably because of icing. A great deal of effort was being made on both sides to eliminate this hazard. The Germans were probably having less trouble from icing of engines because of the widespread use of direct fuel injection in place of the more common carburetion. They also made considerable progress in the direction of controlling icing on wings and tail surfaces by the application of heat from the engine exhausts—a technique that was under intensive study in the U.S.



Anti-aircraft Protection.—Although no startling new methods or devices for anti-aircraft protection in the way of guns, balloon barrages, searchlights, etc., came into use during 1941, great strides were made in methods of detecting the approach of hostile aircraft. The older aural listening devices gave way to radio detection methods that were very accurate and which covered far greater distances. By the use of these detectors, supplemented by reports from ground observers, the British developed an elaborate and successful control system which permitted the plotting of the courses of aircraft approaching the British Isles, and from which orders were issued to aerodromes all over Britain for the sending up of interceptors and fighters. This system, together with the improved arming and performance of Britain's night fighters, was an important factor in reducing the severity of German night raiding over Great Britain.

Tactical Innovations.—If technical surprises were few, some tactical innovations were startling and of considerable significance. The use of paratroops was already well established before the end of 1940. Key points in Norway, Holland and Belgium were taken by the sky troops. There had been persistent rumours, however, of possible invasion of Great Britain by transporting large numbers of troops in glider trains. None such appeared over the English channel, but the taking of Crete might well have been a dress rehearsal for an attempt in that direction. Not only were paratroops used in large numbers, but for the first time troop-carrying gliders were towed over an objective and landed successfully on enemy terrain. The machines used carried eight to ten fully armed men and had a wing span of some 80-odd feet. They were of steel and plywood construction and were stout enough to be landed safely on rough ground. Trains of three to five of them were towed behind JU-52 transports. How many hundreds of troops were put down on Crete in this manner was not definitely known, but the manoeuvre was successful enough to cause every air force in the world, including that of the United States, to make a hasty reassessment of the value of motorless aircraft as a military weapon.

Air Power v. Sea Power.—However, a series of events of world-shaking importance with respect to aviation took place in the closing months of 1941. For the first time in the history of aviation, the proponents of air power *versus* sea power could point to definite examples to prove their arguments, rather than having to rely entirely on theoretical considerations. The number of capital ships sunk by aerial bombardment, both in the open sea and while lying in harbours, was not fully known. The British success against the Italian navy at Taranto was only a beginning. The toll was rising steadily. Although the German battleship "Bismarck" was sunk by naval action, it was hunted down and brought to bay by aircraft. Out of a clear sky, Japanese airmen dropped into Pearl Harbor and inflicted losses on the U.S. Pacific fleet that were not, up to Jan. 1, 1942, fully evaluated in public. Some three days later, the English-speaking world was plunged into gloom by the destruction of the British warships "Repulse" and "Prince of Wales" when they were caught off Singapore without air protection. Naval people everywhere who had counted on the invulnerability of modern battleships had to face the uncomfortable fact that no surface vessel could fight off, without adequate aerial protection, a determined assault by large numbers of bombers and torpedo carriers determined to destroy it at any cost.

Gen. William Mitchell, who resigned from the U.S. army air corps in the middle '20s as a result of his unorthodox opinions, may not have been entirely right in claiming absolute superiority for air power over naval power. There is little doubt, however, that the lessons of 1941 were having a profound effect on naval thinking and naval tactics all over the world. [*See* also AVIATION, CIVIL; DEFENSE, NATIONAL (U.S.): *Armed Forces;* MUNITIONS OF WAR; WORLD WAR II.] (S. P. J.)

Air Mail: *see* POST OFFICE: *United States.*

Airports and Flying Fields.

Transportation and civilization have always advanced hand in hand, and United States engineering genius has always played a large part in improving transport facilities. In 1941, however, that genius was directed toward war, another world war, with the aeroplane its chief weapon. Airports in the U.S., far from being solely a factor in the nation's commercial development, became a vital factor in its national defense. Each civil airport, whether small or large, must be considered a potential military airport in time of war. Thus, every consideration must be given to its utility and adaptability to war. Scientific aids to flight which had been developed were being improved under emergency pressure.

In order to provide the nation with enough adequate airports from which planes may defend it in case of attack, $40,000,000 was appropriated for airports in the 1941 budget, and for 1942 an additional appropriation of $94,977,750 was made by congress to the Civil Aeronautics administration. This airport construction program, while closely co-ordinated with defense efforts, was of double value as an investment for it not only met an im-

PARACHUTE TROOPS of Camp Benning, Ga. dropping at regular intervals from U.S. army transport planes. By the fall of 1941 the number of such troops had grown from 48 to more than 4,000

mediate and urgent defense need, but also represented a permanent contribution to aviation in general.

Construction or improvement projects were to be conducted on 288 airports in the United States during 1941-42. These locations involved a total estimated expenditure of $80,810,110, of which $53,409,800 would be spent on 26 locations in the initial program but not in 1941 placed under construction, and 149 new locations in the continental United States. New locations mean those not heretofore included in the Civil Aeronautics administration program. A total of $18,968,871 was to go toward continuing work on 113 other projects in the United States started in the initial program authorized in Oct. 1940. It was anticipated that all work would be completed during the early part of 1942. In the over-all Civil Aeronautics administration airport program which began Oct. 1940, completion of this program would mean that the national total of airports would be increased by 43 class 4, 246 class 3, 14 class 2, and 2 seaplane ramps as a result of the Civil Aeronautics administration program. Class ratings are by runway lengths, class 1 having runways of 2,500 ft. or less; class 2, 2,500 ft. to 3,500 ft.; class 3, 3,500 ft. to 4,500 ft.; and class 4, 4,500 ft. or more.

Airport construction and improvement projects under the supervision of the Civil Aeronautics administration were limited to airports owned by local governmental authorities. The work undertaken on these airports was restricted to the development of landing facilities. All other improvements, including hangars and other buildings, must be done by local enterprises or local government. The airports must be operated in the general public interest, must remain in public ownership, and local government must agree to maintain and operate them.

Federal Airways System of the United States.—Under the stimulus of national defense, the Civil Aeronautics administration continued its rapid expansion of the federal airways system during the fiscal year 1941.

As of July 1, 1941, the total mileage of lighted operating airways in the United States had risen to 30,913 mi. There were 1,945 mi. of airways under construction and 921 mi. under survey. Other indications of the progress made in this direction are the following figures for air navigation facilities in operation as of July 1, 1941: 2,276 airway beacons, 280 intermediate landing fields, 29 lighted airports maintained by the Civil Aeronautics administration, 114 full-power radio stations, 139 medium-power radio range and communication stations, 39 low-power radio range and communication stations, 38 nondirectional radio marker stations, 118 ultra-high frequency fan markers and 2 modified Z-type markers.

Air Navigation Facilities of the U.S., Dec. 1, 1941

Source: *Civil Aeronautics Journal*

AIRPORTS	
Airports with servicing[1]	1,018
Airports with paved runways	298
Airports with two-way radio	398
Lighted airports[2]	691
Airports by class:	
Municipal	1,082
Commercial	901
Private	31
Army	78
Navy	38
Misc. govt.	40
CAA intermediate fields	283
Total	2,453
SEAPLANE BASES	
Army, navy, coast guard, marine corps	36
Other seaplane bases and anchorages	328
Total	364
Seaplane bases having any night lighting equipment	22

RADIO AIDS	
Ranges (11 in Alaska, 2 in Hawaii)	307
Range stations, simultaneous with voice (10 in Alaska, 2 in Hawaii)	196
Range stations, nonsimultaneous with voice	99
Range stations, no voice (1 in Alaska)	12
Broadcast stations (11 in Alaska, 2 in Hawaii)	120
Broadcast stations, simultaneous (10 in Alaska, 2 in Hawaii)	117
Broadcast stations, nonsimultaneous (1 in Alaska)	3
Marker stations	35
Fan markers	149
Voice (only) stations (5 in Alaska)	18
Z markers (not at range stations)	2

[1]Servicing: hangar, repairs and fuel available.
[2]Lighted airport: boundary and beacon and/or floodlights.

CONTROL TOWER of the National airport at Washington, D.C., most modern in the world at the time of the airport's opening June 16, 1941. It has radio receivers for each airline using the field

Over a network of 13,292 mi. of teletype wires were transmitted instructions and information needed for the orderly direction of airways traffic from 133 traffic control stations. Invaluable weather information was supplied from 414 weather reporting stations, with a teletype mileage of 29,422 mi.

Traffic along this vast chain also must be guided 24 hr. a day, a job that requires the unceasing vigilance of more than 3,000 employees and costs more than $1,500,000 a month to maintain.

The major development in 1941 was the establishment of ultra-high frequency radio ranges and radio landing systems at various points throughout the country. Congress appropriated $2,477,000 to the Civil Aeronautics administration for this purpose. The New York-Chicago airway was the first link in what the Civil Aeronautics administration technicians believe would be the eventual conversion of the entire 35,000 mi. of federal airways from intermediate frequencies in the 200-400 kilocycle band to ultra-high frequencies between 119,000 and 126,000 kilocycles. The utilization of ultra-high frequency radio waves not only eliminates interruptions due to static interference inherent in the low frequencies, but assures uniformity of signal strength in the pilot's headphones. (E. M. E.)

Air Races. The spreading war conditions and governmental acquisition of most aeroplane production lines, reduced civilian air races throughout the world to a new low. Naturally European countries had no air races scheduled at all and even in the United States, not at war until almost the end of 1941, numerous air race events were cancelled. Chief among the annual races thus postponed for the duration, was the 1941 National Air races which for a score of years before had been a world-famous classic. The Bernarr Macfadden Trophy race also had to be called off. However, this was the one event whose cancellation was not due to the unsettled world conditions, but rather to unsettled weather.

Other air race attractions which were temporarily shelved included the Firestone Trophy race for aerial flivvers; the Colonel Batista Cup race for aerobatics; and the Culver Trophy races in California.

One event for women, a 25-mile race at Miami, Fla., was won by Virginia Snodgrass of Waterloo, Ia. She stepped up her machine to 104.035 miles per hour. (T. J. D.)

Air Raid Shelters. Public and domestic air raid shelters are provided in Great Britain by local authorities under the statutory powers conferred upon them by the Air Raid Precautions act 1937 and by the Civil Defence act 1939. The latter act also places certain duties on the owners or occupiers of factories, commercial buildings and mines employing more than 50 persons to provide shelter of a standard not less than that of the code referred to in section 13 of the act.

These acts are administered by the minister of home security. The responsibility for the execution of the work rests upon the local authority in respect of public and domestic shelters, and upon the owners or occupiers of factories, commercial buildings and mines.

Domestic shelter was originally provided free by the local authority on a grant-aided basis for all persons whose income was less than £250 per annum. Persons with higher incomes were expected to provide shelter for themselves. Domestic shelter was in 1941 provided as far as possible for persons whose income was less than £350 per annum, and the cost was reimbursed in full to the local authority.

The conception before the war was that the populace should be dispersed to the maximum possible extent, taking refuge in their own homes and at their work. Public shelter was intended only for those caught by a raid out of reach of home and place of work.

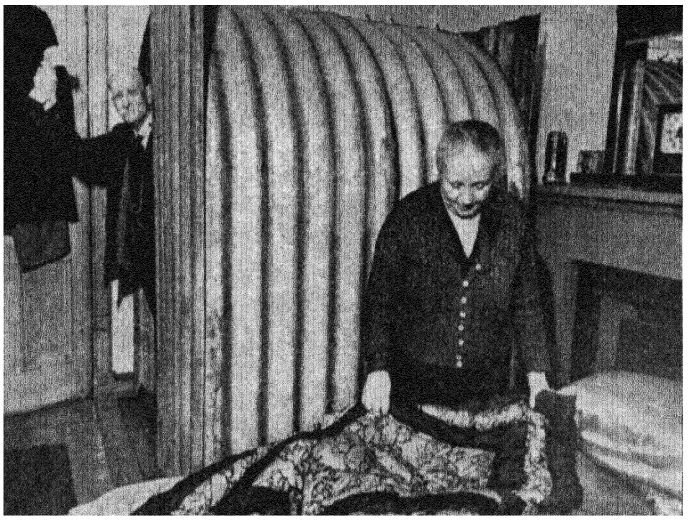
Experience of raids had shown beyond question the value of dispersal and while daylight raids were frequent the original system of shelter was satisfactory. The defeat of the day raids and the adoption of night bombing, however, led to a demand for dormitory shelter in the more vulnerable towns. Both public and domestic shelter which was only designed for short periods of occupation, therefore, had to be remodelled to provide dormitory accommodation by the provision of suitable bunks, lighting, heating, etc. Experience and research led to modifications in the design of shelters.

It was decided that deep or bombproof shelters should not be provided, the chief reasons being the impossibility of providing such shelter for all and the obvious undesirability of everyone going to ground during raiding. In the absence of adequate data it was decided that shelter should provide protection against blast, splinters and debris and the standard requirements were set out in the code referred to above. The shelters so constructed in the main stood up to bombs at closer range than their design provided for, but experience indicated that the earth waves set up by a bomb exploding after penetrating the ground led to more failures of shelters than any other cause, and shelters were redesigned to meet these effects and existing shelters modified accordingly.

The first domestic shelter to be designed, manufactured and issued by the government was the "Anderson" shelter. This consisted of corrugated iron sheeting upon a light angle-iron frame sunk three or four feet into the ground and covered with earth as a protection against splinters.

This shelter proved its value abundantly and, moreover, owing to its ductile properties, withstood the effect of the earth waves from bombs so close that the shelter was on the very edge of the crater and sometimes even closer.

For both domestic and public shelter, basements were also largely used. This form of shelter was popular as there was a tendency among many people to go to ground in air raids. The roofs of such basements were shored to prevent their collapse under the debris of the building above. Here again the design of the shoring was modified to meet the effects of earth shock.



ANDERSON AIR-RAID SHELTER installed in the bedroom of a private home in Glasgow, Scotland

A large proportion of the domestic and public shelter provided was brick and concrete structures, the designs of which were revised from time to time in the light of actual bombing and experiment.

Experience also showed that the protection against splinters and blast afforded by the average dwelling house is greater than was expected and that the chief danger therein is from debris due to collapse. This and the desire to provide shelter in the home in pursuance of the policy of dispersal led to the adoption of an indoor shelter designed to protect the shelterers against debris. The "Morrison" shelter, which consists of a strong steel framework supporting a steel table top and having a spring mattress, was issued in large quantities and proved its value in saving life, many persons having been rescued uninjured from houses which have collapsed on the shelter.

Public shelter was also provided in trenches, railway arches and disused tunnels. Trenches were the first type to be provided, the best being those lined with *in-situ* reinforced concrete. While trenches have of course been immune from splinters, blast and debris, except from a direct hit, they have been liable to damage from earth shock and steps were taken to strengthen them.

Experience indicated the value of modern fully framed buildings of reinforced concrete or steel, particularly the latter. Their resistance to collapse under even direct hits makes them eminently suitable for shelter. Wherever possible such buildings were used for shelter purposes.

Mention has been made of the use of existing tunnels as shelters. Many of these and old quarry workings, such as the Chislehurst caves, were adopted as shelters by the public without authority. Some of those so adopted were, unlike the Chislehurst caves, by no means bombproof and the calamity risk in the event of penetration was, of course, serious. Wherever suitable tunnels existed opportunity was taken to render them safe.

In London the stations of the tube railways were thrown open to the public for shelter when night raiding was heavy. Bunks and other amenities were provided.

Additional tube shelters were also being prepared against future emergencies by constructing portions of tube railways on the lines of future railway extension, some of which were ready for occupation in 1941. The provision of shelter was throughout hampered by the shortage of suitable material or of labour, but at the end of 1941 there was shelter accommodation for about 21,-

000,000 people in public and domestic shelter in addition to shelter provided by householders at their own expense and the shelter provided in factories, commercial buildings and mines. For organization against air raids in the U.S.A., *see* CIVILIAN DEFENSE, OFFICE OF. (A. M. R.)

A.L.A.: *see* AMERICAN LIBRARY ASSOCIATION.

Alabama. Alabama is one of the "deep south" states of the United States, admitted to the union 1819. Area, 51,609 sq.mi.; pop. (1940) 2,832,961. Capital, Montgomery (78,084). Cities with larger population were Birmingham (267,583) and Mobile (78,720). Of the state's population in 1940, 855,941 were urban, or 30.2%. There were, in 1940, 1,847,850 whites; 983,290 Negroes; 574 of other races; 2,821,004 native-born; 11,957 foreign-born; 47.2% of the total population was rural.

History.—Chief officers of the state in 1941, elected for service beginning Jan. 16, 1939 were: governor, Frank M. Dixon; lieutenant governor, A. A. Carmichael; state auditor, Howell Turner; secretary of state, John Brandon; state treasurer, C. E. McCall; attorney general, T. S. Lawson; superintendent of education, A. H. Collins; commissioner of agriculture and industries, J. H. Paterson.

Education.—A well defined system of elementary and high schools and colleges for both races is maintained. Elementary education is free between the ages of 6 and 21, and compulsory between the ages of 8 and 16. State appropriations in 1941 amounted to $14,795,041. Total revenues from all sources were $24,910,789. Illiteracy among whites between 10 and 20 years was 1.9%, Negroes 2.6%. There are seven state-supported institutions of higher education for whites and three for Negroes. Several colleges are maintained by the Methodists, Baptists and Catholics.

Charities and Correction.—The state supports many philanthropic and penal institutions: institutions for the deaf and blind of both races; hospitals for the insane of both races; a school for feeble-minded children; training schools for wayward white boys and girls; and a reformatory school for Negro boys, etc.

Banking and Finance.—In 1941 there were 66 national banks with capital stock, surplus and undivided profits of $50,462,000, deposits of $233,731,000 and total assets of $268,659,000; 151 state banks with a capital stock surplus and undivided profits of $22,224,499, deposits of $96,320,940 and total assets of $111,644,594. Revenue sources include a property tax, income tax, sales tax, privilege taxes and levies on gasoline, tobacco, beer and liquor. Receipts for the fiscal year 1939–40 were $66,128,786; disbursements, $65,046,810; state debt, $64,703,000.

Agriculture.—The total income of farmers in Alabama in 1940 was $115,463,000, divided as follows: cash income from crops, $62,006,000; cash income from livestock, $27,606,000; government payments, $25,851,000. In 1939 farm lands and buildings were valued at $408,782,488.

Table I.—*Leading Agricultural Products of Alabama, 1941 and 1940*

Crop	1941	1940
Corn, bu.	50,580,000	43,450,000
Oats, bu.	4,875,000	3,000,000
Cotton, bales	768,000	770,000
Potatoes, bu.	5,400,000	4,176,000
Peanuts, lb.	210,000,000	205,800,000
Tame and wild hay, tons	747,000	636,000
Tobacco, lb.	362,000	415,000

Table II.—*Principal Mineral Products of Alabama, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Pig iron	$43,902,681	$29,190,091
Coal	27,708,000	26,769,000
Coke	10,917,550	9,888,292
Iron ore	9,971,024	7,341,620
Cement	6,690,765	6,114,240
Stone	2,516,584	1,809,379
Clay products	2,306,712	1,487,067

Manufacturing.—In 1939 there were 2,052 manufacturing establishments hiring 126,215 workers and producing goods valued at $574,670,690. The leading manufactures were cotton textiles (valued at about $92,000,000; spindles in operation, 1,835,909), iron and steel and electricity. Corporation and municipal production of electricity amounted to about 900,000 h.p., and the TVA plants were capable of producing slightly more. There were more than 6,000 mi. of rural electric lines. Other important industries: lumber, blast furnace products, cast iron pipes and fittings, coke oven products, cotton-seed oil and meal, paper, aluminum, cement, chemicals, fertilizers, meat packing and shipbuilding. War demands caused expansion of old industries and the rise of new industries, such as powder manufacturing, in 1941.

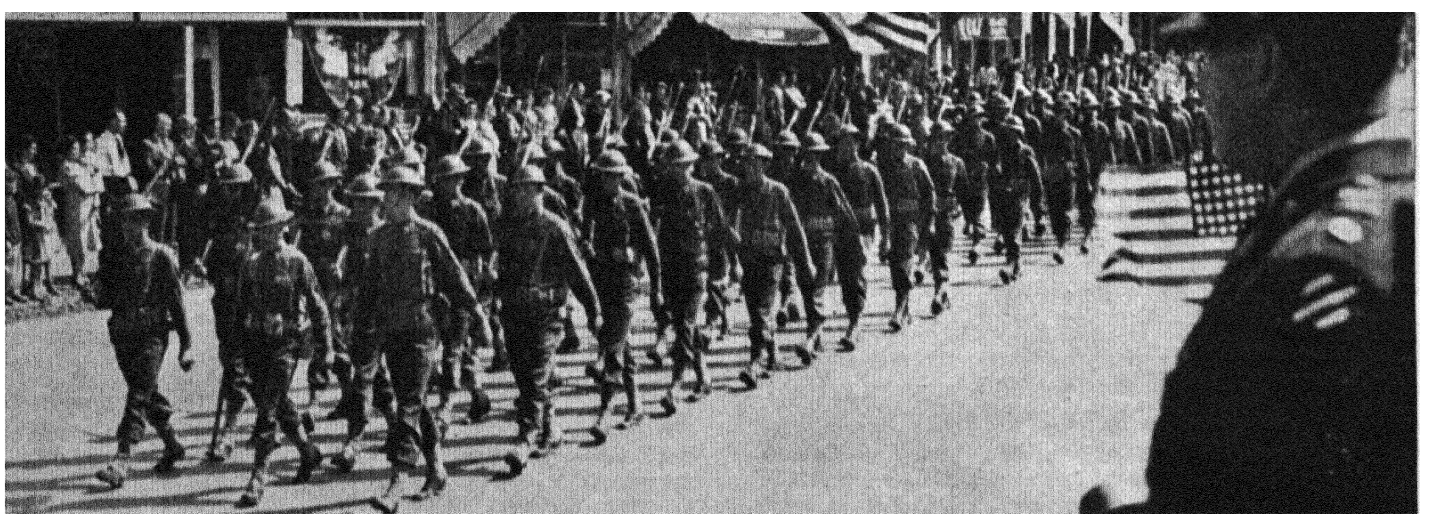
Mineral Production.—The total value of Alabama's mineral production in 1939 was $54,124,382; in 1938 it was $46,296,293. (A. B. Mo.; X.)

Alaska. Alaska, one of the two incorporated territories of the United States, 586,400 sq.mi. in extent, approximately one-fifth of the area of the 48 states, lies between the meridians 130° W. longitude and 173° E. longitude and between the parallels of 51° and 72° N. latitude. It is bounded on the north by the Arctic ocean, on the west by the Arctic ocean, Bering strait and Bering sea, on the south and southwest by the Pacific ocean, and on the east by Canada. The eastern boundary from the Arctic ocean to the Pacific in the neighbourhood of Mt. St. Elias is the 141st meridian; thence eastward to Portland canal the boundary is irregular but runs approximately parallel to the shore at a distance some 30 mi. inland.

In the year 1941, the territory reached an all-time high in population. The 1940 census (actually taken in Alaska Oct. 1, 1939, six months earlier than in the states) showed a total population of 72,524—an increase of 22.3% over the 1930 figure of 59,278 and substantially higher than the previous high in 1910 of 64,356. The taking of the census, however, preceded the inauguration of a far-flung national defense program in Alaska, which by the end of the calendar year 1941 approached $200,000,000. Not counting the troops stationed in Alaska, it is conservatively estimated that the population of the territory at the end of 1941 exceeded 80,000.

History.—Military and naval construction, begun in 1940, was greatly increased in 1941 and included the establishment, with the navy posts at Sitka, Kodiak and Dutch Harbor, of army posts respectively named Fort Ray, Fort Greeley and Fort Mears. A

THE FOURTH OF JULY, 1941, was celebrated in Anchorage, Alaska with a parade of newly-arrived U.S. troops



new post at Seward, southern terminus of the Alaska railroad, was named Fort Raymond—all these after army officers who had rendered distinguished service in the territory in earlier days. The seat of the Alaska defense forces at Fort Richardson, near Anchorage, was put under the command of a major general, with a brigadier in direct command of Fort Richardson itself. A great program of military and commercial airports and flying fields was also well under way, with major fields at Annette island—to serve Ketchikan, the southern gateway to the territory—at Juneau, Yakutat, Cordova, Seward, Bethel, Nome, East Ruby, Big Delta and Moose Creek, just west of the Alaska-Yukon territory boundary near the Tanana river. The construction on Ladd field near Fairbanks as an experimental station for fliers was completed. Commercial radio-beam stations, previously lacking in Alaska, were likewise installed. An important by-product of the defense program was the construction begun and well under way in 1941, of a trunk highway from Palmer to Copper Center connecting the Anchorage and Fairbanks system of roads and making a total central road network in Alaska of 1,392½ mi. The territorial legislature, convening in the spring of 1941, enacted for the first time a territorial traffic law.

Commerce.—The salmon run in southeastern Alaska during the 1941 season was unprecedented in size. For the fiscal year ending June 30, 1940 gold production also reached unprecedented levels; namely, $26,178,000. Tourist travel was impaired by the requirements of defense personnel and the withdrawal of certain steamers for defense purposes elsewhere. The year 1941 was the most prosperous year in Alaska's history. The defense program brought great activity throughout the territory, and wages soared to unprecedented heights. (E. GRU.)

Alaskan Highway: *see* ROADS AND HIGHWAYS.

Albania. A kingdom, united with the Italian empire, in the western part of the Balkan peninsula. Area, 10,629 sq.mi.; population (census 1930) 1,003,124. Capital, Tirana. Chief cities: Tirana (30,806); Scutari (29,209); Kortcha (22,787); Elbasan (13,796); Valona (9,100). Religion: Mohammedans (688,280); Orthodox Christians (210,313); Roman Catholic (104,184). King: Victor Emmanuel III, king of Italy. Prime minister: Mustafa Merlika Kruja.

History.—Albania shared during 1941 the general fate of the Balkan peninsula. At the beginning of the year the Italian fascist troops under strong Greek pressure were everywhere in retreat and the Greek armies were in occupation of a large part of Albanian territory in the east and in the southeast of the country, where they restored the Albanian law as it had existed before the fascist invasion of the country on Good Friday, 1939, and its union with Italy. In the first months of 1941 the Greeks succeeded in holding all Italian attempts at a reconquest of the lost territory, and even expanded their hold on the country. On Jan. 10 they captured Klisura and pressed toward Tepeleni. In March Premier Mussolini himself visited the Albanian front and assumed personal direction of the operations. Nevertheless the Italian offensives all failed with very heavy losses for the fascist army. Neither, however, were the Greek forces strong enough to capture the long-assaulted Tepeleni on the central front and Valona on the sea. But the Albanian situation changed fundamentally, not through any Italian efforts but through Germany's active participation in the war against Greece. On April 6, 1941, the German forces began active operations against Yugoslavia and Greece. By April 18 the Yugoslav army had surrendered, the Greeks were pushed far back and were unable to hold the Albanian front any longer. Under these conditions the Italians could reoccupy the parts of Albania evacuated by the Greeks, and on April 22 even cross the Greek frontier. The next day the Greek army in the Epirus surrendered to the advancing Germans (*see* WORLD WAR II).

From that moment Albania came again under fascist administration, and fascist laws were reintroduced throughout the country. With the Italian occupation of large parts of Yugoslavia and Greece certain rectifications of the Albanian frontier, by the inclusion of Greek and Yugoslav parts, were envisaged.

Education, Finance, Trade.—Albania had, in 1939, 663 state elementary schools with 38,988 boys and 17,948 girl pupils; in addition, 18 secondary schools for boys and one for girls. The Albanian currency is pegged to the Italian currency. An Albanian franc equals 6.25 lire (32.89 cents U.S., June 1941). In the last year of normal independent Albanian life, in 1938, the imports amounted to 22,397,890 Albanian francs (of which 8,337,109 came from Italy, 1,350,413 from the U.S.A.), the exports to 9,749,959, of which there went to Italy 6,665,257 and to the U.S.A. 435,537. Chief articles of export were hides and furs, wool, cheese and cattle; chief articles of import were cotton and cotton goods, corn and sugar.

Communication and Minerals.—Albania had no railroads in use in 1941, but the Italians have very much improved, for military reasons, the road system, though communications outside the main roads remained primitive in 1941. The main port of the country is Durazzo. With the economic life of the country still on a very primitive level, there exists practically no modern industry. The Italians have made efforts to exploit the mineral resources of the country, especially oil and copper. (*See* also GREECE; ITALY.)

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Alberta. The most westerly of the prairie provinces of Canada, Alberta was created a province by act of the dominion parliament Sept. 1, 1905. Area, 255,285 sq.mi.; the population by the census of 1941 was 788,393. Seat of government, Edmonton (92,404). The principal cities and their populations (1941 census) are: Calgary (87,264), Lethbridge (14,238) and Medicine Hat (10,473). The province sent 17 members to the house of commons at Ottawa, and six senators to the Canadian senate, as of 1941.

History.—William Aberhart, the premier in 1941, was first elected to office Sept. 3, 1935, at the head of a new party, called the Social Credit party. His government was returned to office at the general elections held in March 1940, securing 36 out of the 57 seats—a loss of 11 seats when compared with 1935. All attempts to put the social credit plan into operation had failed by 1941, and all unorthodox monetary and financial legislation passed by the Alberta legislature had been declared *ultra vires* by the supreme court of Canada, as for example, in Dec. 1941, the Alberta Debt Adjustment act of 1937.

Education.—The province has autonomous control over formal education. In 1939, daily average school attendance was 138,392; teachers numbered 5,963; government grants and tax revenue amounted to $10,196,906.

Communication.—In 1940 there were 3,456 mi. of surfaced roads and 12,309 mi. of improved earth roads. Total expenditure for 1939 was $3,749,141.

Finance.—The province continued to default on its bond maturities during the year. The total in default as of Dec. 1, 1941, was slightly in excess of $22,000,000. Ordinary revenue (1940) was $24,410,040; ordinary expenditure, $21,922,189.

Agriculture.—The following figures as reported by the Dominion bureau of statistics, show the value of the principal field crops for 1941: wheat, $43,200,000; oats, $22,630,000; barley, $9,720,000; rye, $760,000; flaxseed, $1,331,000; potatoes, $1,222,000; hay, clover, $3,775,000; alfalfa, $2,183,000; grain hay, $6,500,000, and sugar beets, $1,782,000. The total value of crops in 1941 was $93,331,000, as compared with $139,659,000 in 1940.

Mineral Production.—The production of crude oil in Canada for 1941 reached an all-time high of some 9,990,000 barrels. Of this volume, 97% was produced from the Turner valley field, which showed an increased output of 15% over 1940. The producing rate for this field, as assigned by the Alberta Petroleum and Natural Gas Conservation board for the conservation and maximum economic recovery of the oil and gas resources, was supplemented by the production stabilization program of the oil controller for an increased volume of output and a uniform rate of production during 1941. Thirty-nine new wells were completed up to Dec. 1, 1941. Exploratory drilling resulted in an extension of 1¼ mi. to the known productive area in the north end of the Turner valley. During the year the production of crude oil was commenced from the bituminous deposits of Athabaska, and some deliveries of refined products were made at McMurray.

(J. T. C.)

Albertini, Luigi (1871–1941), Italian journalist and politician, was born Oct. 19 at Ancona. He was named to the senate in 1914. Albertini was editor and chief owner of *Il Corriere della Sera*, Milan newspaper, from 1909 until 1925, when he was ousted by Mussolini for his outspoken criticism of fascism. A Berne dispatch of Dec. 30 carried the news of his death in Rome. (See *Encyclopædia Britannica.*)

Alcoholic Intoxication: *see* INTOXICATION, ALCOHOLIC.

Alcoholic Liquor: *see* BREWING AND BEER; LIQUORS, ALCOHOLIC; WINES.

Alexander, Robert (1863–1941), U.S. general, was born Oct. 17 in Baltimore, Md. He quit his law practice in 1886 to join the army and saw service in the Sioux Indian campaigns of 1890–91, the Spanish-American War, the Philippine insurrection and the Mexican campaign. During World War I he rose swiftly from the rank of colonel to major general and was placed in command of the 77th division in Aug. 1918. His troops participated in the Vesle-Aisne advance, the Argonne drive and the big push on Sedan in 1918. Gen. Alexander, who was awarded the D.S.C. and the Croix de Guerre, retired from the army in 1927. He died at the Veterans' Administration hospital in the Bronx, N.Y., Aug. 26.

Alfalfa. Production of alfalfa hay in the United States in 1941 was 32,346,000 tons from 14,929,000 ac., compared with 30,206,000 tons from 13,908,000 ac. in 1940, and a ten-year (1930–39) average, including two extreme drought years, of 24,907,000 tons from 12,867,000 ac. The yield was 2·17 bu. per ac. in 1941 and in 1940, the ten-year average yield being 1·93 bu. per ac. Nearly a quarter of the crop was from three states: Michigan, Wisconsin and Minnesota. Production of alfalfa seed in 1941 was 1,017,100 bu. (61,026,000 lb.), 32% under the output of 1,489,900 bu. (89,394,000 lb.) in 1940. The ten-year average was 1,028,220 bu. (61,693,200 lb.). The 1941 acreage harvested for seed was 791,000 compared with 962,700 ac. in 1940 and a ten-year average of 556,150 ac. The 1941 yield was 1·29 bu. per ac.; 1·55 bu. in 1940 and a ten-year average of 1·87 bu. (*See* also HAY.)

U.S. Alfalfa Hay Production in Leading States, 1941 and 1940

State	1941 tons	1940 tons	State	1941 tons	1940 tons
California . . .	3,198,000	3,477,000	Illinois	1,370,000	1,157,000
Minnesota . .	2,776,000	2,264,000	Colorado . . .	1,363,000	1,196,000
Wisconsin . . .	2,698,000	2,866,000	Kansas	1,247,000	882,000
Iowa	2,502,000	2,120,000	Montana . . .	1,147,000	963,000
Idaho	1,911,000	1,950,000	Nebraska . . .	1,106,000	764,000
Michigan . . .	1,813,000	2,202,000	Utah	1,043,000	948,000

(S.O.R.)

Alfonso XIII: *see* ALPHONSO XIII.

Algeria: *see* FRENCH COLONIAL EMPIRE.

Aliens: *see* CENSUS, 1940: *Race and Nativity;* IMMIGRATION AND EMIGRATION.

Alimentary System, Disorders of. **Disorders of the Oesophagus.**—Camiel and Loewe state that features common to all tumours involving the upper third part of the oesophagus are: location at or near the uppermost portion, paralysis or paresis of one or both vocal cords, inability to swallow, aspiration of food into the tracheobronchial tree, pulmonary complications due to aspiration, and the frequent occurrence of club fingers. With the oesophagoscope Faulkner showed that disturbing thoughts and emotions produce generalized oesophageal spasm, and that certain oesophageal strictures, cardiospasm and pressure diverticula can have their origin in disturbing emotional influences. Garlock believes that the skilled surgeon approaches the serious problem of oesophageal carcinoma with gradually increasing chances of some success from proper operative procedures.

Stomach and Duodenum.—Reports from army and navy hospital centres in Britain and from recruiting centres in Canada lend clinical proof that dyspeptic persons are the largest single group of patients in the armed forces. Difficulties of digestion, from several points of view, constitute the most important medical problems of the war. About one in four dyspeptic persons has a gastric or duodenal ulcer, the latter predominating.

Little advance has been made in the recognition of gastric cancer in its earlier, operable stages. In a consideration of the early roentgenologic diagnosis of this disease Bücker included Konjetzny's description of the macroscopic appearance of the smaller cancers: (1) well defined verrucose, crusted or polypoid mucosal thickening, (2) circumscribed flattened, frequently small, inconspicuous mural thickening with superficial irregular erosions, (3) large superficial erosions with mucosal rims, giving the impression of superficial ulcers, (4) saucerlike shallow ulcers, and (5) typical chronic ulcers. The fact that gastric cancer can masquerade as benign ulcer, not only with the symptoms and signs, but occasionally even reacting in response to treatment, is being amply confirmed by competent observers. The intravenous and intramuscular use of coagulants derived from shepherd's-purse, having as their active principle oxalic acid and related dicarboxylic acids, in the treatment of acute haemorrhage, and diacetyltannin-silver-protein compound in the treatment of inflammatory states of the gastro-intestinal mucous membrane, deserves an extended trial. (*See* also CANCER.)

Biliary Tract and Pancreas.—In the United States the traditional use of the high carbohydrate, low fat and protein diet in the treatment of diseases of the biliary tract is undergoing revision. Experimental and clinical observations confirm the importance of an adequate intake of protein. The protective action of a high protein diet for the liver against the necrotizing action of certain anaesthetic agents and the deleterious influences of other hepatotoxins such as arsphenamine have been demonstrated by Ravdin and others. In the treatment of hepatic cirrhosis Patek and Post advocated a nutritious diet containing a moderate amount of protein (114 gm.) and fat, and dietary supplements rich in the vitamin B complex. Broun and Muether have had encouraging results with a diet low in animal fat and cholesterol, the use of casein and vegetable proteins, and the administration of a 25% watery solution of flavoured choline chloride.

The principal clinical features in a series of 18 cases of pancreatic lithiasis were, according to Snell, colic, motor disturbances of the stomach and small intestine, diabetes, actual and latent, loss of weight and fatty diarrhoea. The diagnosis depends chiefly on the roentgenologic evidence of stones.

Intestines.—Sulphonamides loom increasingly important in the medical and surgical treatment of intestinal disturbances. Bacillary dysentery and other infections caused by the so-called colon-typhoid-dysentery group of organisms are reported to respond favourably to this form of chemotherapy. Sulphanilylguanadine is particularly recommended because of its low toxicity. Whether it possesses any real advantage over the other sulphonamides remains to be seen. Fatalities arising from acute appendicitis and its complications seem likely to be reduced by the augmentation of chemotherapy with intelligently used gastrointestinal decompression. The curative effect of sulphanilamide and sulphapyridine in the treatment of abdominal as well as other forms of actinomycosis appears to be confirmed by the observations of Dorling and Eckhoff.

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(G. B. EN.)

Allergy. The question whether sensitivity in humans (allergy) is comparable to similar conditions in animals (anaphylaxis) is of more than academic interest, because of the application of observations in animal experiments to allergy in humans. The relationship of the two conditions was demonstrated by the study of typical spontaneous hay fever in a dog (Wittich). The animal gave positive skin, eye and nasal reactions to the suspected pollens. The similarity of anaphylaxis (induced sensitization in animals) and allergy was confirmed by Cohen and Weller, who succeeded in demonstrating the presence of antibodies known as precipitins in the blood of typically allergic patients. Such antibodies heretofore had been found only in the blood of sensitized animals, particularly in rabbits.

Another interesting contribution in the field of experimental sensitization was reported by Loveless. Three non-allergic patients who were suffering from incurable conditions permitted themselves to be transfused with the blood of pollen-sensitive cases. All three developed symptoms of pollen sensitivity lasting up to 24 days.

A number of new causes for allergic symptoms were reported during 1941. A patient with hives of 15 months' duration was found sensitive to acrolein and other common, related aldehydes (Rappaport and Hoffman). Since acrolein is common as a combustion product of fats, as in the frying of foods, and since many aldehydes (in perfumes and aromatic foods) are related to acrolein, it may indicate a new and important cause of allergic symptoms. Ascher reported nasal allergy caused by the use of psyllium seeds as a laxative. To the many known causes of asthma were added paprika (Gelfand), and gum acacia (Bohner, *et al.*). While acacia was previously reported as a rare cause of allergy, the authors found ten patients with asthma due to its use as an offset spray in printing. Insect emanations, as a cause of asthma, were given added importance by the reports of asthma due to moths (Urbach), to beetles (Sheldon and Johnston), and to a crustacean known as the water flea (Way).

Most important contributions were toward improvement in the treatment of pollen sensitivity. Most of the work was limited to changes in pollen solutions involving the preparation of a material which would be absorbed more slowly, and would permit fewer injections for immunization. Spain and his co-workers reduced the rate of absorption of pollen by adding gelatin to the solution, with excellent results in the treatment of a group of patients. Strauss and Spain reported the chemical union of ragweed pollen with sulphanilic acid. This conjugated product retained its potency as demonstrated by skin tests. Naterman reported excellent results in 90% of hay fever cases treated with a tannic acid precipitate of pollen.

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(B. Z. R.)

Allocations and Allotments: *see* BUSINESS REVIEW; SUPPLY PRIORITIES AND ALLOCATIONS BOARD.

Alloys: *see* BERYLLIUM; MAGNESIUM; METALLURGY; MOLYBDENUM; MONAZITE; NICKEL; TITANIUM; VANADIUM.

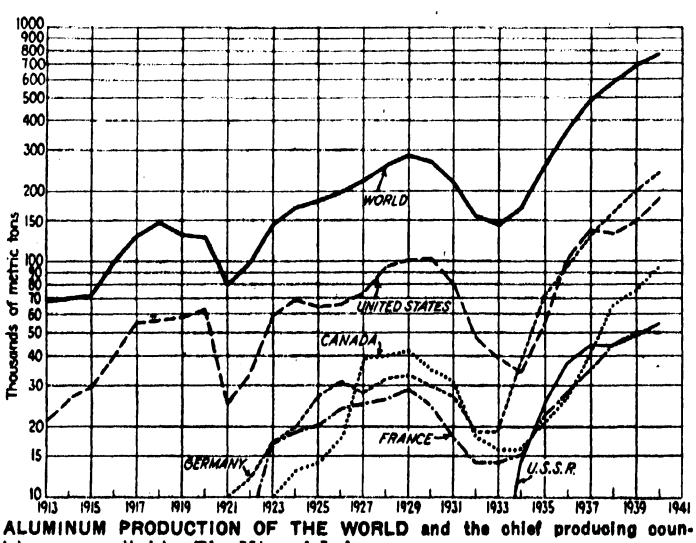
Alphonso XIII (1886–1941), king of Spain, was born May 17 in Madrid. Two weeks before his death the former monarch issued a manifesto, renouncing his rights to the throne in favour of his son, Don Juan, whom a monarchist faction hailed as the future Juan III. In 1939 the Franco government decreed the restoration to Alphonso of property valued at about $8,500,000, which had been confiscated by the Spanish republic in 1932, the year after he fled the throne. He died in Rome, Feb. 28. The Franco government granted permission for his burial in the royal pantheon of the Escorial near Madrid. For his earlier career see *Encyclopædia Britannica.*

Aluminum. The estimated world production of aluminum (also spelled aluminium) increased from 670,000 metric tons in 1939 to 785,000 tons in 1940, of which 240,000 tons are attributed to Germany, 188,000 tons to the United States, 95,000 to Canada, 55,000 to the Soviet Union, 50,000 to France, 36,000 to Italy, 32,000 to Japan, 29,000 to Switzerland, 20,000 to Norway, and smaller amounts to minor producers. No estimates were received for 1941, but the growing demand for military uses assures an even greater increase in 1941 than that of 1940.

The United States output increased 29% in 1940, to 206,280 short tons and would show a further heavy increase in 1941. No specific figures had been made public, but an expansion program that called for an output of about 340,000 tons by midyear was known to have been approximately achieved, and good progress was reported on further additions that would add a similar tonnage early in 1942, and still further additions would probably be made. Secondary recovery increased to 68,045 tons in 1940, and was expected to keep pace with new output in 1941. Demand from abroad kept exports well ahead of imports during 1939 and 1940, but in 1941 exports were limited and this, in connection with lack of accessibility to foreign sources of supply, cut both imports and exports to below normal.

Following a reduction in price from 20 cents per lb. to 17 cents during 1940, the price was further reduced to 15 cents on Oct. 1, 1941.

Production conditions outside of the United States were kept so well under cover that only inferences can be drawn. The distance between Great Britain and sources of bauxite supply made it likely that there would be little increase in British production, as it was more feasible to take British Guiana bauxite to Canada, and such increases as might be made were more likely to come in Canada than in Britain. Two-thirds of the Russian capacity was on the Dnieper river, and had presumably been destroyed. Germany had direct access to bauxite supplies in Hungary, Yugo-



ALUMINUM PRODUCTION OF THE WORLD and the chief producing countries, as compiled by *The Mineral Industry*

DISPLAYS OF USED ALUMINUM contributed by housewives and others to purposes of national defense appeared throughout the U.S.A. in the spring and summer of 1941

slavia and Greece, from Italy if needed, and probably from France as well; this assured a plentiful supply, and if German output were restricted in any way, it would not be likely to be from lack of ore supplies. Italian production probably was enlarged, and also that of Japan. While the Norwegian smelters were entirely under German control, it was expected to be extremely difficult to keep them supplied with ore, and it was doubtful if they could be kept going. While Switzerland was still nominally independent of German control, the smelters were dependent on ore supplies that were under complete German control, so that it was likely that Swiss production was in 1941 largely for German benefit. The growing subservience of Vichy France to German domination probably put both the French ore supplies and smelters under German control insofar as they might have been needed, even though they were located in the unoccupied area. (*See* also CYROLITE.) (G. A. Ro.)

Ambassadors and Envoys.

The following is a list of ambassadors and envoys to and from the United States and to and from Great Britain Jan. 1, 1942.

To and From the United States

(*=ambassadors; unstarred, envoys.)

To the United States	*Country*	*From the United States*
*Espil, Felipe A.	Argentina	*Armour, Norman
Casey, Richard G.	Australia	Johnson, Nelson T.
*Straten-Ponthoz, Count Robert van der	Belgium	*Biddle, Anthony J. D., Jr.[3]
Guachalla, Dr. Luis F.	Bolivia	Jenkins, Douglas
*Martins, Carlos	Brazil	*Caffery, Jefferson
McCarthy, Leighton	Canada	Moffat, Jay Pierrepont
*Michels, Rodolfo	Chile	*Bowers, Claude G.
*Hu Shih, Dr.	China	*Gauss, Clarence E.
*Turbay, Dr. Gabriel	Colombia	*Braden, Spruille (absent)
Fernández, Dr. Luis	Costa Rica	Lane, Arthur Bliss
*Concheso, Dr. Aurelio F.	Cuba	*Braden, Spruille (appointed)
Hurban, Vladimír	Czechoslovakia	Biddle, Anthony J. D., Jr.[3]
Kauffmann, Henrik de	Denmark	Atherton, Ray (absent)
Troncoso, Dr. J. M.	Dominican Rep.	Scotten, Robert M.
*Alfaro, Capt. Colón E.[1]	Ecuador	Long, Boaz
Hassan Bey, Mahmoud	Egypt	Kirk, Alexander C.[4]
Brennan, Robert	Eire (Ireland)	Gray, David
Castro, Dr. Hector D. (absent)	El Salvador	Frazer, Robert (absent)
Kaiv, Johannes[2]	Estonia	. . . . .
Procopé, Hjalmar J.	Finland	Schoenfeld, H. F. Arthur
*Henry-Haye, Gaston	France	*Leahy, William D.
*Halifax, Viscount	Great Britain	*Winant, John G.
Diamantopoulos, Cimon P.	Greece	Biddle, Anthony J. D., Jr.[3]
Recinos, Dr. Adrian	Guatemala	Des Portes, Fay A.
Dennis, Fernand	Haiti	White, John C.
Caceres, Dr. Julian R.	Honduras	Erwin, John D.
Thors, Thor	Iceland	MacVeagh, Lincoln
Schayesteh, Mohammed	Iran	Dreyfus, L. G., Jr.[5]
Bilmanis, Dr. Alfred	Latvia	. . . . .
Žadeikis, Povilas	Lithuania	. . . . .
Le Gallais, Hugues	Luxembourg	Moffat, Jay Pierrepont[6]
*Castillo Nájera, Dr. Francisco	Mexico	*Messersmith, George S. (appointed)
Loudon, Dr. A.	Netherlands	Biddle, Anthony J. D., Jr.[3]
DeBayle, Dr. León	Nicaragua	Boal, Pierre de L.
Munthe de Morgenstierne, Wilhelm	Norway	Biddle, Anthony J. D., Jr.[3]
*Jaén Guardia, Ernesto.	Panama	*Wilson, Edwin C.
Soler, Dr. Juan José	Paraguay	Frost, Wesley
*Freyre y Santander, Manuel de	Peru	*Norweb, R. Henry
*Ciechanowski, Jan	Poland	*Biddle, Anthony J. D., Jr.[3]
Bianchi, João A. de	Portugal	Fish, Bert
*Cárdenas, Juan F. de	Spain	*Weddell, Alexander W.
Boström, W.	Sweden	Sterling, Frederick A.
Bruggmann, Charles	Switzerland	Harrison, Leland (absent)
Seni Pramoj, Rajawongse	Thailand	. . . . .
*Ertegün, Mehmet M.	Turkey	*Steinhardt, Laurence A. (appointed Jan. 1942)
Close, Ralph W.	Union of South Africa	Keena, Leo J.
*Litvinov, Maxim	U.S.S.R.	*Steinhardt, Laurence A. (absent)
*Blanco, Dr. Juan C.	Uruguay	*Dawson, William
*Escalante, Dr. Diógenes	Venezuela	*Corrigan, Frank P.
Fotić, Constantin	Yugoslavia	Biddle, Anthony J. D., Jr.[3]

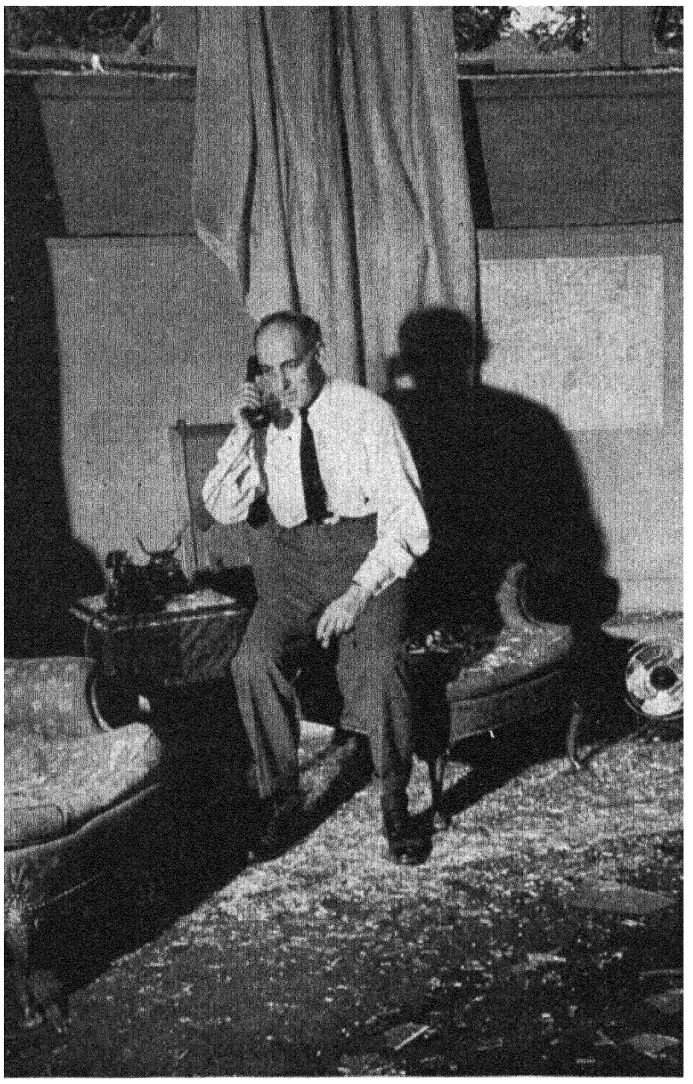
[1]Rank of ambassador for duration of boundary negotiations between Ecuador and Peru. [2]Acting consul general, in New York city. [3]Accredited to governments of Belgium, Czechoslovakia, Greece, The Netherlands, Norway, Poland and Yugoslavia, all established in England. [4]Accredited also to Saudi Arabia; resident in Cairo. [5]Accredited also to Afghanistan; resident in Tehran. [6]Minister to Canada but accredited also to government of Luxembourg, established in Canada.

To and From Great Britain

(*=Ambassador; unstarred=Envoy-Extraordinary; ‡=Minister Resident; §=Chargé d'Affaires.)

To Great Britain	*Country*	*From Great Britain*
Sardar Ahmed Ali Khan	Afghanistan	Wylie, Sir F. V.
Carcano, Dr. Miguel Angel	Argentina	*Ovey, Sir Esmond
*de Marchienne, Baron E. de C.	Belgian Govt.	*Oliphant, Sir Lancelot (returned to London Sept. 30, 1941)
Patiño, Antenor	Bolivia	Dodds, J. L.
*de Aragão, J. J. Moniz	Brazil	*Charles, Sir Noel N. H.
*Bianchi, Manuel	Chile	*Orde, Sir Charles W.
*Koo, Dr. V. K. Wellington	China	*Kerr, Sir Archibald Clark
Jaramillo Arango, Dr. Jaime	Colombia	Snow, T. M.
(*Vacant*)	Costa Rica	§Lyall, G.
de Blanck, Guillermo	Cuba	Ogilvie-Forbes, Sir G.
Lobkowicz, Maximilian	Czechoslovak Provis. Govt. (in London)	[1]Nicholls, P. B. B.
[2]Reventlow, Count Eduard	Denmark	. . . . .
Henriquez-Ureña, M.	Dominican Republic	‡Paterson, A. S.
§Puig-Arosemena, Alberto	Ecuador	‡Bullock, G. H.
*Hassan Nashat Pasha	Egypt	*Lampson, Sir Miles
Torma, August	Estonia	. . . . .
Simopoulos, Charalambos	Greece	Palairet, Sir Charles M.

[1]British representative. [2]Charged informally with the protection of certain Danish interests not under enemy control.



LAURENCE A. STEINHARDT, U.S. ambassador to the U.S.S.R., conducted business as usual July 24, 1941, the morning after a German bomb had spattered the Moscow embassy with wreckage

To Great Britain	*Country*	*From Great Britain*
§Figueroa, Dr. Francisco A.	Guatemala	[3]Leche, J. H.
. . . . .	Haiti	‡Hillyer, R. A. N.
. . . . .	Honduras	Kemball, C. G.
§Benediktsson, Pétur	Iceland	Smith, C. Howard
Mohammad Ali Moghaddam	Iran	Bullard, Sir R. W.
§Sayid Ata Amin	Iraq	*Cornwallis, Sir K.
Zarine, Charles	Latvia	. . . . .
‡de Lynden, Baron Robert Aernout	Liberia	§Routh, A. C.
Balutis, Bronius	Lithuania	. . . . .
Diaz, Alfonso R.	Mexico	Bateman, Harold
Gen. Shingha Shamsher Jung Bahadur Rana	Nepal	Betham, Lt. Col. G. L.
van Verduynen, Dr. Michiels	Netherlands Govt. (in London)	Bland, Sir N.
Herdocia, Dr. C.	Nicaragua	§Gooden, A.
Colban, E. A.	Norwegian Govt. (in London)	Collier, L.
§Sandoval, R. Rivera	Panama	Dodd, C. E. S.
(*Vacant*)	Paraguay	‡Brickell, D. F. H.
Benavides, A.	Peru	Forbes, V. C. W.
*Raczyński, Count Edward	Polish Govt. (in London)	*Dormer, Sir Cecil
*Monteiro, Dr. Armindo Rodrigues de Sttau	Portugal	*Campbell, Sir R.
(*Vacant*)	Salvador	§Henderson, I. L.
Sheikh Hafiz Wahba	Saudi Arabia	Stonehewer-Bird, F.H.W.
*The Duke of Alba	Spain	*Hoare, Sir Samuel
Prytz, Björn Gustaf	Sweden	Mallet, V. A. L.
Thurnheer, Walter	Switzerland	Kelly, D. V.
Vimolnart, Phra Manuvedya	Thailand	Crosby, Sir Josiah
*Aras, Dr. Tewfik Rüstü	Turkey	*Knatchbull-Hugessen, Sir H. M.
*Winant, John G.	United States	*Halifax, Viscount
Castellanos, Dr. Daniel	Uruguay	Stevenson, R. C. S.
*Maisky, Ivan	U.S.S.R.	*Cripps, Sir Stafford
Godfrey, Mgr. W. (Apostolic Delegate)	Vatican	Osborne, F. d'A. G.
Carnevali, Dr. Atilano	Venezuela	Gainer, D. St. C.
Soubbotitch, Ivan	Yugoslav Govt. (in London)	Rendel, G. W.

[3]Minister and consul-general.

American Academy of Arts and Letters.

This organization was founded in 1904 by the National Institute of Arts and Letters. It is an honorary educational body limited to 50 members, who are elected from the membership of its parent body, the National Institute of Arts and Letters, also an honorary educational body limited to 250 members qualified by notable achievement in art, music or literature.

Throughout 1941 a joint exhibition of the works of Childe Hassam and of Edwin Austin Abbey, both deceased members of the academy, was shown in the art gallery and was to continue indefinitely. The Abbey paintings were lent by Yale university. The art gallery and the permanent museum are open and free to the public from 1 to 5 P.M. weekdays (closed Mondays) and from 2 to 5 P.M. Sundays and holidays.

The officers of the academy for 1941 were: Walter Damrosch, president; James Truslow Adams, chancellor and treasurer; William Lyon Phelps, secretary. The other six directors were Stephen Vincent Benét, Van Wyck Brooks, William Adams Delano, Charles Dana Gibson, Deems Taylor and Chauncey B. Tinker. (F. GN.)

American Academy of Arts and Sciences.

The academy is limited to 800 fellows and 130 foreign honorary members, divided among four classes: mathematical and physical sciences, natural and physiological sciences, the social arts, the humanities. The officers for the year 1941 were: president, Harlow Shapley; corresponding secretary, Abbott P. Usher; recording secretary, Hudson Hoagland; treasurer, Horace S. Ford. The following papers were presented at regular monthly meetings: Tenny L. Davis, "The Identity of Chinese and European Alchemical Theory"; Edward L. Thorndike, "The Development, Retention and Attraction of Superior Men"; Fletcher G. Watson, "The Approaching Comet"; James G. Baker, "Trends in Astronomical Optics"; Donald H. Menzel, "Motions in the Solar Atmosphere"; Thomas Head Thomas, "The Hitler War and Hemisphere Defense"; Harold E. Edgerton, "Stroboscopic Light and its Applications"; Herbert Brown Ames, "Canada's Major Contribution in the Present War"; Kenneth J. Conant, "The Architectural Revolution: an Historical Background for the New Architecture in America."

May 14, 1941 awards were made from the Francis Amory fund for distinguished contributions to the treatment and cure of disease and derangement of the human genitourinary organs. Awards were made to Dr. Joseph F. McCarthy, to Dr. Carl Richard Moore, to Dr. Hugh H. Young, and to a scientist in nazi-occupied Europe whose name was withheld. The recipients of prizes gave brief descriptions of their work.

The following papers were read by title: Tenny L. Davis and Chao Yün-ts-'ung, "Four Hundred Word Chin Tan of Chang Po-Tuan"; J. H. Bartlett and R. E. Watson, "The Elastic Scattering of Fast Electrons by Heavy Elements"; Charles T. Brues, "Photographic Evidence on the Visibility of Color Patterns in Butterflies to the Human and Insect Eye."

Grants in aid of research were made from the Rumford fund, the C. M. Warren fund and from the Permanent Science fund. (A. P. U.)

American Academy of Political and Social Science.

On April 4 and 5, 1941 there was held the 45th annual meeting, with the general subject "Defending America's Future," the proceedings of which, together with a number of additional articles, appeared in the

July issue of *The Annals*. Other meetings included a session on "Canada and the United States" held on Feb. 4, at which the Hon. Athanase David of Ottawa, Canada and John MacCormac of Washington, D.C. were the speakers, with Dr. F. Cyril James of McGill university presiding; a meeting on March 4, addressed by Gerhard Colm of the treasury department, Prof. O. M. W. Sprague of Harvard university, and the Hon. Arthur A. Ballantine of New York, formerly undersecretary of the treasury, with Alexander Biddle of Philadelphia presiding, on "How to Finance National Defense"; and, on Nov. 14, a session on "When the War Ends," addressed by Señor Julio Alvarez del Vayo of Spain, Count Carlo Sforza of Italy and Sir Norman Angell of Great Britain.

The volumes of *The Annals*, the academy's bimonthly journal, are unique in that each is a symposium of some special subject of current interest. During 1941 the six issues, including the July volume, had the following titles: "New Horizons in Radio" (January); "Billions for Defense" (March); "America and Japan" (May); "Defending America's Future" (July); "Crime in the United States" (September); "Public Policy in a World at War" (November).

Student memberships, announced during 1940, totalled by the end of 1941 approximately 275. Under this arrangement students enrolled in educational institutions receive all of the privileges of regular membership, but at a cost of only $3 per year instead of the usual $5.

The officers for the year were: Ernest Minor Patterson, president; J. P. Lichtenberger, secretary; Charles J. Rhoads, treasurer; Thomas S. Hopkins, assistant treasurer; Herbert Hoover, Carl Kelsey and C. A. Dykstra, vice-presidents. Headquarters are at 3457 Walnut st., Philadelphia, Pa. (E. M. P.)

American Association for the Advancement of Science.

The officers of the American Association for the Advancement of Science for 1941 were Irving Langmuir, associate director of the research laboratory of General Electric company, president; Forest Ray Moulton, permanent secretary; Otis W. Caldwell, general secretary; Charles Carroll Morgan, treasurer; and Sam Woodley, assistant secretary. The retiring president, Dr. Walter B. Cannon, delivered an address on "The Body Physiologic and the Body Politic."

In 1941 the membership of the association passed 21,500. Its affiliated and associated societies, 181 in number, had a combined membership, including duplications, of nearly 1,000,000. The association held three meetings in 1941, its annual meeting in Philadelphia, Pa., which closed on Jan. 2, a joint meeting at Durham, N.H., June 23–28, and a meeting at Chicago, Ill., Sept. 22–27. The attendance at the annual meeting was about 6,000, including representatives from 46 states, four dependencies and nine foreign countries. At this meeting a total of 2,164 addresses and papers were delivered or read. The annual association $1,000 prize was awarded to Drs. D. R. Hoagland and D. I. Arnon for their investigations on plant nutrition. Eighteen grants in aid of research were given. One of the features of the meeting was a symposium on "Human Malaria," including 43 contributions by leading authorities, which has been published by the association as a 406-page volume. This is the 15th volume in its symposium series. *Strange Malady—The Story of Allergy*, by Dr. Warren T. Vaughan, was published during the year as one of the association's non-technical series. The June meeting was held in connection with the celebration of the 75th anniversary of the founding of the University of New Hampshire, and the September meeting in connection with the celebration of the 50th anniversary of the founding of the University of Chicago. (F. R. Mo.)

American Bankers Association.

The association was active in the banking field during 1940–41 under the administration of P. D. Houston, chairman of the board of the American National bank, Nashville, Tenn.

Four new divisions of the association, a consumer credit department, a department of research in real estate and mortgage loans, a department of customer relations and a department of economics, all of which were established tentatively during 1939–40, proved effective in their operations and were made a permanent part of the association's activities.

Both the new departments and the previously established divisions, sections and commissions of the A.B.A. devoted a substantial part of their efforts to problems dealing with national defense financing, working in co-operation with congress and various government departments and agencies.

Officers elected at the 67th annual convention of the association in Chicago, Sept. 28–Oct. 2, 1941, for the ensuing year were: president, Henry W. Koeneke, Ponca City, Okla.; first vice-president, W. Linn Hemingway, St. Louis, Mo.; second vice-president, A. L. M. Wiggins, Hartsville, S.C.; treasurer, William F. Augustine, Boston, Mass.; executive manager, Dr. Harold Stonier, New York, N.Y.; secretary, Richard W. Hill, New York, N.Y.; senior deputy manager, Frank W. Simmonds, New York, N.Y.; national bank division, president, W. C. Bowman, Montgomery, Ala.; vice-president, S. A. Phillips, Louisville, Ky.; savings division, president, Stuart C. Frazier, Seattle, Wash.; vice-president, W. W. Slocum, Detroit, Mich.; state bank division, president, James H. Penick, Little Rock, Ark.; vice-president, Frank P. Powers, Mora, Minn.; trust division, president, Richard G. Stockton, Winston-Salem, N.C.; vice-president, Louis S. Headley, St. Paul, Minn.; state secretaries section, president, William Duncan Jr., Minneapolis, Minn.; first vice-president, Fred Bowman, Topeka, Kan. (L. Gn.)

American Bar Association.

At the 1941 meeting in Indianapolis leading English, Canadian and Latin-American jurists discussed hemispheric solidarity and world order. During the year the committee on national defense, headed by Edmund R. Beckwith, organized state and local bar committees to co-operate in the administration of the Selective Service act, give free legal aid to men in service and their families, and furnish leadership in the maintenance of civilian morale. Under the chairmanship of Judge John J. Parker, the committee on improving the administration of justice promoted its nation-wide program to integrate the judiciary, improve the jury system, simplify trial and appellate practice and the rules of evidence, and improve the procedure of administrative tribunals.

Awards: annual medal of the association to George Wharton Pepper, former U.S. senator, for conspicuous service in the cause of United States jurisprudence; Ross prize of $3,000 to Willard Bruce Cowles of Washington, D.C., for an essay on "The Prospective Development of International Law in the Western Hemisphere as Affected by the Monroe Doctrine"; awards of merit to the Colorado Bar association and the Bar Association of St. Louis, Mo.

Elected at the 1941 meeting were: Walter P. Armstrong, president; Guy R. Crump, chairman of the house of delegates; Harry S. Knight, secretary; John H. Voorhees, treasurer; Joseph D. Stecher, assistant secretary. (M. Dn.)

American Bible Society.

The 125th annual meeting of the American Bible society was held in May 1941. John T. Manson is president. Gilbert

Darlington is treasurer. General secretaries are Rev. Dr. Eric M. North, in charge of translation and foreign activities, and Rev. Dr. Frederick W. Cropp, in charge of activities in the United States. Rev. Dr. Francis C. Stifler is editorial and recording secretary.

The society distributes about 3,700,000 volumes of Scripture annually in the United States. In co-operation with the British and Foreign Bible society, the Scottish Bible society and other missionary organizations, the Scriptures were translated into 1,051 languages up to the end of 1940, and more than 25,000,000 volumes of Scripture were distributed in 1940 throughout the world. The society's principal office is at Park avenue and 57th street, New York city, with branch offices in 11 cities in the United States and agencies, depositories and publishing offices in many other countries, in co-operation with the British and the Scottish Bible societies. The American Bible society elects a vice-president from each of the 48 states and among those so chosen have been Chief Justice Hughes, John R. Mott, William Lyon Phelps, J. L. Kraft and General Evangeline Booth. (F. C. St.)

American Chemical Society.

The society operates under a national charter from the 75th congress. In 1941 the presidency passed from Dr. S. C. Lind of the University of Minnesota to Dr. William Lloyd Evans of Ohio State university with Dr. Harry N. Holmes of Oberlin college as president-elect. Holmes became president Jan. 1, 1942. National meetings in St. Louis and Atlantic City showed attendances of 3,960 and 5,021 with 462 and 550 papers, respectively. The 96 local sections were more active than ever. The awards of the society: Karl A. Folkers, American Chemical society award in pure chemistry; David Rittenberg, Eli Lilly and company award; Claude S. Hudson, Borden award; Thomas Midgley, Jr., Priestley medal; Alexander Silverman, Pittsburgh award; Ferdinand G. Brickwedde, Hillebrand award; Linus Pauling, Nichols medal; Arthur W. Burwell, Schoellkopf medal; Edward A. Doisy, Willard Gibbs medal. Membership passed 28,000. (C. L. Ps.)

American Citizens Abroad.

The following is an estimate of the number of American citizens living abroad, as of Jan. 1, 1941, compiled from reports received from U.S. consulates in all parts of the world. This estimate includes only those whose residence abroad has a permanent or semipermanent character and therefore excludes tourists and all others whose sojourn abroad was considered to be only transitory.

Attention is called to the fact that because of the disturbed conditions existing in certain areas of the world, it has been impossible in many cases for consular officers to obtain exact figures as to the number of U.S. citizens residing in their respective districts. However, this statement, based on all available sources of information, may be considered as a reasonably accurate estimate of Americans living abroad as of Jan. 1, 1941.

SOUTH AMERICA	
Argentina	3,000
Bolivia	510
Brazil	4,240
Chile	1,281
Colombia	2,797
Ecuador	562
Paraguay	92
Peru	1,692
Uruguay	210
Venezuela	3,394
Total	17,787

MEXICO AND CENTRAL AMERICA	
British Honduras	160
Costa Rica	1,237
El Salvador	283
Guatemala	1,128
Honduras	1,076
Mexico	13,014
Nicaragua	649
Panama	7,222
Total	24,769

WEST INDIES AND BERMUDA	
Bahamas	235
Barbados	345
Bermuda	588
Cuba	5,531
Curacao	1,743
Dominican Republic	3,158
Haiti	467
Jamaica	703
Trinidad	637
Total	13,407

CANADA AND NEWFOUNDLAND	
Canada	164,354
Newfoundland	614
St. Pierre et Miquelon	9
Total	164,977

EUROPE		
Albania		170
Belgium		578
British Isles		6,145
Bulgaria		80
Czechoslovakia		218
Danzig, Free City of		10
Denmark		895
Estonia		38
Finland		337
France		3,000
Germany		5,111
Gibraltar		5
Greece		2,086
Hungary		358
Ireland		2,382
Italy		14,567
Latvia		70
Lithuania		140
Luxembourg		14
Malta		145
Netherlands		774
Norway		726
Poland		239
Portugal		5,855
Lisbon	589	
Oporto	536	
Madeira	230	
Azores	4,500	
Rumania		369
Spain and Canary Islands		2,185
Sweden		1,409
Switzerland		1,261
Union of Soviet Socialist Republics		213
Yugoslavia		1,521
Total		50,901

AFRICA	
Algeria	60
Belgian Congo	940
Egypt	552
Kenya	437
Liberia	261
Morocco	110
Nigeria	543
Union of South Africa	1,946
Tunisia	95
Total	4,944

ASIA	
Arabia	35
Ceylon	74
China	6,700
French Indo-China	124
Hongkong	1,280
India	3,509
Iran	117
Iraq	497
Japan	5,295
Netherlands East Indies	476
Palestine	8,500
Straits Settlements	450
Syria	1,446
Thailand	90
Turkey (including Turkey in Europe)	263
Total	28,946

FIJI ISLANDS	15
SOCIETY ISLANDS	13

AUSTRALIA AND NEW ZEALAND	
Australia	1,832
New Zealand	293
Total	2,125
GRAND TOTAL	307,884

The following information concerning persons procuring passports or renewals was compiled from passport and renewal applications received by the department of state during the calendar year ending Dec. 31, 1940.

OCCUPATION	
Accountant	385
Actor	223
Architect	69
Artist	159
Banker, broker	408
Buyer, exporter, importer	404
Clerk, secretary	1,840
Contractor	83
Doctor	459
Draftsman	63
Druggist	19
Engineer	1,496
Executive	1,467
Farmer, rancher	361
Florist	26
Housewife	3,194
Interior decorator	14
Labourer (common)	516
Labourer (skilled)	3,119
Lawyer	413
Librarian	59
Manufacturer	269
Merchant	406
Miscellaneous	695
Missionary	775
Musician	172
None	1,809
Nurse	400
Religious	506
Restaurateur	78
Retired	385
Salesman	1,018
Scientific	353
Servant	210
Student	2,270
Teacher	1,408
Technician	197
Tradesman	87
Writer	438
Total	26,253

DESTINATION	
Africa	396
Australia & New Zealand	570
Bermuda	1,945
Canada and Newfoundland	728
Eastern Europe	48
Far east	5,291
Latin America	15,508
Near east	607
Western Europe	1,528

OBJECT OF TRAVEL	
Commercial	3,628
Education	601
Employment	3,439
Family affairs	706
Health	185
Personal business	5,414
Pleasure	10,380
Professional	446
Religious	1,352
Scientific	102

APPLICANT	
Native	22,963
Naturalized	3,290
Male	16,661
Female	9,592

ADDITIONAL PERSONS INCLUDED IN PASSPORTS	
Adults	2,325
Minors	2,712

PREVIOUS PASSPORTS	
Number having been previously issued American passports	8,882

DISTRIBUTION BY STATES, 1940

Alabama	107	Nevada	38
Alaska	17	New Hampshire	61
Arizona	239	New Jersey	1,302
Arkansas	77	New Mexico	81
California	5,330	New York city	4,262
Colorado	197	*New York state	2,148
Connecticut	517	North Carolina	156
Delaware	79	North Dakota	22
Dist. of Columbia	333	Ohio	856
Florida	554	Oklahoma	280
Georgia	151	Oregon	208
Idaho	56	Pennsylvania	1,216
Illinois	1,364	Rhode Island	124
Indiana	265	South Carolina	68
Iowa	160	South Dakota	34
Kansas	126	Tennessee	118
Kentucky	95	Texas	1,067
Louisiana	407	Utah	144
Maine	113	Vermont	30
Maryland	297	Virginia	251
Massachusetts	1,200	Washington	462
Michigan	467	West Virginia	60
Minnesota	265	Wisconsin	216
Mississippi	85	Wyoming	31
Missouri	358		
Montana	87		26,253
Nebraska	72		

*Exclusive of New York city.

(R. B. S.)

Travel Outside the Western Hemisphere.—Because of the war, U.S. passports were not valid in 1941 for use in countries or territories outside the western hemisphere, unless the name of the country to be visited and the object of the visit were specifically stated on the passport by the department of state or under the department's authority. Persons desiring permission to travel outside the hemisphere were required to submit documentary evidence of the necessity for such trips. Citizens of the U.S. visiting countries within the hemisphere but travelling on belligerent vessels in the Atlantic ocean north of 35° N. lat. and east of 66° W. long. were required to obtain special permission from the department of state. Failure to do so might subject the traveller to prosecution under the terms of the neutrality act of 1939.

American College of Surgeons.

The college was founded in 1913 by 500 surgeons of the United States and Canada, under the leadership of the late Dr. Franklin H. Martin, to ensure a standard of professional, ethical and moral requirements for every graduate in medicine who practises general surgery or any of its specialties. Fellowship, 1942: 13,300. Chairman, board of regents, Dr. Irvin Abell, Louisville, Ky.; president, 1941–42; Dr. W. Edward Gallie, Toronto, Ont.; president-elect, Dr. Irvin Abell, Louisville, Ky.; treasurer, Dr. Dallas B. Phemister, Chicago, Ill.; secretary, Dr. Frederic A. Besley, Waukegan, Ill.; associate director and chairman, administrative board, Dr. Malcolm T. MacEachern, Chicago, Ill.; associate director, Dr. Bowman C. Crowell, Chicago, Ill.; assistant directors, Dr. E. W. Williamson and Dr. Harold Earnheart, Chicago, Ill. The organization originated hospital standardization, 1918, formulating minimum standards for approval and starting periodic surveys; 2,873 hospitals in United States, Canada and other countries were on the 1941 approved list; 376 cancer clinics in hospitals and 959 medical services in industry were approved in 1941. An approved list of medical motion picture films is also issued yearly. The college maintains a medical library and literary research department. The committee on graduate training for surgery was organized in 1937. Committees on cancer, archives of cancer, fractures and other traumas, and the Hall of the Art and Science of Surgery function through a department of clinical research. Sectional meetings were held in 1941 in Minneapolis, Minn.; Pittsburgh, Pa.; and Salt Lake City, Utah. The 31st Annual Clinical congress and the 24th Annual Hospital Standardization conference, attended by 3,000 surgeons and 1,500 hospital executives, were conducted by the college in Nov. 1941, in Boston, Mass. (M. T. M.)

American Economic Association.

The purpose of the American Economic association (founded in 1885) is to encourage economic research, issue publications on economic subjects, and stimulate thought and discussion of current problems from an economic point of view. The publications of the association consist of a quarterly, the *American Economic Review*, the *Proceedings* of the annual meetings, occasional monographs on special topics and a biennial handbook or directory of its membership and an information booklet. The program of the 54th annual meeting, held in New York city, in Dec. 1941, was devoted to current economic problems of vital importance affecting war and postwar adjustments.

Officers for the year 1942 were: president, Edwin G. Nourse, Brookings institution; vice-presidents, Frederic B. Garver, University of Minnesota; Frank D. Graham, Princeton university; secretary-treasurer, James Washington Bell, Northwestern university; elected members of the executive committee, J. Douglas Brown, Princeton university; George W. Stocking, University of Texas; Stacy May, Rockefeller foundation; Edwin E. Witte, University of Wisconsin; William L. Crum, Harvard university; Leonard L. Watkins, University of Michigan. The 1942 edition of the handbook, in the form of a specialized "who's who," contained a list of approximately 3,500 members and 1,300 libraries and other subscribers. (J. W. Bl.)

American Federation of Labor.

During 1941, as previously, the American Federation of Labor was mainly concerned with raising the level of life and work for the wage earners. The membership of the American Federation of Labor reached an all-time peak of 4,569,056 members in good standing as of Aug. 31, 1941—the time of the annual report.

The federation pledged its full and unqualified support of the government in its war program and subscribed to a no-strike policy on all defense projects. All unions were urged to forgo strikes during the period of the emergency. This means that the members of the American Federation of Labor voluntarily relinquished their right to strike on defense production for the duration of the war. At the same time the federation insisted that the workers be free from legislative restrictions on their economic rights, in the firm belief that the greatest benefit to all would accrue from voluntary action.

The federation continued its efforts to raise the living standards of the wage earners through increasing the share received by workers in accord with their increased productivity and resultant higher income from the industry to which they were attached. In its annual report the executive council of the federation called attention to the fact that American industry had been able to increase wages substantially and at the same time maintain profits.

The federation kept watch over pending legislative proposals to make sure that provisions were incorporated for the enforcement of labour laws and other government activities of particular interest to labour.

All efforts were made to prevent any impairment of the social gains made by labour in the past, such as fair labour standards and social security.

The executive council of the American Federation of Labor and international executives of affiliated organizations pledged wholehearted support to the government for the duration of the war in support of democratic principles. The federation and its affiliates invested millions of dollars in defense bonds and were expected to continue investments regularly.

The American Federation of Labor also urged advance planning

for postwar adjustments. (*See* also CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; STRIKES AND LOCK-OUTS; UNITED STATES: *History.*) (W. G.)

American Geographical Society. During the summer of 1941 the Fourth Wood Yukon expedition under the sponsorship of the American Geographical society was carried out under the leadership of Walter A. Wood, head of the society's department of exploration and field research, completing a program of aerial mapping begun in 1935 and continued on subsequent expeditions in 1937 and 1939. Mt. Wood (15,800 ft.) and Mt. Walsh (14,800 ft.) were both climbed in successful tests of the feasibility of supplying expeditions in mountainous terrain by parachute. A second expedition sponsored by the society and led by William O. Field, Jr., of the society's staff spent several weeks studying glacier changes in southeastern Alaska in continuation of the leader's earlier studies in the region. The topographical map of the Sierra Nevada de Santa Marta, Colombia, South America, constructed from aerial photographs taken in 1939 under the society's sponsorship by the Cabot Colombian expedition was completed and published. Only one gold medal award was made —the Charles P. Daly medal to Julio Garzón Nieto, chief of the office of longitudes and boundaries of the Colombian government.

The society's publications during the year included an addition to the Special Publications series entitled "Focus on Africa" (a volume of aerial photographs taken on a journey in their own plane from Capetown to Cairo, with accompanying narrative and geographical description, by Richard U. Light and Mary Light) and a brochure entitled "European Possessions in the Caribbean Area." Compilation and drafting was also completed on a 3-sheet map of Latin America on the scale of 1 : 5,000,000 based chiefly on the sheets of the society's map of Hispanic America on the scale of 1 : 1,000,000.

The publication of the society's quarterly journal, *The Geographical Review,* was continued during the year, and to its other periodical publication, *Current Geographical Publications* —a classified list of titles of books, articles and maps selected for inclusion in the Society's Research catalogue, which is issued in mimeographed form monthly except for July and August—a new section, consisting of an annotated list of published photographs of geographical interest, was added. (*See* also EXPLORATION AND DISCOVERY.) (R. R. P.)

American Historical Association was incorporated by act of congress in 1889 "for the promotion of historical studies . . . and for kindred purposes in the interests of American history and of history in America." It had (Oct. 1, 1941) a membership of about 3,600, chiefly recruited from the teachers and writers of history in U.S. and Canadian schools and colleges. Its national headquarters were in 1941 at study room 274, library of congress annex, Washington, D.C. It was governed by a council elected at the annual meeting and supported by annual dues ($5) and by the income of an endowment fund of about $250,000. Its officers for the year 1941 were: president, Arthur M. Schlesinger, Harvard university; first vice-president, Nellie Neilson, Mt. Holyoke college; second vice-president, William L. Westermann, Columbia university; treasurer, Solon J. Buck, the National Archives; executive secretary and editor, Guy Stanton Ford, Washington, D.C.; assistant secretary-treasurer, Patty W. Washington.

During 1941 it continued the publication of *The American Historical Review,* the leading historical journal in the U.S., and participated in the publication of *Social Education,* devoted to the problem of teaching the social studies in the school. (G. S. F.)

American Indians: *see* INDIANS, AMERICAN.

American Institute of Architects. Founded in 1857, the American Institute of Architects is the national organization of the architectural profession in the United States. It is composed of upwards of 3,100 individual members, each of whom is a qualified architect. The members are grouped in 71 local chapters and 21 state associations. Through these organizations more than 8,000 architects of the United States are under its aegis. The objects of the organization are: to organize and unite in fellowship the architects of the United States; to combine their efforts so as to promote the aesthetic, scientific and practical efficiency of the profession; to advance education in architecture and in the arts and sciences allied therewith, and to make the profession of ever-increasing service to society. Its principal activities are directed toward the achievement of the above stated objects of the organization. The officers of the institute were in 1941: president, R. H. Shreve, New York; vice-president, Walter R. MacCornack, Boston, Mass.; secretary, Charles T. Ingham, Pittsburgh, Pa.; treasurer, John R. Fugard, Chicago, Ill. Its headquarters were at 1741 New York avenue, N.W., Washington, D.C. (R. H. SE.)

American Iron and Steel Institute. A substantial part of the activities of the American Iron and Steel institute during 1941 related to the steel industry's function in the national defense program. In connection with that program, the institute cooperated with the Office of Production Management, with the war and navy departments and with other government agencies concerned with defense. Important in the institute's defense activities was the compilation of statistical information relative to production, capacity, shipments, etc., from individual companies in the industry and the transmittal of such information to the defense agencies. In addition, numerous committees of metallurgists and other technical people within the industry served on institute committees, dealing with such problems as government specifications for iron and steel products, standardization and similar related technical subjects. Although activities in connection with the defense program were of major importance during 1941, the regular activities of the institute were continued. Among these were the publication and distribution of booklets and the compilation and publication of a series of freight tariffs on iron and steel products, from important origin points to principal destinations. Another important activity was the providing of accurate information concerning the industry to editors, writers and the public generally. Thousands of requests for such information were handled during the year. (W. S. To.)

American Judicature Society. The American Judicature society was incorporated in 1913 under the laws of Illinois to promote the efficient administration of justice. It first issued a series of bulletins surveying the fundamentals of judicial administration, and in 1917 began publication of the bi-monthly *Journal,* in its 25th volume (1941). The society's interest embraces the whole field of judicial administration, civil and criminal, state and federal, and it aids in improvement of bar and court organization, judicial selection and tenure, civil and criminal procedure, and legal education and admission to the bar. It has laid the foundation for virtually every reform accomplished and under way in its field. During its first 12 years it was supported entirely by Charles F. Ruggles, a layman. In 1941 it had 2,600

members, mostly lawyers, law teachers and judges. Membership is open to all, with dues at $5 a year. Subscriptions to the *Journal* are free. The society co-operates closely with the American Bar association and with state and local bar organizations, all of which its *Journal* serves in the field of judicial administration. Officers in 1941 were David A. Simmons, president; John J. Parker, Merrill E. Otis, Homer Cummings, Edward R. Finch and John G. Buchanan, vice-presidents; Thomas F. McDonald, chairman of the board; Herbert Harley, secretary-treasurer; and Glenn R. Winters, assistant secretary-treasurer. Offices are in Hutchins hall, University of Michigan, Ann Arbor, Mich. (H. HAR.)

American Law Institute. Since its organization, the chief work of the American Law institute has been a *Restatement of the Law,* best described as an orderly statement of the present common law. While the sections into which the restatement is divided are written in statutory form, they are not presented to legislatures for adoption. The object of the restatement is to clarify and simplify the common law, but not to prevent its continued development by judicial decision. Prior to 1941, 15 volumes of the restatement were published, including the law of contracts, conflict of laws, agency, trusts, restitution and security, besides large portions of the law of property and torts. During 1941 work on the restatement of the subjects, judgments, security and the fourth volume of the restatement of the law of property went forward. Work on the volume on the restatement of security was concluded and published. The institute was also engaged on two other projects of importance—the drafting of a model code of evidence and statutes dealing with the administration of the criminal law in so far as it affects youths between 16 and 21 convicted of crime. A model statute creating a treatment board to which such convicted youths will be sentenced was adopted at the annual meeting in May 1940 and steps were taken in 1940 and 1941 to secure its consideration by state legislatures. In July 1941 the act was adopted in California. An act creating a model youth court was adopted at the annual meeting in May.

The American Law institute was organized in Feb. 1923. Its object is to carry on constructive scientific work for the improvement of the law. Aside from the official members, who are those holding the leading judicial, bar and law school faculty positions, there are 725 life members; membership being a distinct professional honour. The governing body is a council of 33. The members meet each year in Washington, D.C. All legal and other official publications of the institute must be first approved by the council and by a meeting of members. The president in 1941 was George Wharton Pepper; William Draper Lewis was director and chief of the editorial staff. The executive office is at 3400 Chestnut street, Philadelphia, Pennsylvania. (W. D. L.)

American Legion. In 1941 the American Legion practically went on a complete war basis to throw the full weight of its manpower, prestige and influence into America's all-out national defense effort. All its other activities were co-ordinated with this main program.

During 1941 the Legion registered 900,000 of its members for national defense service; sent a mission at its own expense to Great Britain to study civilian defense functions in modern warfare; published the first handbook in the United States on civilian participation in air-raid warning and air-raid precautionary services; enrolled and trained tens of thousands of observers for air-raid warning posts; organized thousands of air-raid observation posts; established a division of defense at national headquarters; participated in numerous air-raid warning tests

LYNN U. STAMBAUGH waving to delegates of the American Legion convention at Milwaukee after his election as national commander Sept. 18, 1941. Beside him is Milo J. Warner, retiring commander

conducted by the army and received high commendation; sponsored test blackouts in many cities; conducted a recruiting campaign for the navy; pledged itself to promote service as flying cadets for the army and navy; suggested and participated in the aluminum collection campaign; invested post, department and national funds in defense bonds and supported bond-buying campaigns; established blood banks; organized "ham" radio networks for emergency service; entered into a nation-wide physical education campaign; worked with the FBI against spies and saboteurs; extended its free rehabilitation services to all members of the present armed forces; aided in finding employment for discharged conscripts.

There was further expansion of the Legion's youth-training activities, with many thousands of pupils in 46 states participating in a high school oratorical contest; 15,000 selected boys enrolled in 34 Boys' States in which they were taught the mechanics of American self-government; and with 400,000 boys under 17 playing in junior baseball.

The long-range child welfare objective was fixed as the physical fitness of American childhood, and the known total of $6,279,469.67 was expended in emergency financial aid to 629,993 needy children, mostly for food, clothing and medical treatments; a rehabilitation program recovered grants totalling $2,603,747.49 in contested benefits for disabled veterans and their dependents. Membership was at the highest point in the American Legion and its four affiliated organizations.

The 23rd annual national convention was attended by 200,000 members and their families in Milwaukee, Wis., Sept. 15–18, 1941. The convention went on record for repeal of the neutrality act, removal of geographic limitation on the movement of U.S. troops, indorsement of the foreign policy of the president and the congress, upholding the traditional U.S. policy of freedom of the seas, opposition to any appeasement toward the aggressor nations (Germany, Italy and Japan).

The 1,462 official delegates, representing 58 continental and outlying departments and four posts not attached to any department, named Lynn U. Stambaugh, Fargo, N.D., attorney, to succeed Milo J. Warner, Toledo, O., as national commander, and chose New Orleans, La., as the 1942 convention city.

National headquarters of the American Legion, and of its affiliated organizations, the American Legion auxiliary, the Forty

Membership, American Legion and Affiliated Organizations, Dec. 31, 1941

	Membership	Membership increase over 1940	No. of Posts	Increase in Posts over 1940	No. of Units	No. of Squadrons	Increase in Squadrons over 1940	No. of Voitures	No. of Salons
American Legion	1,107,075*	28,950	11,790	75	..	..	..	..	..
American Legion Auxiliary	523,438*	19,020	..	..	9,351	..	..	..	..
Sons of the American Legion	53,892	12,948†	..	..	..	3,508	58	..	..
The Forty and Eight	45,130*	1,545	..	..	..	..	..	750	..
The Eight and Forty	7,776*	518	..	..	..	..	..	..	325

*New high. †Decrease.

and Eight, and the Sons of the American Legion, remained at the War Memorial building, Indianapolis. The Eight and Forty has headquarters elsewhere in Indianapolis. Frank E. Samuel, national adjutant, and principal administrative officer of the American Legion, was re-elected by the national executive committee at its meeting in Milwaukee, immediately following adjournment of the national convention. (L. U. S.)

American Library Association.

This association is the official organization of librarians, library trustees and others interested in libraries. While most members are from the United States and Canada, all continents are represented in the membership of 16,000. The association was founded in 1876, and is the oldest and largest organization of its kind in the world. Headquarters are at 520 North Michigan avenue, Chicago. Charles H. Brown, Ames, Ia., was president for 1941–42, and Carl H. Milam was executive secretary.

The development of library service in the United States and Canada is the major objective of the association. Most recent figures reveal there are 47,000,000 people without public libraries in the two countries. The headquarters staff and many volunteer committees work to raise standards of library service, to maintain standards of professional training, to improve the status of the profession, and integrate its interests with those of the federal and local governments.

Committees contribute important service in book buying, analysis of reading interests, federal and international relations, library administration, microphotography, work with the blind and foreign-born. Of special significance during 1941 were the policies and programs for action, planned to adjust library service for maximum efficiency under defense and wartime conditions.

A policy statement, "Libraries and the War," was adopted at the annual midwinter conference, Dec. 28–31, 1941, and outlined the American public library's wartime program. Libraries will act as war information centres; sources of research material and books on technical and industrial skills; disseminators of authentic information about ideas and interpretations of events of vital importance to the civilian in World War II. Libraries also looked forward to a postwar "world order of decency, security and human dignity," in which the American people would make wise decisions based on knowledge the public library can supply.

In a statement to the press in Jan. 1942, Mrs. Eleanor Roosevelt, assistant director of the Office of Civilian Defense, endorsed the service of libraries as war information centres, and announced official participation by the Office of Civilian Defense along lines recommended by the American Library association.

More than 4,000 librarians and friends of libraries attended the 63rd annual conference in Boston, Mass., June 19–25, 1941. The theme of the conference was "Deeds, Not Words." Much time was devoted to the necessity of adjusting libraries to an enormous industrial expansion, a problem not then overshadowed by the library's wartime responsibilities for civilian information.

Awards.—The Newbery award for the best contribution to children's literature during 1940 was conferred on Armstrong Sperry's *Call It Courage*. Robert Lawson received the Caldecott medal for *They Were Strong and Good*, judged the most distinguished picture book for children published in the United States during 1940. Anne Eaton won the James Terry White award for her book *Reading With Children*. For the first time, two library trustees were officially cited by the association for their service to American libraries. They were Rush Burton of Lavonia, Ga., and William E. Marcus of Montclair, N.J.

National Book Drive.—During the conference preliminary action was taken on plans for a national book drive for soldiers and sailors, sponsored by the American Library association, United Service Organizations and the American Red Cross. Althea Warren, librarian of the Los Angeles public library, was named as national director. The campaign opened Jan. 12, 1942.

Publications.—More than 150 publishing projects were in various stages of completion during 1941. Of the total, 29 were published. Funds from the Carnegie corporation made possible the publication of 14 bibliographies and two surveys concerned with industrial and technical training for defense, the preservation of democracy and international understanding. Among books published during the year were *Introducción a la Práctica Bibliotecaria en los Estados Unidos* by Carnovsky; *Teacher-Librarian's Handbook* by Douglas; *Subject Index to Poetry* by Bruncken; a preliminary American second edition of *A.L.A. Catalog Rules* and *Administering Library Service in the Elementary School* by Gardiner and Baisden.

In addition to books, bibliographies, indexes and pamphlets the association publishes the *A.L.A. Bulletin*, a monthly which includes the annual reports; the *Booklist*, a semimonthly guide to the selection and purchase of current books; the *Subscription Books Bulletin*, a quarterly presenting critical estimates of subscription books and sets sold by canvassing agents; the *Journal of Documentary Reproduction*, a quarterly; *College and Research Libraries*, a quarterly published by the Association of College and Reference Libraries, a division of the A.L.A., and the *Hospital Book Guide*, a quarterly which evaluates books from the point of view of the invalid and convalescent.

Finances.—The association's endowment was in 1941 approximately $2,152,000. The income of the organization in 1940–41 (excluding cash balances of $45,160 on Sept. 1, 1940) was $369,240. About $194,220 was derived from membership dues, conference income, sales of publications, advertising, subscriptions, etc., and was used primarily for membership and publishing activities; $98,900 came from outside sources in the form of grants for specific purposes.

These grants supported such activities as relations with Latin-American libraries; provision of books for public libraries in Europe; purchase and storage of research material for the rehabilitation of scholarly European libraries after the war; publication of book lists; the national defense program. (O. M. PN.)

American Literature.

The course of American literature in 1941 did not differ markedly from the general directions of the year before, but tendencies already observable were strengthened by the flow of events. For example, the trickle of books on South America grew to a river, while increasing tension in the far east gave rise to the publication of a number of volumes discussing the position of the United States and Japan, and interest in the U.S. past continued unabated in fiction as well as nonfiction. In fact, the only strong trend in the novel continued to be toward the historical, although there were also a number of works of regional nature, and in several excellent series various rivers, cities and parts of the country found their students and historians.

The popularity of John Gunther's *Inside Latin America,* one of the most widely read books, might have been at least partly attributable to its author's reputation as a continental reporter, but it is safe to assume that the timeliness of the subject matter had much to do with its success. The latter quality, coupled with an excellent journalistic style, also played a large part in the reading of William L. Shirer's *Berlin Diary: The Journal of a Foreign Correspondent, 1934–1941,* the most popular of a number of similar publications. Of books concerned with U.S. history, Margaret Leech's *Reveille in Washington,* a detailed account of life in the nation's capital during the period of the American Civil War, won thousands of shocked and fascinated readers, and was also a landmark in the progress of social history, written with emphasis upon the details of daily living, rather than upon battles and politics. Of somewhat the same general nature was Carl Van Doren's *The Secret History of the American Revolution,* subtitled *An Account of the Conspiracies of Benedict Arnold and Others,* and based upon a study of important documents hitherto unexamined, a more scholarly and less popular work than that of Miss Leech, but one of first importance.

The increasing significance of Pres. Roosevelt's position in world affairs added interest to two books about the presidency, Matthew Josephson's *The President-Makers: The Culture of Politics and Leadership in an Age of Enlightenment, 1896–1919,* and Edward S. Corwin's *The President: Office and Powers,* with the subtitle *A History of Analysis and Opinion,* a thorough study. The president continued his own account of his stewardship in the second four-volume set of *The Public Papers and Addresses of Franklin D. Roosevelt,* presented with a special introduction and explanatory notes, and covering the years between 1937 and 1940, with the following separate titles: *1937: The Constitution Prevails; 1938: The Continuing Struggle for Liberalism; 1939: War—And Neutrality; 1940: War—And Aid to the Democracies.*

Another of the important publications of the year was *The Dictionary of American History* in five volumes, edited by James Truslow Adams, with R. V. Coleman as managing editor. It was designed to be a companion set to the famous *Dictionary of American Biography.*

In fiction, an average number of fresh new talents made their appearance, while older novelists contributed books up to their accustomed standards, although the year was without a startling novel, either from the point of view of exceptional popular success or artistic merit. A new short story writer of distinction, Eudora Welty, published her first collection, *A Curtain of Green,* with an introduction by Katharine Anne Porter, and also won second prize in the O. Henry Memorial competition.

Worthy of mention in poetry was the appearance of a number of long poems of merit, more or less evenly divided among poets of established reputation and younger people. Among these were William Rose Benét's autobiography in verse, often of high quality, *The Dust Which Was God,* Mark Van Doren's novel of pioneer days, *The Mayfield Deer,* John Gould Fletcher's story of Arkansas, *South Star,* Harry Brown's *The Poem of Bunker Hill* and Delmore Schwartz's *Shenandoah,* the title being taken from the name of the protagonist, a Jew born in the Bronx. Universal interest in aviation was evidenced by the popularity of Selden Rodman's excellent anthology of poems about flying, *The Poetry of Flight.* An important body of the work of Horace Gregory was represented in *Poems: 1930–1940,* and a complete collection of the verse of Ridgely Torrence in *Poems by Ridgely Torrence,* while all Edna St. Vincent Millay's sonnets were gathered into one volume called *The Collected Sonnets of Edna St. Vincent Millay.*

The Novel.—Of older writers of fiction, John P. Marquand continued his ironical and penetrating analysis of the New England scene and character with *H. M. Pulham, Esq.,* a novel about a Bostonian-cum-Harvard who longed for the fleshpots of Manhattan, but had to be content with the baked beans of his native city, while Ellen Glasgow produced another of her serious stories called *In This Our Life,* marked by her usual grasp of the fundamentals of the struggle for spiritual survival. The year saw the loss to American letters by death of Elizabeth Madox Roberts, whose last novel, *Not by Strange Gods,* gave further evidence of her unusual talent, although it did not reach the heights of her masterpiece, *The Time of Man,* and of F. Scott Fitzgerald, who left behind the unfinished manuscript of a novel, *The Last Tycoon.* Concerned with the career of a Hollywood magnate, it was published as a fragment along with *The Great Gatsby* and some selected stories, and served to emphasize the impressive and only partly realized possibilities of its author. The last of Thomas Wolfe's literary remains, a collection of fragments and stories called *The Hills Beyond,* seemed unlikely to bring about any change in the author's reputation.

JOHN P. MARQUAND published another best-seller about Boston, *H. M. Pulham, Esquire,* in 1941. He is pictured in his home in New York city, under Grant Wood's "Parson Weems' Fable"

Booth Tarkington, the most productive of the older writers of fiction, was represented by two titles, *The Heritage of Hatcher Ide,* a story of American youth in the depression, and *The Fighting Littles,* less important, but amusing. Robert Nathan also produced two of his exquisite short novels, *They Went on Together* and *Tapiola's Brave Regiment,* both allegories for these times. Ben Ames Williams, one of the most prolific writers of fiction in the whole history of American letters, was represented by *The Strange Woman,* perhaps his finest and most ambitious work, while Mary Ellen Chase's *Windswept,* another panel in her Maine series, was generally regarded as her best work. Edna Ferber's *Saratoga Trunk* was reliable Ferber, full of colour and action, and headed, like Louis Bromfield's story of old New Orleans, *Wild Is the River,* straight for Hollywood, with very few changes. Evelyn Scott's uneven and still distinguished talent was in evidence in *The Shadow of the Hawk,* and Josephine Herbst's *Satan's Sergeants* disclosed a pleasantly lighter side to the work of a novelist who has often seemed to suffer from an excess of social consciousness. Upton Sinclair's *Between Two Worlds* continued the story of our times begun in *World's End* in a readable fashion.

Of a round hundred novels that represented 1941's serious contribution to the annals of American literature, some 30 were historical, covering many parts of the U.S. and many periods of time. Carl Carmer, hitherto known as a poet and social historian, made his debut in this field with *Genesee Fever,* a well done story of post-revolutionary days in the part of the country which the author knows thoroughly, while Frank O. Hough continued his account of war in Westchester county with *The Neutral Ground.* Other novels of the early days of the republic included Tom Pridgen's *Tory Oath,* with the Scottish Cape Fear country as its background; *Captain Paul* by Commander Edward Ellsberg, a stirring fictionization of the career of John Paul Jones; *One Red Rose Forever* by Mildred Jordan, based on the life of William, called Baron, Stiegel, the famous glassmaker; *Waters of the Wilderness* by Shirley Seifert, a stirring romance with George Rogers Clark as the hero; *Green Centuries* by Caroline Gordon, a novel of early days in Kentucky; *Not Without Peril* by Marguerite Allis, the story of Jemima Sartwell, Indian captive, and the upper Connecticut valley from 1742 to 1805; and *Richard Pryne* by Cyril Harris, a super-spy story of Long Island and New York in the days of the Revolutionary War.

Two relatively unknown fiction writers swept to the front during 1941 with unusual books. One of them was Marcus Goodrich, whose *Delilah* was the tale of an over-age destroyer, with the Philippines as the background, which won universal praise from the reviewers for its originality, while the other was Budd Schulberg, whose *What Makes Sammy Run?* was a stinging portrait of a Hollywood producer. Other younger writers whose work brightened the literary horizon included George Stewart, whose *Storm,* coming at the end of the year, promised to carry over well into 1942 and perhaps to start a new literary genre as well; Josephine Pinckney, hitherto known as a poet, whose *Hilton Head* was an excellent historical novel of her own South Carolina; Maritta M. Wolf, whose *Whistle Stop* was a moving study of everyday people in a middle western community; Paul Engle, whose *Always the Land* marked the entrance into the fiction ranks of a good young poet; Mary King's *Quincie Bolliver,* the story of a girl in an oil town which had striking life and gusto—the oil town boom also found treatment in Edwin Lanham's *Thunder in the Earth*—and Robert Paul Smith, whose *So It Doesn't Whistle* was a shrewd and entertaining story of life in contemporary New York.

Short Stories.—The death of Edward J. O'Brien after 27 years of editorship of *The Best American Short Stories* marked the end of the work of a man whose taste for a certain type of short story had had marked effect upon a whole generation. The 1941 volume was completed by Martha Foley, of *Story* magazine, who will continue the anthology. Harry Hansen surrendered the editorship of the O. Henry Memorial Prize Short Stories to Herschel Brickell, whose first volume, the 23rd in the series, contained 20 stories, the prize winners being Kay Boyle's "Defeat," Eudora Welty's "A Worn Path," Hallie Southgate Abbett's "Eighteenth Summer" and Andy Logan's "The Visit."

Biography.—The important biographies of the year fell into two main groups, studies of famous families of great wealth, and of noted military and political leaders, principally of the revolutionary period. Among the first, the notable examples are Wayne Andrews's *The Vanderbilt Legend: 1794–1940,* a detailed account of this famous family and all its members; Harvey O'Connor's *The Astors,* which performs a like service for another clan of plutocrats; and *Alfred I. du Pont: The Family Rebel* by Marquis James, a full-length and colourful portrait of the most unusual member of the du Ponts of Delaware. In the second classification were *The Admirable Trumpeter: A Biography of General James A. Wilkinson,* by Thomas Robson Hay and M. R. Werner, a fine biography of one of the most complex and fascinating rascals in U.S. history; *Horatio Gates: Defender of American Liberties* by Samuel White Patterson, a strongly biased but important book about a neglected leader; *James Madison: The Virginia Revolutionary* by Irving Brant, an excellent full-length portrait of one of the most important of the founding fathers; and *Anthony Wayne* by Harry Emerson Wildes, an attempt to do justice to Mad Anthony, by a competent and scholarly biographer. Two naval commanders were given handsome treatment in Hulbert Footner's *Sailor of Fortune: The Life and Adventures of Commander Barney, U.S.N.,* and in Charles Lee Lewis's *David Glasgow Farragut: Admiral in the Making,* while a Civil War hero who was also found in the Spanish-American War was presented in full detail by John P. Dyer in *Fightin' Joe Wheeler.*

Other notable biographies of the year included Blanche Colton Williams's sympathetic and engaging life of Clara Barton, subtitled *Daughter of Destiny;* Garrett Mattingly's *Catherine of Aragon,* a triumph of American scholarship, since it was regarded as the best study yet made of Henry VIII's Spanish queen; *William Henry Welch and the Heroic Age of American Medicine* by Simon Flexner and James Thomas Flexner; *The Doctors Mayo* by Helen Clapsaddle, the full account of the careers of the magicians of Rochester, Minn.; *Mr. Dooley's America: A Life of Finley Peter Dunne* by Elmer Ellis, an excellent portrait of the creator of one of the best known of imaginary Americans and Irving Stone's *Clarence Darrow for the Defense.*

Rivers and Regions.—Books of a regional character have been published in ever-increasing numbers and 1941 had its full share. Additions to the excellent Rivers of America series, which was started under the editorship of the late Constance Lindsay Skinner and which was being carried on under the guidance of Stephen Vincent Benét, include *The Kaw: The Heart of a Nation* by Floyd Benjamin Streeter; *The Brandywine* by Henry Seidel Canby; and *The Charles* by Arthur Bernon Tourtellot. Other books about rivers, not in the series, included *Great River of the Mountains: The Hudson,* with photographs and text by Croswell Bowen, and an introduction by Carl Carmer, and *Flowing South* by Clark B. Firestone, more about the Mississippi. A fine new collection, called the American Folkway series, under the editorship of Erskine Caldwell, got under way with three excellent volumes, *Desert Country* by Edwin Corle, *Piñon Country* by Haniel Long and *Short Grass Country* by Stanley Vestal. Additions to the Ports of America series were *Northwest Gateway: The Story of the Port of Seattle* by Archie Binns, and *Baltimore on the Chesapeake* by Hamilton Owens.

Other important books in this field included Joseph Henry

Jackson's rousing history of early California, *Anybody's Gold: The Story of California's Mining Towns;* Dorothy Gardner's *West of the River,* the story of the Missouri country from the arrival of the first explorers to the coming of the first railway; J. Frank Dobie's *The Longhorns,* an account of the great days of range cattle raising in the west; Jeremiah Digges's *In Great Waters,* a book about the Portuguese fishermen of New England; *Shenandoah and Its Byways* by William O. Stevens; and *The Farthest Reach* by Nancy Wilson Ross, a book about Washington and Oregon. Vermont and North Carolina, mountain states north and south, inspire people to write books about them in quantities, and the latest crop included *The Reluctant Republic: A History of Vermont* by Frederick F. Van der Water; *Winter in Vermont* by Charles A. Crane, with many beautiful photographs taken by the author, and *The Covered Bridge* by Herbert Wheaton Congdon, with photographs by Edmund Homer Royce. Archibald Henderson wrote a two-volume history of his native North Carolina, *The Old North State and the New,* and Jonathan Daniels produced an impressionistic study in *The Tar Heels: A Portrait,* an addition to a new series of biographies of the 48 states. Oliver Carlson tried, with some success, to put all of California into *A Mirror for Californians,* and other books in this classification ranged from *Williamsburg: Old and New* by Hildegarde Hawthorne, the last volume illustrated by E. H. Suydam before his death, to *Sodom by the Sea: An Affectionate History of Coney Island,* by Oliver Pilat and Jo Rawson.

South America.—In addition to John Gunther's *Inside Latin America,* which found considerably less favour among South Americans than among Gunther's fellow countrymen, a number of good books on the neighbouring continent, its peoples and its problems, appeared during the year. Of those covering large areas with thoroughness were W. L. Schurz's *Latin America,* a sound and carefully accurate study, made by a veteran observer; Hubert Herring's *Good Neighbors,* which devoted most of its attention to the ABC powers, Argentina, Brazil and Chile, but which also covered the 17 remaining republics, and which was the result of long and patient study; *The Other America* by Lawrence Griswold, covering ten South American republics, with Panama and the Guianas thrown in, and written by a distinguished archaeologist and geographer; *A Pageant of South American History* by Anne Merriman Peck, covering the whole story from pre-Columbian days to 1941, and an indispensable book on the subject; Charles Morrow Wilson's *Central America: Challenge and Opportunity,* which adds Colombia, Jamaica and Cuba to its nations of middle America, and Carl Crow's *Meet the South Americans,* interesting reading, but much more superficial than any of the other volumes mentioned.

The question of hemisphere defense was also treated in several valuable books, such as Charles Wertenbaker's *A New Doctrine of the Americas,* which contains many sketches of the personalities helping to put the new doctrine into action, and which also discusses military and economic matters; *Strategy of the Americas* by Cushman Reynolds and Fleming MacLeish, explaining the paths of possible attack and indicating defense resources; *Hands Off!* by Dexter Perkins, a complete history of the Monroe Doctrine; and *United We Stand: Defense of the Western Hemisphere* by Hanson W. Baldwin, the noted military and naval expert.

Far East.—The surprise attack of the Japanese on Pearl Harbor might have been avoided if the numerous books on the far eastern situation had been read by the commanders of the American forces. Most surprisingly prophetic of these was *Hawaii, Restless Rampart,* by Joseph Barber, Jr., which revealed fully the activities of the Japanese fifth column. Florence Horn's book on the Philippines, *Orphans of the Pacific,* was equally wise in its predictions, while many other books revealed the attitude of Japan toward the United States. Among them were the work of the veteran newspaper correspondent, Hallett Abend, called *Japan Unmasked;* Wilfred Fleisher's equally well informed *Volcanic Isle;* Claude A. Buss's scholarly *War and Diplomacy in Eastern Asia;* and William C. Johnstone's *The United States and Japan's New Order.* A full discussion of the war strength of the two nations was set forth in *The Armed Forces of the Pacific: The Military and Naval Power of the United States and Japan* by Capt. W. D. Puleston, U.S.N., retired, somewhat optimistic in tone from the American point of view. Mark J. Gayn's *Fight for the Pacific* was much more pessimistic and therefore closer to the mark. Both are valuable sources of information. Other important books on the far east included Edgar Snow's *The Battle for Asia,* a history of the Sino-Japanese War by one of the most noted correspondents in the orient; Joy Homer's *Dawn Watch in China,* a young writer's account of Chinese youth in wartime; and Emily Hahn's *The Soong Sisters,* a lively biography of China's three outstanding women, the wives of Chiang Kai-shek and H. H. Kung, and the widow of Sun Yat-sen.

Belles Lettres.—The year produced at least one literary study of first magnitude in F. C. Matthiesen's *American Renaissance: The Art of Expression in the Age of Emerson and Whitman,* a long and profound discussion not only of the two giants mentioned in the title, but also of Melville, Thoreau and Hawthorne. Edmund Wilson's *The Wound and the Bow* consisted of seven studies in literature, ranging from Dickens to Hemingway, and was done with this critic's usual perspicuity. *The Opinions of Oliver Allston* by Van Wyck Brooks, set forth in an unconventional autobiography Brooks's thoughts on life and letters, and was a positive declaration of faith, which called upon writers to help make a better future. Literary biographies of note included *That Rascal Freneau: A Study in Literary Failure* by Lewis Leary, a book about the first U.S. poet; *American Giant: Walt Whitman and His Times* by Frances Winwar; and *Crusader in Crinoline* by Forrest Wilson, a life of Harriet Beecher Stowe.

Autobiography.—Among autobiographies of literary men, William Alexander Percy's *Lanterns on the Levee* was widely popular because it not only showed that a distinguished poet could write distinguished prose, but it revealed also a whole attitude toward life, that of a wellborn southerner, and it was a very plum pudding of anecdote. Ray Stannard Baker's *Native American: The Book of My Youth,* a kind of double autobiography, since Baker and his nom de plume, David Grayson, have led separate careers, was valuable not only as history, but as a setting forth of the American way of life. In *Young Man of Caracas* T. R. Ybarra, the well known journalist, wrote a charming account of his family, truly Pan-American, since his father came from Venezuela and his mother from Boston. Margaret Deland's *Golden Yesterdays,* memories of Pennsylvania and New England, had a delightfully reminiscent quality, and the second volume of Josephus Daniels' long autobiography, *Editor in Politics,* was filled with good reading, as was Irvin Cobb's *Exit Laughing* and Rex Beach's *Personal Exposures.*

Miscellaneous.—The most notable volume of letters of the year was *The Holmes-Pollock Letters: The Correspondence of Mr. Justice Holmes and Sir Frederick Pollock, 1874–1932,* which was edited by M. A. De Wolfe Howe and which had an introduction by John Gorham Palfrey, the civilized correspondence of two great men. (*See* also ENGLISH LITERATURE.) (H. BL.)

American Medical Association. The American Medical association includes more than 121,000 physicians. It is a democratic organization, with representation in a house of delegates to which

is elected yearly, on the basis of the number of physicians from each state, a given number of delegates. Its purpose is to guard and promote medicine in all of its branches. It maintains a department quite similar to the bureau of standards in Washington, D.C., in which are critically investigated and passed or rejected, drugs, medical apparatus, food and all types of materials which relate to medicine. It ascertains in these materials which are advertised whether or not they are what they purport to be in their advertisements, and if they are not, their advertisements are not accepted in any reputable medical journal. It maintains a council on medical education and hospitals, with investigators who are constantly critically observing medical schools to be certain that they are maintaining the standards which are required for grade A rating in medical schools. It publishes the *Journal of the American Medical Association* weekly, which has the largest circulation of any medical journal in the world. It also publishes 12 special journals such as the *Archives of Surgery, Archives of Internal Medicine,* etc. The officers of the association for 1941–42 were: president, Frank H. Lahey; president-elect, Fred W. Rankin; vice-president, Charles A. Dukes; secretary and general manager, Olin West.

The American Medical association supports an annual meeting with lectures of general interest, given by recognized authorities, for the first two days, and sectional meetings of special interest, including one for general practitioners, for the last three days of the meeting. Before these sections are read papers having to do with the new developments in medicine. At the same meeting it organizes and presents a scientific exhibit in which everything that is new in medicine is presented in exhibits, with outlines, charts, figures, moulages, X-rays, statistical data, and with the exhibitors present who are familiar with all of their details, to discuss and demonstrate them to those who desire to learn from them.

The American Medical association sent questionnaires to more than 180,000 physicians and tabulated under the punch card system more than 160,000 physicians as to their availability for military service. Doctors in various specialties were tabulated as to their specialty, but also rated as to their qualifications.

At the meeting of the American Medical association in Cleveland, a motion was passed by the house of delegates and forwarded to the president of the United States, the secretary of war, the secretary of the navy and the surgeons general of the army, navy and public health, advising the establishment of an agency for the procurement and assignment of medical personnel for the various departments of the government related to war. This agency, appointed by the president, was functioning in 1941 and was ready to supply medical men for the armed forces, selected through corps area, state and county committees, having in mind that no area is to be depleted and that the names be selected in terms of age, training and requirements of the armed forces.

The headquarters of the American Medical association in Chicago employs 630 persons who conduct its many bureaus and produce its publications. (F. H. L.)

American National Red Cross: *see* RED CROSS.
American Samoa: *see* SAMOA, AMERICAN.
American Youth Congress: *see* YOUTH MOVEMENTS.

Anaemia. Renewed attention was directed to the haemolytic anaemias (due to blood destruction). In 1941, studies were reported on march haemoglobinaemia, favism, paroxysmal nocturnal haemoglobinuria, Baghdad spring anaemia, bush-tea haematuria, and haemolytic reactions to transfusions from anti-Rh haemolysins, or from isoimmunization of group A_2 individuals against group A_1 blood. Haemolytic lysolecithin develops in stagnant blood. In the acute haemolytic anaemia following sulphanilamide or sulphapyridine poisoning, 30% of circulating blood corpuscles may be dissolved in 12 to 48 hours, resulting in shock. Haemoglobin is released from the cells and methaemoglobin and methaemalbumin are produced. Erythrocytes in the blood of patients with familial acholuric jaundice undergo autohaemolysis (self-blood destruction) more rapidly than normal red blood cells, in vitro, at 37°.

Red blood cell survival after storage up to 18 days is but little inferior to fresh blood when transfused into patients with anaemia and the cells may be detected in the circulation for from 70 to 90 days. Symptomatic haemolytic anaemia, secondary to dermoid cysts, chronic lymphatic leukaemia, Hodgkin's disease, lymphosarcoma, severe liver disease or pneumonia can be relieved only with the improvement of the underlying condition. The haemoglobinuria in blackwater fever appears to be due to the action of the abnormal amount of bile salts, released from the affected liver, on the red blood cells injured (decreased lytic resistance) by the malarial infection. Extensive studies on the technical aspects of blood preservation (bank blood) for transfusion in anaemia were reported. Blood transfusions may be given directly into the bone marrow. Among blood substitutes for restoring blood volume are pectin and isinglass. Transfusions of concentrated saline suspensions of red blood cells are effective in treating anaemia. "Universal blood" (group O) may be made safe for transfusion by the addition of group specific substances A and B. Combined universal blood (group O cells and group AB plasma) may be given to patients of any group without previous testing or subsequent reactions. However, danger is not present in giving blood from a universal donor directly to patients, regardless of the donor's serum agglutinins. The regeneration of blood in transfusion donors is eight times more rapid when iron is given than when medication is not given. After the loss of 500 c.c. of blood, the return to normal, with iron therapy, requires 11 days.

Anti-Rh factor in a mother has been reported as a cause of erythroblastosis foetalis in infants who are Rh-positive. Deprivation of placental blood in the newborn results in a lowering of the red blood cell count and a decrease in the haemoglobin content of the blood. Lysine is an essential amino acid in haemoglobin regeneration. Casein digests parenterally have been used to form blood plasma protein. The stimulus to haemoglobin formation is greater when anaemia is more severe and regeneration is proportional to the degree of anaemia. Haemoglobin regeneration in anaemic trout is more rapid after the feeding of fly maggots, than after liver. Primary deficiency macrocytosis appears in persons with deficient nourishment. A familial microcytic anaemia, refractory to treatment, was described in an Italian family.

Deficiency in natural prothrombin with prolonged bleeding time, as well as idiopathic hypoprothrombinaemia, have been found to be causes of haemorrhagic disease. Haemorrhagic anaemia of the newborn is prevented by the intravenous injection of 4-amino-2 methyl-1 naphthol hydrochloride (vitamin K) into the mother before delivery. Vitamin B has been recommended for the treatment of residual neurologic complications in pernicious anaemia. In mild hypochromic anaemia in the adult, the addition of 3 mg. of copper sulphate to iron and ammonium citrate does not increase the effectiveness of iron in haemoglobin regeneration. Arrest of haemorrhage is produced by contraction of blood vessels (capillaries) for from 20 to 120 min., during which time a clot forms and seals the opening. (R. Is.)

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Anaesthesia. In Feb. 1941 the American Board of Anesthesiology, Inc., became a major independent board whereas previously it had been an affiliate of the American Board of Surgery. The officers were: president, Ralph M. Waters, Madison, Wis.; vice-president, Henry S. Ruth, Philadelphia, Pa.; secretary, Paul M. Wood, New York city.

In June 1941 the section on anaesthesiology of the American Medical association met for the first time at the annual meeting of the American Medical association in Cleveland, O. The chairman was Ralph M. Waters, Madison, Wis.; vice-chairman, Thomas J. Collier, Atlanta, Ga.; secretary, John S. Lundy, Rochester, Minn.

In 1941 the National Research council set up medical and surgical advisory boards. One of the subcommittees to the committee on surgery was the subcommittee on anaesthesia. The officers were: chairman, Ralph M. Waters, Madison, Wis.; secretary, E. A. Rovenstine, New York city. The members were: Lewis S. Booth, New York city; Ralph M. Tovell, Hartford, Conn.; and John S. Lundy, Rochester, Minn. This subcommittee made recommendations concerning anaesthesiology problems to the surgeons general of the army, navy and public health. They prepared a manual entitled "Fundamentals of Anesthesia" for the use of officers and others employing anaesthetic agents or supervising administration of them. This manual was published by the American Medical association. Thus the specialty of anaesthesiology was finally and for the first time formally established on a basis of a relative equality with other specialties.

"Recommended Safe Practice for the Use of Combustible Anesthetics in Hospital Operating Rooms," was an outline developed by the conference committee on operating room hazards. Their recommendations tended to renew confidence in cyclopropane and other inflammable anaesthetic agents in institutions in the United States where an attempt had been made to avoid the use of these agents, although because of their great value their loss was keenly felt.

The contribution of Lemmon of the method of continuous spinal anaesthesia was used in a greater number of cases. Reports of a number of variations in the technique of its use appeared. This is an outstanding development in anaesthesia and each year should see it gain in favour.

Use of intravenous anaesthesia continued to increase, and a new agent was being investigated in 1941 which, it is hoped, will be an improvement on evipal soluble (n-methyl-C-C-cyclohexamyl-methyl barbituric acid) and pentothal sodium (sodium ethyl [1-methylbutyl] thiobarbiturate). Indications for, and contraindications to, its use have not been established definitely. It is of the greatest value when it is combined with other agents and methods and when the dose of it that is used is not larger than from 1 gm. to 2 gm. The administration of oxygen or the mixture of half oxygen and half nitrous oxide considerably increased the usefulness of the method.

The activity of anaesthetists in connection with aspiration of material from the tracheobronchial tree during and after operation was greatly stimulated by reports of excellent results obtained when this procedure is available and is used early. Not only is it of value as a prophylactic measure, but it is of definite therapeutic value in the treatment of atelectasis.

Investigations were concerned chiefly with new anaesthetic agents, especially for intravenous use. An attempt was being made to explain why certain agents should be avoided in the presence of shock, not only in civilian practice but in military practice. (*See* also SURGERY.) (J. S. L.)

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Anderson, Sherwood (1876–1941), U.S. author, was born Sept. 13 in Camden, Ohio. He was the third child in a family of eight and his father was a struggling harness maker. Young Anderson showed little interest in school; at 14 his schooling stopped and at 17 he became an itinerant housepainter. He wandered through the bustling midwestern states, keenly alive to the growth of industrialization in the '90s. In 1898 he joined the army, saw service in Cuba during the Spanish-American War and returned to Ohio a hero. He became manager of a paint factory, but, dissatisfied with office routine, he quit suddenly and went to Chicago where he worked in an advertising agency. There he met, through his brother Karl, a magazine artist, Chicago's literary titans—Dreiser, Sandburg and Hecht. Under their influence he wrote his first novel, *Windy McPherson's Son*, published in 1916. In 1919 he wrote *Winesburg, Ohio*, a collection of short stories about small-town life, regarded as his best and most lasting work. Later he bought a small-town weekly in Virginia and edited this paper for a while before turning it over to his son. Among his publications are *Tar* (1927); *Hello Towns* (1929); *Perhaps Women* (1931); *Beyond Desire* (1933); *Death in the Woods* (1933); *No Swank* (1934); *Puzzled America* (1935); *Kit Brandon* (1936), and *Plays* (1937). He died March 8 in Colon, Panama; he had been touring South America with his wife. (See *Encyclopædia Britannica.*)

Andrews, Frank Maxwell (1884–), U.S. army officer, was born Feb. 3 in Nashville, Tenn. He was graduated from West Point, 1906, became a cavalry lieutenant and was promoted through the grades to colonel in 1935. Gen. Andrews saw service in the Philippines, 1906–07, and in Hawaii, 1911–13. He was a major with the signal corps during World War I and served with the U.S. army of occupation in Germany, 1920–23. Upon his return to the U.S. he became executive officer of Kelly field, 1923–25, and was a member of the war department general staff, 1934–35. He was appointed temporary major general of the air corps in 1935 and major general commanding G.H.Q. air force, 1936–39. While in the latter post, Andrews piloted an army air corps amphibian

bomber 1,425 mi. from San Juan, Puerto Rico, to Langley field, Va., setting a new world's distance and straight-line record for amphibian planes. In 1939 he was named assistant chief of staff for all army air operations and training. In Sept. 1941 he was promoted to the rank of lieutenant general and head of the Caribbean defense command and the Panama canal department.

Angling. Women anglers in 1941 established four new marks in competition strictly for their sex. But it fell to men to contribute the year's two outstanding catches.

The most notable of these was a 737-lb. blue marlin, taken July 16 by J. Victor Martin at Bimini, British West Indies. This huge fish, caught on 39-thread line, established a new all-tackle record for the species. It was 13 feet 1 inch in length.

The second all-tackle world's record was set in the channel bass division by Captain B. R. Ballance, off Cape Hatteras, North Carolina, on Nov. 29. His catch tipped the scales at 75 lb. 8 oz., breaking a record that had existed for 12 years.

The outstanding women's catch was made by Mrs. Maurice Meyer, Jr., at Bailey's Island, Maine, Aug. 3, when she landed an 818-lb. tuna in 3½ hours to establish a new women's all-tackle record for this species. Second largest catch fell to Mrs. Sarah Farrington—a 659-lb. broadbill swordfish caught June 12 off Tocapilla, Chile. This new women's all-tackle record for the species also constituted an all-time record for 24-thread line.

Other women's all-tackle records established during 1941 were a wahoo of 110 lb., taken April 1 at Walker Cay, British West Indies, by Mrs. B. Davis Crowninshield on 39-thread line in eight minutes' time, and a dolphin of 58 lb. caught May 10 off Morro Castle, Havana, Cuba, by Mrs. James Simpson, Jr. This fish was caught on 9-thread line.

THE BOATS OF 800 FISHERMEN dotted Puget sound, Wash. at dawn on Sept. 7, 1941 as the annual Ben Paris salmon derby got under way. The prize catch of the day weighed 28 lb. 5 ounces

There were no new world's records established by fresh-water anglers. On the basis of all information available, the largest inland-water fish taken during the year was a muskalonge of 56 lb. 8 oz., caught by Robert D. Shawvan at Lake-of-the-Woods, Ontario. It fell short of the world's record established in 1940 by Percy P. Haver by a full six pounds. (B. Bh.)

Anglo-Egyptian Sudan. A territory under the joint sovereignty of Great Britain and Egypt in northeastern Africa, south of Egypt. Area 967,500 sq. mi.; pop. (est. Jan. 1, 1941) 6,362,852. Chief towns: (pop. Jan. 1, 1941) Khartoum, incl. Khartoum North (61,641); Omdurman (117,041); Port Sudan (26,255); Atbara (19,757); El Obeid (33,328). Governor-general: Lt.-Gen. Sir Hubert Huddleston; languages: English and Arabic; religion: Mohammedan.

History.—The security of the Sudan, which in view of its long common frontier with Eritrea and Abyssinia had been seriously threatened by the entry of Italy into the war, showed signs of rapid improvement at the beginning of 1941. The Italians had already been forced to leave Gallabat, and on Jan. 20 the Sudan government was able to reoccupy the important frontier town of Kassala. Meanwhile revolt was spreading in Abyssinia and by the end of January the Emperor Haile Selassie had moved into Abyssinia to put himself at the head of his own people. The Italians evacuated Kassala without offering serious resistance and retired to the mountains round Cheren after Agordat and Barentu had been taken early in February. Kurmuk, the last post on Sudan soil remaining in the hands of the Italians, was reoccupied Feb. 20. The Italian positions round Cheren were strong and were stubbornly defended; and it was not until March 27 that this city was taken after severe fighting. Asmara was not defended, and with the occupation of Addis Ababa on April 5 and the surrender at Amba-Alagi on May 20 the campaign so far as the Sudan was concerned was virtually at an end. There remained an Italian force at Gondar which was left undisturbed during the rainy season but which was compelled to surrender on Nov. 27. The fear of invasion and destructive air raids on Khartoum was thus removed. Throughout the campaign the Sudan defense force, consisting of Sudan native troops, performed its part in a manner which reflected credit on its members and its leadership. The strain on the resources of the Sudan, particularly the railways, caused by the movement and maintenance of large bodies of troops, was heavy but was adequately met. Commerce was active and the economic position of the country generally was good; the cotton crop found a ready market and trading in the other staple products of the Sudan was maintained. (B. H. B.)

Education.—(Jan. 1, 1941) Government schools: elementary schools 137, scholars 17,184; intermediate schools 11, scholars 357; Gordon Memorial college, scholars 1,308; state-aided Koranic schools 501, scholars 23,000; scholars at non-government (mission) schools, 12,925.

Banking and Finance.—In 1940: revenue £7,143,731; expenditure £7,052,899; public debt (Dec. 31, 1940) £10,023,570.

Trade and Communication.—In 1940 imports were valued at £E3,695,776; the value of exported merchandise was £E5,024,088, of which cotton accounted for £E2,894,833 and gum £E680,969; re-exports £E209,871. Communication: roads, suitable for motor traffic, all weather, *c.* 1,000 mi.; railways 1,991 route mi.; river service 2,325 mi.; motor vehicles licensed (1937) 4,354 cars, commercial vehicles and cycles; telephone subscribers (1938) 2,383.

Agriculture and Mineral Production.—(1938–39) Production: (in metric tons) cotton-seed (1939–40) 102,000; ginned cotton (1939–40) 50,600; millet (1937–38) 315,000; sesamum 33,200; maize 10,300; wheat 8,200; groundnuts 8,600; barley 1,600; gold (1938) 252 kg.

Angola: *see* PORTUGUESE COLONIAL EMPIRE.
Animal Fats: *see* VEGETABLE OILS AND ANIMAL FATS.
Annam: *see* FRENCH COLONIAL EMPIRE.
Anniversaries and Centennials: *see* CALENDAR, 1942, page xx.
Antarctic Exploration: *see* EXPLORATION AND DISCOVERY.

Anthropology. The most important development in anthropology in 1941 was the formation of the Society for Applied Anthropology to "promote scientific investigation of the principles controlling human relations and to encourage the wide application of these principles to practical problems."

Since 1920, anthropology has provided the unifying centre for the various specialists concerned with the study of human relations. This is due to the fact that anthropology is primarily a field science and deals with man as a whole, that is, with all aspects of human relations in all environments, all institutions and for all peoples. Because of this general point of view, anthropological methods and principles have more and more come to be used in the fields of business and political administration, in psychiatry, social work, education, etc., in the solution of practical problems of human relations. In order to further this development, and in particular, to encourage the testing of hypotheses as a routine process in the field of human relations, the Society for Applied Anthropology was formed.

The first issue of its journal, *Applied Anthropology,* is good evidence of the way in which the anthropologist deals with problems of his own society even more than with problems of the non-European groups. It includes an analysis of personnel and labour difficulties in industry together with suggestions as to ways in which they can be eliminated or kept under control ("Organization Problems in Industry," E. C. Chapple); an investigation of the lack of success of settlement houses in accomplishing their objectives, which is shown to be due to the failure to base their policies upon the actual situation in the groups whom they are trying to help, and also includes a case where the use of natural leaders from foreign groups brought about the successful completion of a project ("The Social Role of the Settlement House," William F. Whyte); a general discussion of the way a national morale program should be administered in the United States ("On Implementing a National Morale Program," Margaret Mead); an analysis of the failure of the program of the department of interior to make the Eskimo self-supporting in terms of a reindeer economy because of not adapting the program to Eskimo ways of life ("Native Economy and Survival in Arctic Alaska," Froelich Rainey); a detailed analysis of the administration of a resettlement project in western Pennsylvania with special emphasis on the human factors which condition successful planning ("Community Resettlement in a Depressed Coal Region," F. L. W. Richardson, Jr.); and a critical review of Roethlisberger and Dickson's, *Management and the Worker,* the first systematic use of anthropological methods in industrial research ("Towards a Control System in Industrial Relations," C. M. Arensberg).

The year 1941 also saw the publication of the first results of two important researches on present-day United States communities which had been under way for over a decade under the direction of Professor W. L. Warner of the University of Chicago, formerly of Harvard university (*The Social Life of a Modern Community,* W. L. Warner and P. S. Lunt, Yale University press, New Haven; *Deep South,* A. Davis, B. B. Gardner and M. R. Gardner, University of Chicago press, Chicago). The first of these is a study of a New England community, called "Yankee City," and the volume which appeared (other volumes were to follow) is a statistical and qualitative description of the six social classes postulated by the authors and a discussion of their interrelationships. *Deep South* is a similar study of a southern city and its rural hinterland in which the emphasis is on the relations of Negroes to the whites. According to the authors, each of these groups forms a caste, and the two castes are then subdivided into classes, much in the same way that Yankee City is said to be. After describing the differences in cultural activities of each class and caste, an analysis is given of the economic system of the area with special emphasis on tenancy, the plantation system as well as upon the kind of economic organization of the urban area.

Outside of the work done in the United States, a number of studies appeared in 1941 which were of interest in furthering knowledge of the relationships between non-European and European groups, the field commonly called acculturation. A general survey of the situation in Polynesia, Melanesia and Micronesia was completed by Felix Keesing (*The South Seas in the Modern World,* F. Keesing, with a foreword by J. B. Condliffe, Institute of Pacific Relations International Research series, John Day, New York). This book is an attempt "to define comprehensively the political, strategic and economic role these oceanic islands play in the world today, and especially the modern experience and problems of the peoples native to them." The book is, of course, extremely timely, but it is primarily important as an analysis of the way in which vast human and economic resources have been wasted through lack of skilful planning by responsible administrators, which is primarily due to the failure to base planning policies upon the existing systems of human relations in the several islands. Another book in the oceanic field which appeared in 1941 is a general survey of the Maori of New Zealand with the stress laid on their present-day situation (*The Maori People Today,* edited by I. L. G. Sutherland, Oxford University press, Oxford). The book provides the reader with an excellent account of the way these fine people have adjusted themselves to modern civilization.

In the field of acculturation, several other studies are of interest. In January, the *American Anthropologist* published a group of papers prepared under the leadership of M. J. Herskovits ("Some Comments on the Study of Culture Contact," M. J. Herskovits; "Some Aspects of Culture Change in the Northern Philippines," Fred. Eggan; "Culture Change among the Nilgiri Tribes," D. G. Mandelbaum; "World View and Social Relations in Guatemala," Sol Tax; "Acculturation among the Gullah Negroes," W. R. Bascom; "Some Aspects of Negro-Mohammedan Culture-Contact among the Hausa," J. H. Greenberg;—*American Anthropologist,* vol. 43, no. 1). Of particular interest is a study by J. F. Embree of the Japanese in Hawaii ("Acculturation among the Japanese of Kona, Hawaii," J. F. Embree, *Memoirs of the American Anthropological Association,* no. 59). There is considerable evidence given which can provide a background for administrative action and which can serve as a basis for future work in defining the status of different elements of the Japanese population in Hawaii. As Embree shows, the primary division in loyalties is between the older generation who look towards Japan for leadership and the younger who are loyal to the United States. For the purposes of the administrator, an analysis of the intra-family relationships of groups of Japanese would quickly provide the touchstone for testing where disloyalty would occur.

In contrast to the above methods generally used in the study of acculturation, Robert Redfield contrasted four communities in Yucatan, ranged in order of complexity, a village of tribal Indians, a peasant village, a town serving as trading centre between Spanish and Indian groups, and the city of Merida (*The Folk Culture of Yucatan,* R. Redfield, University of Chicago press, Chicago). Redfield found that there is a progressive increase, as one moves from the tribe to the city, in what he calls the "disorganization" of culture as judged by the fact that "meanings attached to acts and objects are relatively few and inconsistent," in the amount of "secularization," and in "individualization." As a result, he postulates for Yucatan in the future a merging of the Spanish and Indian influences and the formation of a class society with

racial and cultural differences disappearing.

Also of interest in the Central American field are two monographs, one on Guatemala and one on the Maya ("Economics of a Guatemalan Village," C. Wagley, *Memoirs of the American Anthropological Association,* no. 58; *Maya Indians of Yucatan,* M. Steggarda, publication 531, Carnegie Institution of Washington.

Other studies of general interest include Whiting's study of teaching and learning among the Kwoma of the Sepik river, New Guinea (*Becoming a Kwoma,* J. W. M. Whiting, Yale University press, New Haven) in which he describes childhood, adolescence and adulthood among these people and then analyzes the data in terms of learning theory; Ford's autobiography of a Kwakiutl chief (*Smoke from their Fires,* C. S. Ford, Yale University press, New Haven); and Schapera's discussion of the changes in the family system of the Kgatla of Bechuanaland after white influence for over a century (*Married Life in an African Tribe,* I. Schapera, with an introduction by B. Malinowski, Sheridan house, New York).

The year 1941 also saw the publication of the Sapir Memorial volume (*Language, Culture and Personality,* Essays in Memory of Edward Sapir, edited by L. Spier, A. I. Hallowell, S. S. Newman, Sapir Memorial Publication fund, Menasha, Wis.). This volume is divided into four major sections: the first deals with problems of linguistic classification, the second with linguistic behaviour and thought, the third with the development of culture patterns and the fourth with culture norms and the individual. The contributors, all former students of Sapir, provide an effective implementation of Sapir's point of view.

National Defense.—With the outbreak of war, and indeed for some time previous, anthropologists were increasingly concerned with activities connected with national defense. There are roughly three major headings under which these activities may be grouped First, the use of anthropologists as experts on those parts of the world in which they have done research and on which they are specially fitted, by the fact of doing field work, to give advice useful in military and economic warfare. Second, the use of anthropologists in the United States to assist in the many problems connected with the war. These include the study of industrial and community morale, the analysis of the various problems of ethnic groups, the study of food habits with its special emphasis upon raising the national standard of diet, the study of methods of administration and organization, etc. Third, the use of anthropologists in preparing the groundwork for a sound peace settlement. Many responsible persons believed that World War II was the result of ignoring the factor of human relations in the peace settlement after World War I. For that reason, several agencies, both governmental and private, began to gather information about the important countries in the world so that any organization set up after the war would be based upon known facts about the way in which human beings behave in the several countries in question. In this area, anthropologists played an important part in guiding the research activities. (E. D. C.)

Anti-Aircraft Guns: *see* MUNITIONS OF WAR.
Antigua: *see* WEST INDIES, BRITISH.
Antilles, Greater and Lesser: *see* WEST INDIES.
Anti-Lynching Legislation: *see* LYNCHINGS.

Antimony. Although there was some production of antimony metal in the United States from domestic ores during World War I, since then ore production has been small, and the only metal recovery was that in antimonial lead. During 1941 there was a large smelter in Laredo, Tex., operating on Mexican ores and producing metal and oxide; a smaller plant near Los Angeles, Calif., has also been working Mexican ore, and other plants have been producing oxide from Mexican and South American ores. Output at both of the smelters was increased in 1941, and the Laredo plant reported the treatment of some domestic ore. In addition, a third smaller smelter was started at Kellogg, Ida., in March 1940. The output reported in 1940 included 494 short tons of recoverable metal in ores and concentrates, 2,077 tons of antimony in antimonial lead, part of which was recovered from foreign ores, and 11,421 tons of secondary metal. Imports of metal, needle antimony and oxide were reduced sharply, the respective amounts being 209 tons, 228 tons and none in 1940, while there was a two-thirds increase in the metal content of imported ores to 15,733 tons, 35% of which came from Bolivia, 4% from Peru, and 60% from Mexico. Ore imports at the end of the third quarter of 1941 were approximately equal to the total for 1940.

Chinese operations and shipments were seriously cramped by Japan, and in December with the United States at war with Japan, shipments from China might no longer be possible, although loans were made to China by the United States, payment of which was to have been made in antimony. Increasing demand in the United States would have to be met from Mexico and South America. Moderate tonnages of 50% ore were shipped from South Africa to England, and a plant for the recovery of by-product antimony from the treatment of other ores was installed at Trail, B.C., Canada. (G. A. Ro.)

Anti-Saloon League of America, Inc. The Anti-Saloon League of America is a nonpartisan, interdenominational, federated organization formed in 1895 for the purpose of temperance education and legislation. Its work in 1941 was devoted to public education on the alcohol problem, advocacy of total abstinence from all alcoholic beverages and of legislation to minimize the evils growing out of their use.

During 1941 the legislatures of 43 states met. Some states tightened restrictions on sales to minors; women bartenders were prohibited in Illinois and Pennsylvania; a number of states increased penalties for drunken driving, and New York and Oregon provided for chemical analyses of body fluids for had-been-drinking drivers involved in accidents. Numerous other restrictive laws were enacted. Many attempts to liberalize existing liquor laws were defeated.

In South Carolina the league supported the enactment of a statewide prohibitory law, which the people in an advisory referendum in 1940 had instructed the legislature to pass with a provision to replace liquor revenue by some other form of taxation. This measure failed of enactment because of inability to agree upon tax legislation to replace liquor revenue.

The league continued its efforts for local option during 1941. Preliminary returns indicated that no-licence prevailed in the elections in the proportion of 5 to 4.

Following the passage of the Selective Training and Service act on Sept. 16, 1940, the league urged the enactment of protective measures against vice and liquor in the vicinity of military and naval establishments. Congress enacted the May bill on July 11, 1941, authorizing the establishment of zones against commercialized vice in such areas. Owing to the opposition of the secretaries of war and the navy, a section which had been adopted by the senate authorizing the establishment of zones against the sale of alcoholic beverages was stricken out on reconsideration. The national headquarters are at 131 B. st. S.E., Washington, D.C. (E. B. Du.)

Anti-Semitism. As in the year 1940 the violent anti-Semitism which forms one of the fundamental points of the program and activities of national socialist Ger-

many not only continued unabated during 1941, but as a result of further national socialist conquests it spread to such an extent that it became a problem of an intensity and of dimensions unknown in history before, even in the so-called dark ages. While the possibilities for emigration diminished rapidly, until at the end of the period under discussion they totally disappeared, the national socialist regime not only intensified its anti-Semitic legislation to an unheard-of degree, but carried its treatment of the Jews with even greater violence into the newly conquered territories in the soviet union, territories which belong to the most densely populated, as far as Jews are concerned. Though the Jews had been deprived of all possibilities of economic earning in Germany, they were ordered on Jan. 20, 1941, to pay 15% additional gross income tax, "to compensate for their social inferiority." Jews remained barred from any professional or social contact with non-Jews and excluded from any visit to cultural or recreational places or institutions. They received no ration cards for clothing, shoes or coal, and much smaller rations for food than non-Jewish citizens. On Sept. 6, all Jews over six years of age were ordered to wear the Star of David in yellow on their coats or dresses with the inscription "Jew" in black and were forbidden to leave the areas in which they resided without special police permission. In the fall a systematic enforced transportation of all Jews living within the greater German reich began to eastern Poland. They were allowed to take with them only a minimum of clothing and money. All their property, personal belongings, clothing, furniture, money and funds were confiscated. The propaganda minister, Dr. Goebbels, promulgated a ten-point charter, inciting to an undying hatred of the Jews as the mortal enemies: "Anyone who still cultivates private relations with the Jew, belongs to him and must be appraised and treated the same as the Jew." Simultaneously similar curbs were applied to the Jews in the German-occupied countries of Netherlands and Belgium. The fascist government in Italy promulgated during the summer a Jewish "final law" aiming at the elimination of the Jews from any contact with life in Italy.

The fascist government in Vichy France imitated the national socialist legislation which had first been applied to the German occupied zone only. Sweeping racial curbs excluded Jews from practically all fields, not only of cultural, but also of economic activity. Xavier Vallat, a former extreme rightist member of the old parliament and a violent anti-Semite, was appointed on March 29 commissioner-general for Jewish questions. Under him the famous Nurnberg laws of the third reich were not only applied in all their rigour in German-occupied France, but introduced in rapid succession in the nonoccupied zone. The original Jewish statute, proclaimed by Vichy on Oct. 3, 1940, was amplified by a new law on June 14, 1941, and its strict measures were extended to all the French colonies under Vichy control, especially Algeria and Morocco. Only those parts of the French empire under control of the Free French remained free from anti-Semitism.

In view of the adherence of Japan to the "new order" it is not astonishing that for the first time an anti-Jewish association was organized in Japan on Sept. 7, under the leadership of Gen. Senjuro Hayashi with the motto "Jews are the enemies of the world." The war was regarded as a conflict between Jews and anti-Jews. Similarly in all other countries, especially in the United States and in Latin America, anti-Semitism became a characteristic of movements which supported directly or indirectly the "new order," and even of many persons and movements who wished to keep their own countries "neutral" in what national socialist Germans proclaim as a war of fascism against the Jews. National socialist anti-Semitism does not aim only at the extinction of the Jews; it serves, above all, as a most important weapon in the effort to undermine democracy and the will to resistance in the democratic countries. (*See* also FASCISM; JEWISH RELIGIOUS LIFE; JEWS, DISTRIBUTION OF; REFUGEES.)

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Anti-Tank Guns: *see* MUNITIONS OF WAR.

Antonescu, Ion (1882–), Rumanian soldier and statesman, was born in Transylvania June 2 and fought with the Rumanian armies during World War I, after which he was promoted to the rank of colonel. He later became military attaché of Rumania in London and Rome, chief of the army's general staff and war minister. He was named prime minister by King Carol (*q.v.*) Sept. 5, 1940, in the midst of the disorders that followed the partition of Rumania. Antonescu's first act was to demand the abdication of Carol. The prime minister then assumed dictatorial powers and on Sept. 14, 1940, formally promulgated a totalitarian rule. He proceeded to restore temporary quiet in his country and established working relationships with the axis by signing the German-dictated pact of Nov. 23, 1940.

After subduing the Iron Guardist anti-Semitic riots of late Jan. 1941, Antonescu tightened his grip on the government, with German backing, and decreed the death penalty for acts of terrorism and disorder. In a controlled plebiscite of early March, Rumanians approved his regime by a vote of 2,490,944 to 2,816. Iron Guardists continued to be his principal opponents, and in April he announced a plot by the organization to assassinate him during Easter services in Bucharest. Antonescu began to mobilize his army early in June and marched against the U.S.S.R. on the same day (June 22) that Hitler's troops crossed the Russian border. Before assuming the title of generalissimo and commander of the Rumanian armies in Bessarabia, he was reported to have relinquished the premiership to his nephew, Mihai Antonescu. Rumanian casualties in 1941 were heavy, especially around Odessa, and in recognition of the country's sacrifices in the "anti-Bolshevik" crusade, Hitler personally conferred the iron cross on Antonescu Aug. 6, 1941. (*See* also RUMANIA.)

Apples. The commercial crop of apples in the United States in 1941 was estimated by the department of agriculture as 126,076,000 bu., compared with 114,391,000 bu. in 1940 and a six-year (1934–39) average of 125,310,000 bu. The commercial crop includes apples for processing and those sold for fresh consumption. The war affected seriously the export of U.S. fruit in 1941. In the year ending June 30, 1941 only 868,000 bu. were exported, compared with 3,216,000 bu. in 1940 and an annual average of 12,870,000 bu. in the six years, 1931–36. The 1941 apple crop in Canada was by preliminary estimate, 3,436,400 bbl., or about 20% below the 1940 crop.

Table I.—*U.S. Apple Production in Leading States, 1941 and 1940*

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Washington	28,350,000	27,469,000*	Indiana	2,230,000	1,225,000
New York	16,120,000	12,936,000	Massachusetts	2,174,000	2,174,000
Virginia	11,505,000	10,660,000	Maryland	2,070,000	2,077,000
Pennsylvania	9,313,000	9,100,000	Idaho	1,908,000	2,160,000*
California	7,992,000	6,498,000	Delaware	1,794,000	1,909,000
Michigan	7,520,000	5,967,000	Missouri	1,708,000	1,616,000
Ohio	7,064,000	5,074,000	North Carolina	1,365,000	962,000
West Virginia	5,024,000	4,868,000	Connecticut	1,267,000	1,210,000
Illinois	3,509,000	1,876,000	Colorado	1,265,000	1,564,000*
New Jersey	3,150,000	3,296,000	Arkansas	1,025,000	765,000
Oregon	2,673,000	3,263,000	New Hampshire	817,000	925,000

*Includes the following quantities harvested but not utilized owing to excessive cullage: Idaho, 216,000 bu.; Washington, 1,280,000 bu.; Colorado, 50,000 bu.

A greatly reduced production in Iowa, Nebraska, Kansas and northwest Missouri was due to an Armistice day, 1940, freeze

which killed or damaged many trees.

Table II.—*Canadian Apple Production by Provinces, 1941 and 1940*

	1941 barrels	1940 barrels		1941 barrels	1940 barrels
British Columbia	1,415,100	1,081,000	Quebec	252,700	323,500
Nova Scotia	1,148,000	1,151,000	New Brunswick	67,000	53,000
Ontario	553,000	783,000			

(S.O.R.)

Applied Chemistry: *see* CHEMISTRY.

Applied Psychology: *see* PSYCHOLOGY.

Appropriations and Expenditures: *see* BUDGETS, NATIONAL.

Aquariums. The New York aquarium closed its doors for the last time on Oct. 1. It was originally established in 1896 by the city of New York and had been operated by the New York Zoological society since 1902. This closure was considered necessary by the city, incident to construction work in Battery park. The recorded public attendance reached more than 84,000,000 persons from 1902 to 1941, inclusive. The bulk of the collections was distributed among the public aquariums in Washington, D.C., Philadelphia, Pa. and Boston, Mass.; the remainder were being held for public exhibition in a small display under construction in the New York Zoological park, to be opened in the early part of 1942. Research activities formerly centred at the aquarium were continued, in part at the New York Zoological park and in part at the American Museum of Natural History.

Other aquariums as far as reported or able to report were surviving. Collecting in all cases was greatly restricted and as the war continued they all, of necessity, became increasingly exhibits of localized collections. (C. M. BR.)

Aqueducts. The Colorado river aqueduct, constructed by the Metropolitan Water District of Southern California at a cost of approximately $200,000,000 extends 241 mi. from Parker dam on the Colorado river to Cajalco reservoir, 12 mi. south of Riverside, Calif. This aqueduct is capable of delivering 1,000,000,000 gal. daily to Los Angeles and 12 neighbouring coastal cities. With the last of the tunnels on the distribution system completed in 1941, the entire system totalling 392 mi. was in complete operation on Aug. 18, 1941. The Delaware river aqueduct, an 85-mi. pressure tunnel, being built by the board of water supply of New York, is an important feature of the $298,000,000 Delaware project which will add 540,000,000 gal. daily to New York city's water supply, thus increasing the supply 50%. The last of the major tunnelling jobs was holed through Sept. 17, 1941, completing 83.8 mi. of the aqueduct which will carry water 300 to 1,000 ft. underground from the watersheds of the Catskill mountains to Hillview reservoir on the northern boundary of New York city. Final holing through of the entire tunnel is expected in the spring of 1942. The All-American canal, biggest irrigation ditch in the United States, was in operation its full length during 1941. It carries water diverted from the Colorado river by Imperial dam a distance of 80 mi. into Imperial valley. With its 130-mi. Coachella branch canal, excavation for about half of which is completed, water will be supplied for 1,000,000 ac. of land in southern California. As a part of the Boulder canyon project, the All-American canal system was being built by the bureau of reclamation at an estimated cost of $38,500,000. The boring of a 13.1-mi. tunnel, which will carry water from the western slope through the Continental Divide to irrigate agricultural lands in northeastern Colorado was proceeding from both ends, with approximately one-third of the entire length either completed or under contract in 1941. Two tunnels of a 40-mi. aqueduct to convey water from Deer creek reservoir in Provo canyon over mountain slopes to Salt Lake City, Utah, were completed and work was under way on a pipe line in 1941. On the Central valley project in California the first 29 mi. of the 46-mi. Contra Costa canal were in use serving fresh water to industries, cities and farms; and work was in progress on the 40-mi. Madera canal to carry water from Friant reservoir to thirsty lands in the San Joaquin valley. A pipe line aqueduct project was put in service in 1941 bringing to Toledo, O., a supply of good water from Lake Erie to replace the old and unsatisfactory supply from the Maumee river. Construction of the Key West aqueduct, to extend from the mainland near Miami, Fla., to the tip of the Key West peninsula, a distance of 134 mi., was planned for immediate construction in Dec. 1941 to supply fresh water for the navy and the Key West civilian population. (*See* also CANALS AND INLAND WATERWAYS; DAMS; TUNNELS.) (J. C. PA.)

GRAVITY-ARRESTER of the Delaware river aqueduct, under construction in 1941 to add 540,000,000 gal. daily to the water supply of New York city. The series of steps slows the rush of water as it issues from a tunnel, so that it will flow smoothly through open-country channels

Arabia. Total area (est.) 1,000,000 sq.mi. Total pop. (est., 1937) 9,300,000; Saudi Arabia, 4,500,000; Yemen 3,500,000; Oman and Muscat 500,000; Kuwait 80,000; Trucial Sheikhs 80,000. Language: Arabic; religion: Mohammedan. Rulers: Saudi Arabia, King Abdul Aziz Ibn Sa'ud; Yemen, Imam Yahaya Muhammad Hamid ed Din; Oman and Muscat, Sultan Sayyid Said bin Taimur; Kuwait, Sheikh Ahmed Ibn Jabir al Subah.

History.—The year 1941 opened with the discovery of a conspiracy in Mecca against King Ibn Sa'ud's regime. In spite of its suspected instigation by the axis, it was not a very important affair and was easily suppressed; one of the personalities inculpated was executed and several others were imprisoned. This was practically the only untoward event in a year during which the Arabian peninsula remained as a whole tranquil and untouched by the war, except insofar as war conditions considerably reduced the number of pilgrims journeying to the Hejaz from overseas for the pilgrimage.

King Abdul Aziz Ibn Sa'ud continued to abide loyally by his friendship with Great Britain. Thus during Rashid Ali's revolt in Iraq in May he refused to render any help, either diplomatic or military, to the insurrectionary regime, in spite of Rashid Ali's move in sending one of his ministers, Naji Suwaydi, on a mission to Riyadh. He also interned German and Italian military refugees from East Africa. The Imam of the Yemen took up a more ambiguous attitude, and the activities of axis agents in his territories seem to have continued in 1941.

If the policy of King Ibn Sa'ud was pro-British, still more was it pro-Arab. He continued to take a close interest in the affairs of Syria, Palestine and other Moslem and Arab countries, and to do what he could to further the interests of their populations. His concern for the welfare of his fellow-Moslems was shown in the speech which he made during the pilgrimage in January. "Not one night," he declared, "do we lie down without anxiety for the cause of all Moslems, anxiety for the cause of our brethren of Syria, Palestine, Iraq and Egypt." His strong pan-Arab and Islamic sentiment was shared, it is probable, by a large proportion of his subjects, no less than by the imam of the Yemen and the other rulers of the peninsula. (A. H. Ho.)

TRADE.—With India (1938–39): Oman and Muscat, imports £283,987; exports £153,568; other states of Arabia, imports £485,932; exports £48,172. With the United Kingdom (1938): Saudi Arabia and Yemen, imports £94,960; exports £28,871; Oman and Muscat, Trucial Sheikhs and Kuwait, imports £40,262; exports £18,354. Total trade of Oman and Muscat (1938–39): imports Rs. 48,76,193; exports Rs. 33,31,939; Kuwait (1937–38): imports £410,812; exports £174,006. (*See* also ISLAM.)

Archaeology.

Western Hemisphere.—Archaeological field work, during the year 1941, diminished in the United States and increased in Mexico and especially in South America. Reallocation of Work Projects administration funds toward defense work reduced the number of state-wide archaeological projects; on the other hand, the Institute of Andean Research launched several important archaeological expeditions in Mexico, Central and South America.

In the United States archaeological efforts centred around the problems of: (1) the antiquity of man in North America; and (2) the more sedentary aboriginal cultures.

1. The association of man-made objects with extinct animal forms still constituted the earliest human horizon in America. No direct association of human skeletal remains had, up to 1941, been recovered. The Smithsonian institution excavated a new site ten miles south of San Jon, N.M., where various types of stone implements were found in association with both extinct and modern bison and extinct mammoth. The University of Michigan continued explorations of old beach lines formed some 10,000-15,000 years ago by the waters of Lake Huron, along the northern shore of that lake near Killarney, Manitoulin Island, Ont., Canada. Archaeologists from the University of Pennsylvania museum excavated Yuma sites in southwestern Wyoming near the town of Eden.

2. Sedentary aboriginal cultures:

In Alaska the American Museum of Natural History continued explorations at an important site known as Ipiutak on a barren gravel spit of Point Hope, 130 mi. above the Arctic circle. More than 500 tombs were excavated in an area of six miles leading from the ancient town. The Ipiutak culture is distinguished by its ivory art, finely chipped flat tools, and emphasis on land hunting gear. Laboratory analysis of the artifacts and human skeletal material may furnish valuable information concerning the migrations from Asia to North America.

The Eastern Washington State Historical society, the University of Washington and Washington State college combined efforts in continuing an archaeological survey near Hellgate, which revealed two distinct levels of occupation. Other sites were excavated between Kettle Falls and the Canadian boundary. The Los Angeles museum continued a survey and excavation of caves and shell middens among the Channel Islands off the coast of California. One cave at the southern end of San Clemente Island produced drilled and tarred planks from a plank canoe, fish harpoons, woven cloth, fishhooks, sea otter robes, etc.—material similar to that obtained from the natives by Capt. Vancouver in 1793. The University of California collected archaeological specimens from vated in the coast region north of Golden Gate. The desert laboratory of the Southwest museum worked two large sites near Twenty-nine Palms, Calif.

The University of New Mexico explored small house ruins in Chaco canyon. The Field Museum of Natural History continued excavations of an important site near Reserve, N.M. In a large rock shelter on the Papago Indian reservation, near Tucson, Ariz., significant additions were made to the prehistoric chronology by the University of Arizona. Within the 15 ft. of trash deposit a record was obtained, extending from modern times back through pre-pottery and pre-agricultural levels. The Amerind foundation continued work at Tres Alamos on the San Pedro river in southeastern Arizona. The Carnegie Institution of Washington sponsored excavation of a Basket Maker II site along the Animas valley near Durango, Colo. The Colorado Museum of Natural History continued archaeological explorations in western Colorado. The University of Utah carried out extensive surveys and some excavations in central and northern Utah.

The North Dakota Historical society proceeded with an archaeological survey and exploration of Mandan and Arikara sites along the Missouri river in central North Dakota. The museum of the University of South Dakota excavated more than 200 protohistoric Arikara house sites, refuse middens and a smaller fortified village along the Missouri river in Hughes county, S.D. Excavations by the Nebraska State Historical society indicated that maize was cultivated by some of the earlier cultural horizons. Excavations were directed in Oklahoma by the state university.

The University of Minnesota excavated sites at Lake Shetek in southwestern Minnesota, and other villages at Tuttle and Fox lakes near the Iowa line in central Minnesota. The University of Missouri carried on excavations of Siouan sites in Missouri. The Academy of Science of St. Louis made archaeological investigations in Jefferson and New Madrid counties in eastern Missouri. In Illinois the state museum and state parks division excavated a mound within the famous Cahokia mound group near East St. Louis; and the University of Chicago continued large-scale explorations at the Kincaid site in the southern part of the state. The Indiana Historical society carried on excavations throughout 1941 at the Angel site in southwestern Indiana. The Ohio State museum directed the excavation of a small Adena mound north of Chillicothe, O.

Under the sponsorship of the University of Kentucky, archaeological excavations were begun in the area to be flooded after the building of the Kentucky dam by the Tennessee Valley authority in the southwestern part of the state; other important excavations were completed in central and western Kentucky. The University of Tennessee directed the excavation of other basin sites to be flooded by the building of Tennessee Valley authority dams, work being concentrated in the Watts Bar dam and on the Tennessee side of the Kentucky dam reservoir areas. The national park service sponsored excavations of small sites within the Ocmulgee national monument at Macon, Ga. Most of the agencies in the Mississippi river valley were assisted by labour furnished through the Work Projects administration.

Historical archaeological excavations at Jamestown island, Va., by the national park service, continued to reveal numerous objects associated with the early 17th century settlement on the island. Similar excavations near Plymouth, Mass., were inaugurated under private sponsorship in connection with the remnants of houses erected by the Pilgrims. The Massachusetts Archaeological society tested early Indian occupation sites in various sections of eastern Massachusetts. The Long Island chapter of the New York Archaeological association explored a section of an important site on the north branch of Long Island. Vassar's Hud-

zons along the Hudson river in New York. The Pennsylvania Historical commission recovered evidence of Hopewell-like cultural material near Warren in northeastern Pennsylvania.

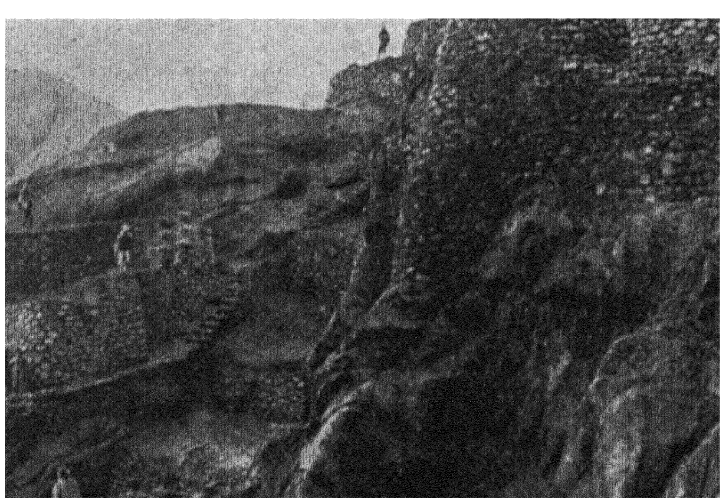
The Smithsonian institution and the National Geographic society jointly sponsored archaeological excavations at a large prehistoric site at Cerro de las Mesas in the southern part of Veracruz, Mex. Two sculptured calendar stones with dates in the first and fourth katuns of the Maya calendar were uncovered. More than eight tons of cultural material were obtained through stratigraphic excavations. A remarkable cache of 782 specimens of precious jade—some the finest examples of sculptured jade from the western hemisphere—was discovered in one of the large mounds. The Smithsonian institution also sponsored an archaeological expedition in the state of Coahuila in northern Mexico, where intensive excavations in two caves and one rock shelter produced well preserved cultural material consisting of feathers, baskets, sandals, throwing sticks, fur robes, grooved clubs and desiccated bodies. The Direccion de Monumentos Prehispanicos of the Mexican government directed explorations in Yucatan, Palenque, Monte Alban, Cholula, Michoacan and Hidalgo; other organizations sponsored work near Acapetlahuaya and in the state of Jalisco.

The Peabody museum of Harvard university directed research upon Chiriqui ceramic types in Panama. Middle American Research institute of Tulane university sponsored an archaeological survey in Honduras and Costa Rica. Carnegie Institution of Washington included in their archaeological program explorations in Guatemala, Honduras, Salvador and Nicaragua, where a large section of buried volcanic strata containing human footprints was uncovered in such a manner as to preserve these imprints of man *in situ*.

Under the direction of the Institute of Andean Research archaeological expeditions were inaugurated in the following states of South America: Venezuela, Colombia, northern Peru and Ecuador, southern Peru and the north Chile coast, southern Peru and the Bolivian highlands. These excavations were made possible through a grant from the Co-ordinator's Committee on Commercial and Cultural Relations Between the American Republics and the wholehearted co-operation of archaeologists in those states of South America. The Peruvian government continued archaeological explorations near Lima, especially at Pachacamac, Tambo Colorado in Pisco, and a site in the Nazca valley. Other states in South America continued their archaeological explorations.

BIBLIOGRAPHY.—Many technical archaeological reports were published during 1941 (vol. 43, *American Anthropologist*, and vol. 7, *American Antiquity*). The most outstanding publication for 1941 was *Aztecs of Mexico*, by George C. Vaillant, which describes, on the basis of archaeological evidence and historical documents, the origin, rise and fall of the Aztec nation (1941). (F. M. SE.)

SECTION of "the city above the clouds," one of the two lost Inca cities discovered near Cuzco, Peru by the Wenner-Gren expedition in 1941. The granite houses, walls and stairways are remarkably well preserved



Eastern Hemisphere.—In a very real sense the following summary of old world archaeological activity during 1941 is a tribute to those scientists who, in spite of the war, managed to make significant contributions to knowledge. The list is by no means exhaustive, since communication with several countries was virtually impossible. In addition to many new discoveries, eight important books were published, notwithstanding the fact that several of the authors were actively engaged in war work. Indeed the war provided many archaeologists with an opportunity for assimilating the tremendous bulk of new material that was brought to light since 1930. At the conclusion of this article a bibliography is given for those desiring further information; other references are cited in the text.

The Palaeolithic Period.—Further details were published by *Time* concerning the Altamira-like cave paintings from the Grotte de Lascaux, near Montignac in the Dordogne region of south-central France, the discovery of which was announced in 1940. Six of the scenes, including one 39 ft. long showing a herd of woolly horses, two goats and a wild cow, are reproduced in the *Time* article, which should be consulted by all students of primitive art.

Dr. F. W. Wulsin's book, *The Prehistoric Cultures of North-West Africa*, published by the Peabody museum of Harvard university, is the first complete account of the archaeological material from Tunisia, Algeria and Morocco that has ever been compiled. An enormous body of facts, especially those dealing with the Old Stone Age, was collated and synthesized by the author. This book, intended primarily for reference purposes, demonstrates the important role played by northwest Africa from early times down to the historic period in the diffusion of culture into Europe. It likewise points the direction which future research should take in this region by emphasizing the existing problems.

The Mugharet el 'Alyia (High cave), an important cave in Tangier, northwest Africa, which contained both atypical Upper Palaeolithic and Neolithic levels, as well as a mandible fragment and a molar tooth of Neanderthaloid affinities, was in 1941 completely excavated. In 1939 Prof. Carleton C. Coon of Harvard university dug a large trench through the deposits, but the war prevented him from returning to finish the work. However, in spite of very difficult circumstances, this was successfully achieved by Dr. Ralph Nahon and Hooker Doolittle, both former residents of Tangier. The material was placed in 1941 in the Peabody museum, Cambridge, Mass., where the complete excavation report was being prepared for publication by Bruce Howe.

At Sidi Abderrahman, near Casablanca (Morocco) on the Atlantic littoral of northwest Africa, Prof. Breuil announced that MM. Neuville and Ruhlmann had discovered an important Lower Palaeolithic archaeological horizon. The latter yields large flakes manufactured by the so-called Clacton technique in association with hand axes of Abbevillian type. Since the site is situated on an ancient dune 90 mi. above present sea level, and since the implements are *in situ* in it, Sidi Abderrahman furnishes definite evidence that western Morocco was occupied by man during early post-Sicilian times.

In 1941 Prof. C. van Riet Lowe, director of the bureau of archaeology of the Union of South Africa, and E. J. Wayland, director of the geological survey of Uganda, jointly prepared an extensive report covering the Pleistocene geology and Palaeolithic archaeology of Uganda. It is understood that the conclusions of these authorities differ in several fundamental respects from those arrived at by T. P. O'Brien, whose book on *The Prehistory of Uganda Protectorate* appeared in 1939. The report, already submitted to the Uganda government, was planned to be published after the war.

To provide a basis for dating archaeological material in South Africa (not only finds directly associated with recognized geo-

logical horizons, but also those obtained by excavation in cave sites) H. B. S. Cook summarized the known facts pertaining to the Late Cenozoic deposits of the region. His report, *A Preliminary Survey of the Quaternary Period in Southern Africa,* published by the bureau of archaeology of the Union of South Africa, includes a discussion of raised beaches, river terraces, non-fluviatile deposits, Pleistocene mammals and caves. The author's tentative conclusions regarding the correlation of the main events are outlined in tabular form.

A large and carefully documented series of palaeolithic implements, comprising Acheulean, Levallois and Upper Palaeolithic types, was collected by Peter D. Cornwall, working for the University of California and Harvard university, on the mainland of Arabia adjacent to the island of Bahrein. The assemblage also includes mesolithic, neolithic and Bronze Age material, in addition to the contents of graves contained in tumuli roughly dated 600–300 B.C. The importance of Cornwall's work in the hitherto little known archaeological region cannot be overestimated.

Preliminary excavations at the cave of Amir-Temir in the mountains of Uzbekistan established the presence of three palaeolithic horizons in central Asia. The oldest of these, very similar to the upper level of Teshik-Tash, was referred to the Mousterian. The work at this place, the second palaeolithic site to be reported from this important region, was being directed by Dr. A. P. Okladnikov of Tashkent.

All students of early man welcomed the publication of Dr. H. de Terra's views on the Pleistocene of China (*Pub. No. 6* of the Inst. Géo-Biol., Peking). The most important single contribution of the work is that it focuses attention on the evidence of former glaciations in China. In the far east, as elsewhere in the old world, the Pleistocene climate underwent a series of major fluctuations, making it possible to date early human fossils as well as Stone Age implements more precisely than heretofore. According to de Terra, the *Sinanthropus* deposits at the famous site of Chou Kou Tien may now be correlated with the 2nd Interglacial period in northwest India.

Fossil Man.—A. D. Lacaille of the Welcome Historical Medical museum, London, reported that he has been working on a large collection of Lower Aurignacian (Châtelperronian) flint and bone implements from the important site of Châtelperron. Associated with this material, excavated some years ago, a hitherto unpublished Upper Palaeolithic skull was "discovered," which was being studied by Prof. Morant. Of interest are the facts that the vault is extraordinarily thick and that it is very like the Combe-Capelle specimen in many respects.

In a communication to the writer, Prof. C. van Riet Lowe stated that his assistant, Dr. B. D. Malan, excavated a cave with great success in the Union of South Africa. The site yielded "a Neanderthaloid skull with quantities of implements made on flakes struck from advanced Levallois (Middle Stone Age in South Africa) cores—plus a good fauna." This discovery is important for two reasons: (a) the human fossil is the first Neanderthaloid to be found in a definitely dated horizon in southern Africa (the age of Rhodesian man is uncertain), and (b) it is the only skull that has ever been found in this region in an undisputed Middle Stone Age context. The Carnegie Institution of Washington announced that Dr. G. H. R. von Koenigswald had discovered a very heavy human mandible belonging to an absolutely new type of fossil man in the upper part of the Lower Pleistocene beds (Djetis horizon) of Java. In several respects this new specimen, the second Lower Pleistocene human fossil to be found in Asia, differs from *Pithecanthropus erectus*—the Java ape-man. Presumably it would be accorded a new generic status.

Neolithic and Later: The Near East.—Florence E. Day established that the Islamic Omayyad (A.D. 661–750) ceramics found at Tarsus in Cilicia were actually manufactured at the site. This green glazed pottery has affinities with T'ang dynasty (A.D. 617–906) wares of China—evidence that further confirms the intimate contact between the near and far east which existed at this period. For on the basis of A.D. 8th century Chinese records, it has been revealed that there were Chinese artisans at Kufa in Iraq during T'ang times.

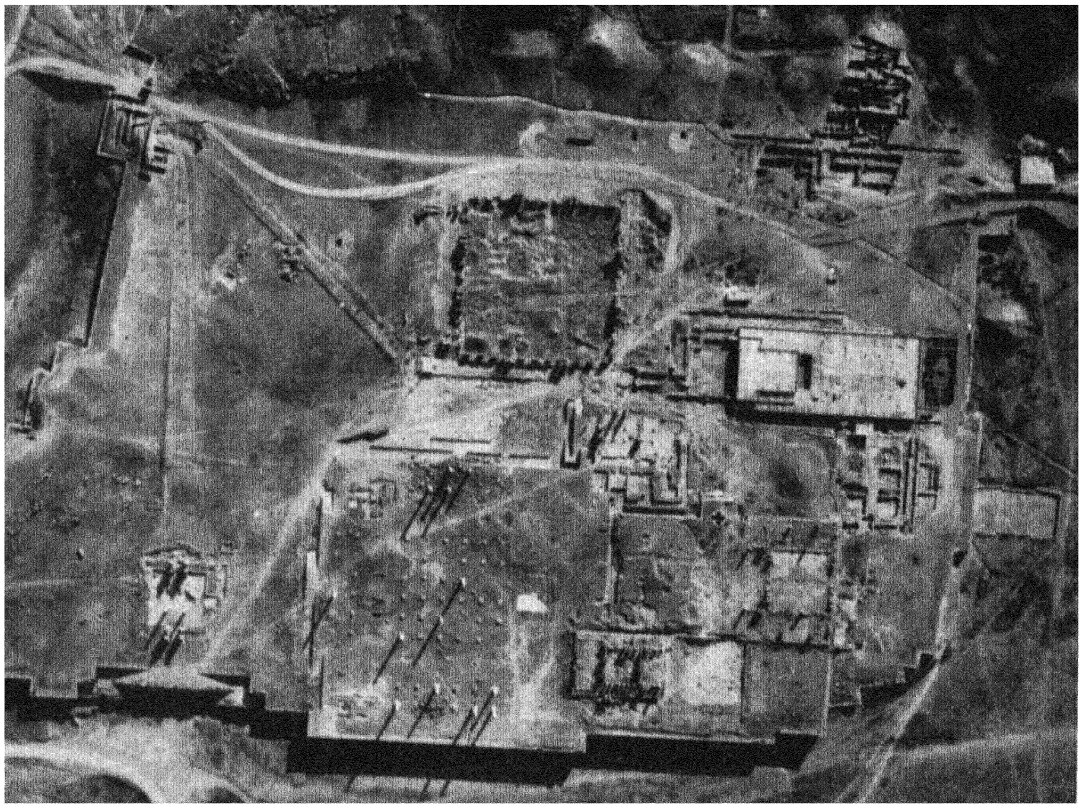
On the northern outskirts of modern Hama, situated in Syria on the Orontes river halfway between Damascus and Aleppo, excavations were made on a large mound by the Carlsberg foundation of Copenhagen from 1930–38. The work, details of which were available in 1941 for the first time, was directed by Dr. H. Ingholt. Twelve different levels of civilization (the last city was destroyed by Sargon in 720 B.C.) were revealed. The oldest level, which goes back to the 5th millennium B.C., overlies virgin soil, and it is characterized by burnished or fluted brown and black pottery. Stratum 11 contains characteristic Tel Halaf painted ware, together with stone artifacts, a terra cotta seal and an animal figurine of clay.

Above these neolithic strata are ten more levels which throw light on the development of Bronze and Iron Age culture at ancient Hama.

In Palestine joint excavations by the American School of Oriental Research and the Hebrew university, near the school's property in Jerusalem, uncovered the remains of the old city wall. A stretch 23 mi. long, including a large tower, was exposed. This segment is on a line with previously discovered remains which together cover a total length of some 600 mi. This so-called "third wall," referred to by Josephus, was built by Herod Agrippa and the Jews between A.D. 40 and 70. The pottery found overlying the portion discovered in 1941 demonstrates that by the Byzantine period this old wall had been completely stripped of its superstructure blocks for building purposes.

Europe (General).—From the point of view of European archaeology it is difficult to overemphasize the importance of C. F. C. Hawkes's book, *Prehistoric Foundations of Europe to the Mycenean Age.* The author's conclusions differ in several respects from those of Prof. V. G. Childe, whose second edition of *The Dawn of European Civilization* was hitherto the only up-to-date general book of a similar nature that had appeared in the English language. Both Hawkes and Childe stress the importance of the principles of diffusion and geographical factors with regard to the interpretation of the development of culture. Both attempt to synthesize the sum total of the evidence—social, cultural and economic—rather than certain classificatory abstractions. Although the scope of Hawkes's book is broader than that covered by Childe, there are available for students of the prehistoric aspects of occidental civilization two authoritative and unbiased accounts of the cultures that flourished in Europe up to the middle of the 2nd millennium B.C.

THE "THRONE OF SOLOMON," a fortress in northwestern Iran, as seen from the air by members of the 1935–37 expedition of the Oriental Institute of Chicago. This photograph appeared in *Flights over Ancient Cities of Iran,* published in 1941



DETAILS OF THE ANCIENT PALACE TERRACE of the Persian kings at Persepolis stand out in bold relief in this aerial photograph taken by the Oriental Institute of Chicago during its expedition of 1935–37 and published in 1941 in *Flights over Ancient Cities of Iran*

Cyprus.—On the basis of new data obtained by careful excavation at the stratified site of Kourion, it was possible to study the history of the script used in Cyprus during the Classical period. According to Dr. J. F. Daniel, this was the last direct descendant of the Minoan linear scripts. At Kourion it first appears in the Late Cycladic I-A level and remains in use through L.C. III-A times—from about 1500–1150 B.C. Since the characters are derived directly from the Minoan linear script A and are devoid of Helladic influence, the new evidence demonstrated that the Late Bronze Age syllabary of Cyprus cannot have been introduced by Achaean colonists.

Greece.—Prof. W. B. Dinsmoor's detailed analysis of the dates when architectural and sculptural repairs were made on the temple of Zeus at Olympia resulted in his recognition of the fact that these repairs were rendered necessary by an earthquake which occurred during the first half of the 2nd century B.C. Thus it was shown that the much disputed substitute statues (*Ersatzfiguren*), discovered more than 60 years ago among the pedimental sculptures of the temple, may be dated between 169 and 165 B.C.

Italy.—In early 1941 mention was made of a steatopygous statuette, found near Reggio Emilia and originally attributed to the Upper Palaeolithic period. Subsequent excavations at this site, however, revealed that the locality where the statuette was discovered—Chiozza di Scandiano—is an extensive neolithic cemetery containing numerous graves. These yielded implements of flint and polished stone, as well as typical neolithic pottery. Since the figurine was undoubtedly associated with one of these burials, views regarding its antiquity based on typological analogies have had to be somewhat modified.

An exhaustive study of the published reports dealing with excavations at Terra Mare settlements in northern Italy, as well as a complete analysis of all the important collections from those sites, convinced Gösta Säflund (*Skrifter Utgivna av Svenska Institutet i Rom*, vol. vii) that the plan of the typical Terramara, as reconstructed by Pigorini (on the basis of his 19th century work at Castellazzo), is only a figment of the excavator's imagination. For in reality a Terramara is a squalid Bronze Age village containing round or rectangular huts, which may or may not be raised on piles. As Dr. G. M. A. Hanfmann pointed out in his review of Säflund's book (see *Amer. Jour. Arch.*, xlv: 308–314 [1941]), those sites cannot conceivably be regarded as the forerunners of Roman camps. Nor does the evidence uphold Pigorini's theory that the Terra Mare were the originators of metal working in northern Italy. From a chronological point of view the Terra Mare arrived in Italy about the middle of the 2nd millennium B.C. (1600 B.C. at the very earliest) and began their decline during the Iron Age invasions (*c.* 900 B.C.), according to Hanfmann. On the basis of cultural analogies, this group is to be regarded as representing a prehistoric infiltration of people from central Europe during Bronze Age times.

As a result of building and constructional work, including the excavation of a deep-level underground railway, many new details pertaining to ancient Rome came to light. Among these were the remains of the temple of Bellona, dedicated a few years after it was vowed by Appius Claudius in 296 B.C.

The year 1941 witnessed the culmination of the huge official project for uncovering the major portion of Ostia, the port of ancient Rome, on which Guido Calza and his staff were engaged for some years. During the final season a large courtyard, without arcades and surrounded by more than 20 rooms, was uncovered at that site. Several fine examples of statuary belonging to the A.D. 2nd and 3rd centuries were found.

Portugal.—European archaeologists were eagerly awaiting further information concerning Prof. H. Breuil's survey of prehistoric sites and ancient monuments conducted on behalf of the Portuguese government. It was understood that Breuil's report would be published in Lisbon.

England.—Although the war put a temporary stop to archaeological research in England, it had by no means halted intellectual activity. Indeed it offered an opportunity for synthesizing the tremendous collection of facts that had been accumulating since 1932. Two of the foremost British archaeologists—Prof. V. G. Childe and Dr. Grahame Clark—produced books of a fundamentally different nature. Childe's *Prehistoric Communities of the British Isles* was intended for students of European archaeology, whereas *Prehistoric Britain* by Dr. Clark was written primarily for the general public. Each authority stressed the importance of the social life of prehistoric man as the key to interpreting problems involving cultural development, economic activity and chronology—a far cry from the now obsolete approach based entirely on typological considerations.

Scotland.—Prof. V. Gordon Childe of Edinburgh university announced that he had successfully dug out a Viking house at Freswick, which was brought to light during the course of commercial excavations. The site belongs to the A.D. 13th century or later.

Prof. Childe's survey of the relation of chambered cairns to recent settlement on Rousay disclosed the interesting fact that each group of cairns corresponds closely to a recent township (croft) in the islands. This suggests that an economy very similar to that of the 20th century characterized Late Bronze Age life on Rousay. The cairns themselves do not appear to be the burial places of rich chieftains, but rather genuinely communal.

Ireland.—In Eire pollen analysis as a means of accurately dating archaeological finds from bogs and other unaerated deposits was making rapid strides. Drs. Mitchell, O'Leary and Raftery demonstrated that a Bronze Age halberd and a typically Irish looped spearhead in reality may be assigned, on the basis of the palaeobotanical evidence, to periods that do not correspond to those suggested by the typology of the objects themselves.

Professor Seán P. O'Ríordáin of University college, Cork, continued his excavations at Lough Gur in County Limerick during 1941. In a small house site enclosed partly by low upright stones, and partly by natural rock, fragments of pottery in association with stone implements were found. This evidence, strongly suggesting a neolithic occupation in the Lough Gur region, is in accord with the implications of Professor O'Ríordáin's previous discovery of quantities of Windmill Hill (neolithic) pottery at the site.

Northern Europe.—Carl-Axel Moberg's *Zonengliederungen der vorchristlichen Eisenzeit in Nordeuropa* (Lund, 1941) is a comprehensive treatise on the fifth and sixth periods of the Northern Bronze Age, the three periods of the Pre-Christian Iron Age, and the earlier part of the so-called Roman Iron Age in northern Europe. This work was welcomed by a wide circle of old world archaeologists. It is an excellent reference book in which the author attempted to define the relationships of the several cultures involved on the basis of geographical and climatic factors.

Sweden.—An important series of pagan monuments found on the island of Gotland and dating from the 5th to the 11th centuries was described by Dr. Sune Lindqvist in his book, *Gotlands Bildsteine*. These monuments are sculptured with figures of horsemen, warriors, ships, etc. The book adds a great deal to existing knowledge of the culture of Gotland during dark age times when this island was an important trading centre connecting the east, via the Russian rivers, with the Baltic and Atlantic sea routes.

U.S.S.R. (Uzbekistan).—From the A.D. 9th to the 15th centuries Uzbekistan (Russian Turkestan) was the centre of an extensive state. In fact during the Samanid period its control extended to northern Afghanistan, Khurasan and other parts of Persia. In the two most important cities—Samarkand and Bukhara—there were many important architectural monuments, which were falling into a bad state of repair. It was gratifying to learn, therefore, that the soviet government established a Committee for the Preservation and Study of Monuments of Material Culture. In 1941, 80 of the most important Samanid buildings were being restored.

With regard to prehistoric times the potentialities of Uzbekistan cannot be overemphasized. Huge *tells*, such as Afrasiyab—the site of ancient Samarkand—were identified. By the close of 1941 there had been very few controlled excavations on this or any of the other ruined cities in the region.

A series of burial mounds between the Chirchik and Boz-Su rivers, near Kaunchi-Tepe, was being excavated by the newly formed Uzbekistan Committee for the Preservation and Study of Monuments and Material Culture. These barrows contained thousands of burials representing three periods: (a) typical Late Bronze Age tumuli similar to those of central Europe and the Ukraine, (b) a group of Iron Age burials of about 500 B.C., and (c) catacomb graves containing elaborate funerary furniture and attributed to A.D. 3rd and 4th centuries.

Iran.—Erich Schmidt's book, *Flights over Ancient Cities of Iran* (Sp. Pub. Oriental Inst. Uni. Chicago), is not only an outstanding contribution to Iranian archaeology, but also a brilliant demonstration of the infinite possibilities which aerial photography offers the archaeologist; for (a) explorations and general survey work can be accomplished quickly and effi-

ciently, (b) it is possible to document prehistoric sites in their topographical environment, and (c) the vertical air view provides the excavator with a base-map—a complete record of surface clues often invisible from the ground. Indeed, the air-map is actually superior in many respects to the ground survey, which requires several months to complete and considerable expenditures. The publication of *Flights over Ancient Cities of Iran* may be considered the archaeological "event of the year" as far as the old world is concerned. In addition to being the most elaborate and comprehensive work that has ever appeared in the field of aerial archaeology, this book points the direction along which research will be conducted in the future.

Information was in 1941 available regarding the 1937 excavations by the American Institute of Iranian Art and Archaeology at Kuh-i-Dasht in southern Luristan. In a circular stone sanctuary a considerable number of small bronzes, revealing a superlative skill, were brought to light. These votive figures chiefly represent goats, frogs and a miniature unicorn—all in the round—as well as an interesting series of repoussé disks. Several of the latter, known from other sites in Iran and the Caucasus, display Assyrian affinities. It was established that they were used as cult standards rather than as hairpins. For the most part the Kuh-i-Dasht bronzes may be dated to the end of the 2nd millennium B.C. (*c.* 1200 B.C.).

China.—Sites containing Late Neolithic black pottery, hitherto known only from Shantung, Honan and Anhwei in eastern China, were reported by Sterling S. Beath from the vicinity of Hangchow in Chekiang province, south of the Yangtze valley. This ware is for the most part wheel-made and burnished on the wheel when nearly dry. Its eggshell thinness indicates a highly developed ceramic technique.

Philippines.—Rev. J. F. Ewing, S.J., was in the Philippines in 1941, where he secured a large anthropometric series from the island of Mindanao. He also announced that he had discovered rich mesolithic as well as neolithic sites in this area. Although Father Ewing did no actual digging, nor was he likely to during the war, it was very significant that stone implements and pottery, of the same types as those found by Dr. Beyer in the vicinity of Manila, also occur on Mindanao.

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Archery. The 61st annual tournament of the National Archery association, which was held at Portland, Ore., Aug. 5–9, 1941, was noteworthy because in every target event the record was either broken or tied. Larry Hughes of Burbank, Calif., won the men's championship and set up records of 141–827 in the Single York and 90–744 in the Single American. Miss Ree Dillinger of Bloomfield, N.J., won the ladies' championship by the narrow margin of one point over Miss Mildred Miller of Milwaukee, Wis., the final standing being Miss Dillinger 2,098, Miss Miller 2,097. Miss Dillinger made a new record of 72–584 in the Single Columbia and Miss Miller made a new record of 72–522 in the Single National. Dorothy Axtelle of Tacoma, Wash., won the girls' championship and established a new record of 144–1,022 in the Double Columbia. Billy West of Joplin, Mo., won the boys' championship and hung up a new record of 180–1,426 in the Double Junior American.

The 12th Annual Intercollegiate contest sponsored by the National Archery association was held in May with 148 teams (8 archers to a team) representing 95 colleges competing. In the women's division, first place was taken by Team I from the University of Connecticut, Storrs, Conn., and in the men's division, first place was taken by the team representing Los Angeles City college, Los Angeles, Calif.

In May 1941 the National Archery association also sponsored an interscholastic contest between teams (6 archers to a team) representing high schools. First place in the girls' division went to Bloomfield high school, Bloomfield, N.J., and first place in the boys' division to Forest Grove Union high school, Forest Grove, Ore.

The National Field Archers association inaugurated and successfully carried out a series of field archery contests by mail.

An outstanding performance of the 1941 archery season was that of Larry Hughes, the national champion, in making a Single York round score of 142–910 in a competitive event. (L. C. S.)

Architects, American Institute of: *see* AMERICAN INSTITUTE OF ARCHITECTS.

Architecture. The war was too dominant a factor in the daily and national life of 1941 to allow architecture to continue along its normal progress as an "art of building." The buildings in which individuals were free to choose their form of expression and carry out their experimentations could no longer be built. The international exchange of thought which had stimulated architectural progress had ceased. No new theories as important as those of Frank Lloyd Wright, Le Corbusier or Walter Gropius were expressed.

The architecture of the war period became a science of building, which dealt with the problems of supplying as expeditiously as possible the buildings needed for the expansion of the armed forces, of the industries producing war material, and of the housing and incidental building required for the security of nations. The war imposed limitations; shortages in materials were felt, air-raid precautions had to be considered, governmental control was increased, and construction had to proceed with unusual speed. The combination of these factors with the increasing complexity of architecture led toward greater co-operation between specialists. Large-scale planning was undertaken, not only in dealing with the emergency, but also in preparation for the postwar period.

Design and Planning.—The design of buildings for abnormal war-time needs demanded, aside from rapidity of construction, unusual economy and efficiency.

In industrial architecture the one-story factory established itself as the prevalent type due to the manufacturers' desire for large, clear areas unobstructed by columns, stairs or elevators. Such buildings allowed for the proper "flow" in production and easily facilitated changes which came as a result of research, the making of new products or the installation of higher speed machinery. Progress in fluorescent lighting and air conditioning made the design of windowless factory buildings practicable. Under the consideration of blackouts, night shifts and the effects from solar radiation through glass areas, this type had many advantages to offset its increased initial expense.

In the design of housing for the workers (*see* HOUSING) the requirement of low cost was mandatory with the insistence that the rent to the occupant be kept within a reasonable percentage of his earnings (not more than one-fifth). In American defense housing, the cost per family unit was substantially below that of similar units built during the war of 1914–18. Savings were achieved without loss of comfort by cheaper and more efficient construction, the elimination of all unessential features, a paring down of the spaces to minimums established for decent living, and the omission of wasteful attics, cellars or rooms for dining. Labour costs were reduced by the use of mass production methods, standardization and prefabrication. To provide the dwellings in as short a time as possible and to avoid "ghost towns" after the war, the government established three classifications of defense housing: permanent, demountable and portable.

In general, a greater concern over the problems of town and regional planning was shown. In Great Britain, this found expression in the formulation of policies for postwar reconstruction. In America, building programs were prepared as a "work reserve" for the period of demobilization. In both places, further need for a central planning authority was indicated.

Materials and Methods.—The shortage of building materials was particularly felt in the metals, where the difficulty of obtaining steel had far-reaching consequences. Aluminum was completely unavailable for building purposes and difficulties were encountered in the procurement of tin, brass, copper and the alloys. To deal with these shortages, governmental regulations allowed building only wherever necessary for defense or essential to the health and safety of the people. In Great Britain, special authori-

zation was required for building operations costing more than £100. The Department of Scientific and Industrial Research, London, issued bulletins dealing with wartime construction methods as affected by fire risks, the vulnerability of glazing under aerial bombardment, the provision of adequate lighting in working spaces combined with methods for blackouts, and the shortages of materials; in all recommended procedures, an attempt was made to maintain comfort at the normal level.

In the United States, a general priorities plan was worked out by the Office of Production Management of the national government to provide materials for essential construction. To accomplish this, a priority rating was required for the purchase of critical building materials. No private residential building was considered acceptable for priority if costing more than $6,000 per family unit or demanding rent of more than $50 per month. The feature of demountability, which was adopted for houses and schools in communities to be dismantled after the emergency, gave prefabrication a long-awaited opportunity. The shortage in steel increased the structural use of wood in America, and caused its revival as a building material for the construction of industrial buildings. Larger spans of lighter sections worked into trusses or lamella (lattice-type) roofs became characteristic of modern wood construction in opposition to the heavier beams and short spans of the older mill-type construction.

Among the materials which were outstanding in the progress of their development were glass and plywood. Both played an important role in that phase of progress in architectural design which grew out of technological changes. The use of glass blocks increased. Sheets of glass rendered unbreakable by heat treatment found popular appeal, particularly in store entrances where they permitted the elimination of supporting and enframing members and thereby gave increased vision.

With the development of two-directional bending of plywood for aeroplane construction came suggestions for the application of the new opportunities thus gained, in architecture and interior design. A chair was developed by Saarinen and Eames, which was moulded out of plywood to fit the human form. The 40-year-old method of plywood production in the United States saw the perfection of lathes capable of unwinding a continuous veneer 16 ft. wide and $\frac{1}{8}$ in. thick and a mile in length from an average 6 ft. diameter "peeler" log. The discovery of new types of glues and of synthetic resin bonding agents further improved the quality of plywood and lowered its cost.

Plastics came into wider use for all types of building accessories, hardware and lighting fixtures.

A system of providing comfort by radiating heat at a lower temperature from labyrinths of pipes within the floors or ceilings of rooms gained further acceptance in the United States, where fluctuations of extremes of temperature had hitherto prevented the ready appeal of this method. In keeping with the need for low-cost housing, new types of heating apparatus, economical both as to the use of space and the initial as well as operation cost, were manufactured.

Examples of Recent Architecture.—In England, according to an official statement from the ministry of works and buildings, more than 200 firms of architects in private practice, employing upward of 650 technical assistants, were engaged in the construction of hospitals, hostels, camps, stores, etc. In addition, panels which contained the names of more than 350 firms of architects were drawn upon for the development of air-raid shelter schemes and government buildings, to report on air-raid damage and advise on the precautions to be taken for the safeguarding of historic buildings. The design of shelters for protection from air raids was approached from a scientific basis, taking into account the destructive effect of bombs, standards necessary for the preservation of morale, the cost, and the distribution of shelters with regard to accessibility. Bomb-proof shelters were advocated by Tecton, architects, in the forms of cylinders built downward into the earth with several stories arranged in spiral fashion. (*See* also AIR RAID SHELTERS.)

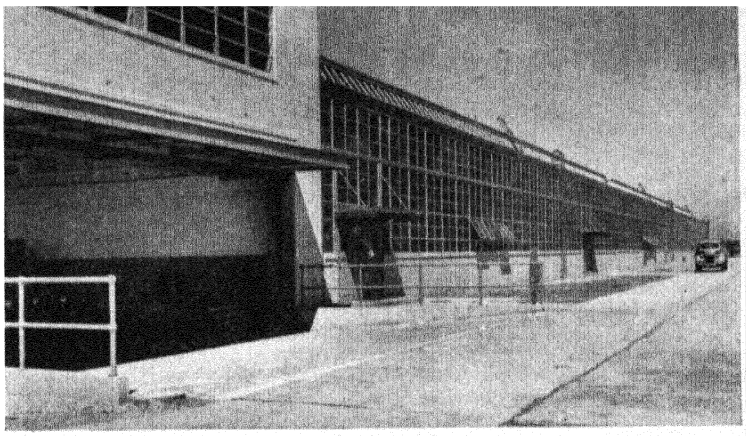
In the United States, construction contracts for 1941 indicated the largest volume of building for any year since 1929. The types of buildings which constituted this volume were primarily in the fields of military construction, industrial building and housing for defense workers. Buildings which in normal times occupied the majority of architects had declined in volume.

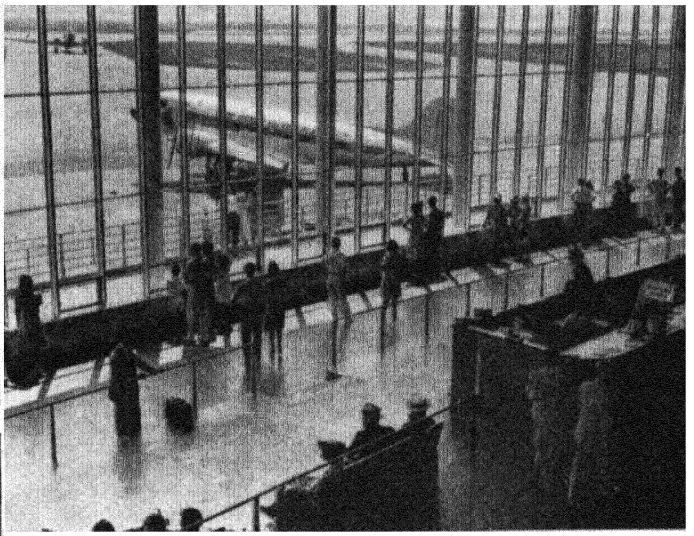
A few examples of civilian architecture, unaffected by the war, were completed. Kleinhans Music hall, Buffalo, N.Y., F. J. and W. A. Kidd, architects, Eliel Saarinen, associate, echoed that type of design in which interest in form and the texture of material were supplemented by a decorative treatment of the surfaces. In the arrangement of the architectural masses the curved shapes of two music halls (dedicated to chamber music and orchestral performances) were brought into interesting interplay. The walls, both inside and out, were enriched by geometric patterns obtained through the jointing of the stone and plywood used for the panelled walls. In the design for the Washington airport building, Howard L. Cheney, consulting architect, the symmetry about the central axis and the classic proportion of the principal motives of the façades, showed in a dominant central portion the continuing popularity of traditional architecture. In contrast, the hangars of this airport, with their undecorated functional use of curved steel trusses, expressed modern functionalism which in part was also discernible in the broad ribbons of glass of the wings of the airport building. The Crow Island school at Winnetka, Ill., Eliel and Eero Saarinen, designers, was built of glass and brick in a modern design; the unusual plan produced in addition to a maximum of natural light for the classrooms and lobby an unusually cheerful atmosphere. In this building, it was shown that recent modern architecture had departed from the boxlike starkness by which it was characterized when it first appeared in Europe.

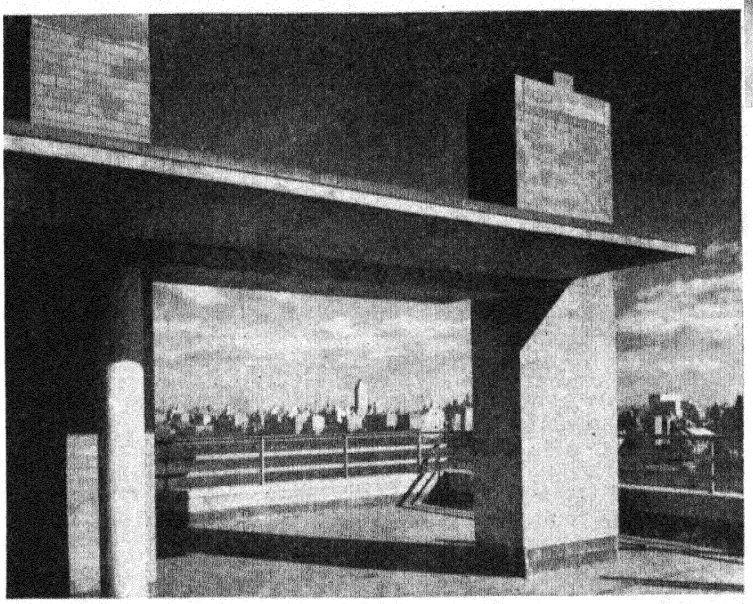
Regional characteristics of modern residential architecture found their expression on the west coast in the work of the architects of Los Angeles and San Francisco, on the east coast by the architects of New York, Boston, Philadelphia and Washington, and in the midwest, in Chicago. Among these, the work of Edward D. Stone of New York showed a use of glass which allowed for an uninterrupted visual combination of the outdoors with the inner spaces. It also demonstrated that modern architecture could express in designs the characteristics of the individuals for whom they were intended, instead of being impersonal statements of the dogmas of a style.

Many factories were built of unprecedented size with unusual rapidity. Opinions were divided on the use of natural lighting. The Ford factory at Dearborn, Mich., Giffels & Vallet, Inc. and L. Rossetti, architects, was an example of windowless construction. Speed of construction was demonstrated in the building of a 380,000 sq.ft. propeller plant for the Curtiss-Wright corporation at Caldwell, N.J., Albert Kahn, Inc., architects, which was ready for operation within 68 working days from the beginning of excavation.

The housing project at Indian Head, Md. was devoted to experimentation with and demonstration of prefabrication for residential buildings. Although most houses kept the traditional appearance typified by sloping roofs and the application of some ornamental features to satisfy popular demand, they varied substantially in their systems of construction. At Grand Prairie, Tex. it was demonstrated that an entire building could be erected and completed on the site within one day. Houses of cylindrical and







Above, left: PROPELLER PLANT of the Curtiss-Wright corporation at Caldwell, N.J., completed in 68 days in 1941; Albert Kahn, architect

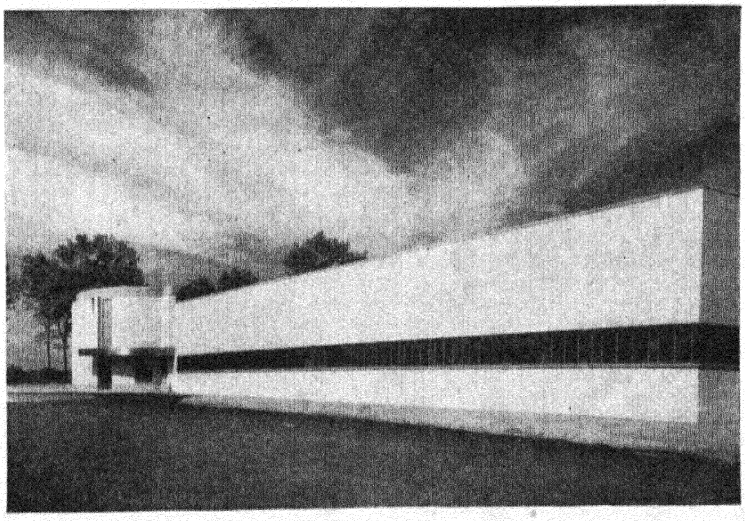
Above, right: BALCONY of the Washington, D.C., airport's administration building, opened June 16, 1941; Howard L. Cheney, consulting architect

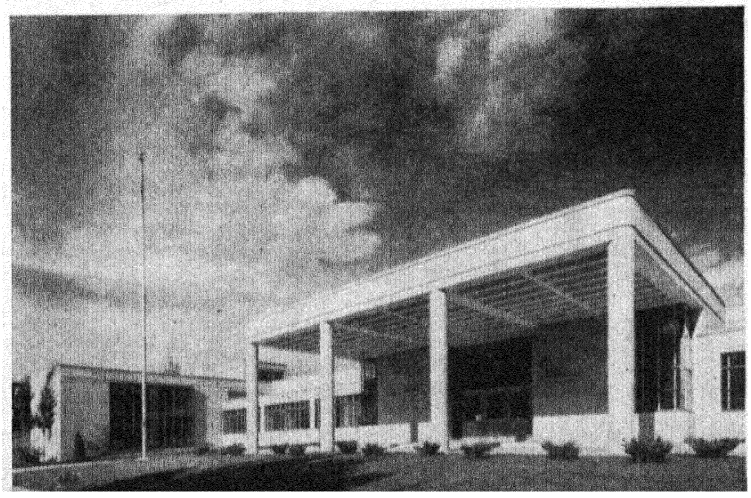
Upper centre: ROOF TERRACE of apartment building at 240 Central Park South, New York city; Albert Mayer, architect

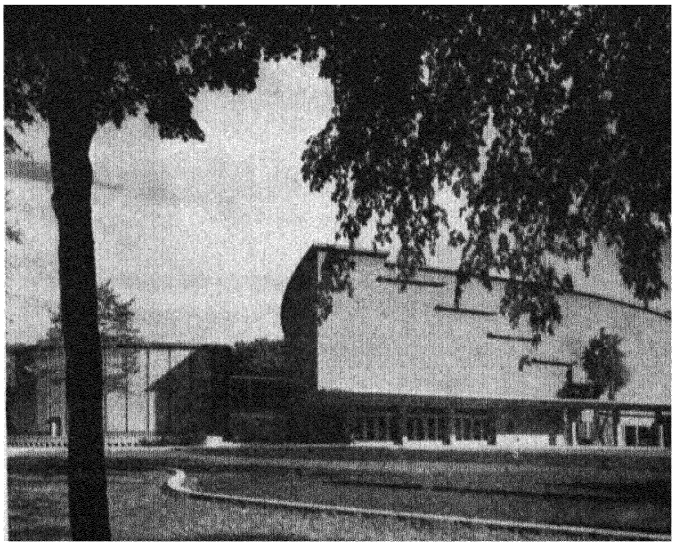
Lower centre: PLANT of Industrial Tape corporation, New Brunswick, N.J.; R. G. and W. M. Cory, architects

Below, left: ENTRANCE of the School for Crippled Children, Denver, Colo.; Burnham Hoyt, architect

Below, right: KLEINHANS MUSIC HALL, Buffalo, N.Y.; F. J. and W. A. Kidd, architects, and Eliel Saarinen, associate







domed forms were proposed as answers to the problems of low-cost housing and prefabrication. Buckminster Fuller demonstrated the conversion of a mass produced steel grain bin into a demountable house. A number of dome-shaped residences designed by Wallace A., Neff, architect, were built at Falls Church, Va., by spraying concrete (Gunite) over inflated balloons. Thirty thousand dwelling units, out of an estimated demand of 300,000 for workers in defense industries, were designed by independent practising architects under the direction of the division of defense housing of the Federal Works authority. The size of the projects ranged from 20 to 1,690 family units. Row houses and single family buildings, with flat or sloping roofs, were typical of these. At Vallejo, Calif. the largest project, William Wurster, architect, interesting methods of mass production and assembly were applied. Also other government agencies, such as the Federal Security administration and the Public Building administration, were greatly active in this field. (*See* BUILDING AND BUILDING INDUSTRY.)

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Archives, National.

This institution, created by act of congress in 1934 and administered by the archivist of the United States, has as its primary purposes the concentration and preservation in the National Archives building of such noncurrent records of the government of the United States as have permanent value and their administration so as to facilitate their use for governmental or research purposes.

Because of its services during the emergency of 1941, the National Archives was designated in Oct. 1941 as one of the national defense agencies of the government. More than half of the 81,000 cu.ft. of records transferred to the National Archives during the fiscal year 1941 came from the war and navy departments and other defense agencies, and the total of 330,000 cu.ft. of material in its custody included many records of World War I that were especially useful to defense agencies seeking information concerning that war. Chiefly as a result of this use, the number of requests for services on records received during the year exceeded in number those received during the two preceding years combined.

The Franklin D. Roosevelt library at Hyde Park, N.Y., which is also administered by the archivist, was dedicated on June 30, 1941. The museum portions of the building, opened to the public on that day, were visited by nearly 30,000 persons by Sept. 30.

Solon J. Buck took office as archivist of the United States on Sept. 18, 1941, succeeding Dr. R. D. W. Connor, the first archivist, who resigned to accept a newly endowed professorship at the University of North Carolina. (S. J. BU.)

Arctic Exploration: *see* EXPLORATION AND DISCOVERY.

Areas and Populations of the Countries of the World.

The table that follows gives the latest available figures for the area in square miles, the population in thousands and the population per square mile of the different countries of the world.

Name of State	*Area* (in Square Miles)	*Population* (000's omitted)	*Population per Square Mile*
Afghanistan	250,900	10,000	39.9
Albania	10,800	1,063	98.4
Andorra	191	6	31.4
Argentina	1,079,965	13,130	12.2
Australia, Commonwealth of	3,157,936	7,984	2.5
Belgian colonial empire	930,887	14,140	15.2
Belgium	11,775	8,396	713.0
Bohemia-Moravia, Protectorate of (as of March 1939) (Czecho-Slovakia)	18,914	6,794	359.2
Bolivia (adjusted area)	420,740	3,350	8.0
Brazil	3,285,246	44,116	13.4
British colonial empire	3,713,029	70,725	19.0
Bulgaria	39,825	6,305	158.3
Burma	261,610	16,119	61.6
Canada	3,694,863	11,301	3.1
Chile	286,396	4,684	16.4
China, total	4,480,992	457,836	102.2
China Proper	2,903,475	422,708	145.6
Manchuria (excl. of Kwantung)	482,440	29,328	60.8
Mongolia	625,783	2,078	3.3
Tibet	469,294	3,722	7.9
Colombia	439,997	8,702	19.8
Costa Rica	23,000	639	27.8
Cuba	44,144	4,253	96.3
Danzig (as of Sept. 1, 1939)	754	405	537.1
Denmark (exclusive of Greenland)	16,598	3,825	230.4
Dominican Republic	19,326	1,656	85.7
Ecuador (excl. of uninhabited territory)	175,630	3,200	18.2
Egypt (excl. of uninhabited territory)	383,000	16,522	43.1
Estonia	18,533	1,134	61.2
Finland	147,811	3,800	25.7
France	212,659	41,980	197.4
French colonial empire	4,687,336	71,174	15.2
Germany (as of May 1939. Incl. Memel)	226,196	79,364	350.9
Great Britain and Northern Ireland, United Kingdom of	94,279	47,745	506.4
Greece	50,147	7,108	141.7
Guatemala	45,452	3,284	72.3
Haiti	10,204	3,000	294.0
Honduras	46,332	1,106	23.9
Hungary (as of April 1939)	40,530	10,186	251.3
Iceland	39,709	120	3.0
India (exclusive of Burma)	1,575,187	362,828	230.3
Iran (Persia)	634,360	15,000	23.6
Iraq	116,600	3,700	31.7
Ireland (Eire)	26,601	2,968	111.6
Italian colonial empire	1,346,415	13,129	9.8
Italy	119,764	43,993	367.3
Japan	147,702	72,876	493.4
Japanese empire	115,321	31,762	275.4
Latvia	25,395	1,951	76.8
Liberia	46,000	2,500	54.3
Liechtenstein	65	12	184.6
Lithuania (exclusive of Memel)	22,959	2,879	125.4
Luxembourg	1,000	301	301.0
Mexico	763,944	19,546	25.6
Monaco	0.59	24	40,678.0
Netherlands	13,203	8,865	671.4
Netherlands colonial empire	789,962	67,719	88.3
Newfoundland and Labrador	152,734	296	1.9
New Zealand	104,751	1,700	16.2
Nicaragua	49,000	1,172	23.9
Norway (including Svalbard)	148,850	2,952	19.8
Oman and Muscat	80,000	500	6.3
Panama (exclusive of Canal Zone)	28,950	548	18.9
Paraguay (area adjusted)	154,165	955	6.2
Peru (revised areas)	482,258	7,200	14.9
Poland	150,470	35,090	233.2
Portugal (incl. Azores and Madeira Isls.)	35,490	7,539	212.4
Portuguese colonial empire	803,638	9,460	11.8
Rumania	113,919	20,045	176.0
Salvador	13,176	1,745	132.4
San Marino	38	14	368.4
Saudi Arabia	800,000	4,500	5.6
Slovakia	18,914	2,691	142.3
South Africa, Union of	472,550	10,341	21.9
Spain	194,208	25,975	133.7
Spanish colonial empire	128,696	1,005	7.8
Sweden	173,347	6,341	36.6
Switzerland	15,944	4,216	264.4
Thailand (Siam)	200,148	15,718	78.5
Turkey	300,214	17,870	59.5
United States	3,022,387	131,670	43.6
United States territories and possessions	712,822	18,952	26.6
Uruguay	72,153	2,147	29.8
U.S.S.R	8,176,000	170,467	20.8
Vatican City	0.17	1	5,882.4
Venezuela	352,123	3,615	10.3
Yemen	75,000	3,500	46.7
Yugoslavia	95,576	15,703	164.3
World Totals	51,237,706	2,159,133	42.1

Argentina. A republic on the Atlantic coast of southern South America and second largest country of the continent; language Spanish; Capital, Buenos Aires; President, Dr. Roberto M. Ortiz (acting president, Dr. Ramón Castillo). The area is 1,079,965 sq.mi., slightly over a third of that of the United States. The religion is Roman Catholic.

No official census has been taken since 1914, but official estimates placed the population at 13,318,320 as of Dec. 31, 1940. No other American country except Canada has as large a proportion of whites. Native-born persons of European stock aggregated 76·9%, mixed bloods 3·2% and foreign-born (almost entirely European) 19·9%. A majority of the population is of pure Spanish stock, nearly a third is Italian or part-Italian, and an estimated 250,000 are German or part-German. Buenos Aires had a population of 2,515,729 (1941 municipal census), or 3,700,000 with its suburbs. Other cities (with est. pop.) include: Rosario (513,000); Avellaneda (suburb of Buenos Aires) (386,000); La Plata (248,000); Córdoba (213,000); Santa Fé (147,000); Tucumán (147,000); Bahía Blanca (115,000); Mendoza (82,000); Paraná (72,000). In 1916–41, cities and villages of 1,000 or more inhabitants increased their total population by 108% and aggregated 75% of the whole in 1941, while the rural population remained stationary. Around 45% of the population lives in Buenos Aires province and in the Federal District (the city of Buenos Aires).

Government is federal in form, with legislative power vested in a bicameral congress. There are 14 provinces, a federal district and 10 territories. The constitution is modelled broadly on that of the United States. The provinces, however, have in general less autonomy than do the individual North American states.

History.—Argentine history in 1941 was marked by sharp internal political conflict, by serious international frictions, notably in regard to nazi propaganda activities, and in general by a closer relationship with the rest of the Americas. In short, Argentine development during the year followed the general course of world events, which vitally affected it, but policies and procedure were conditioned by domestic political considerations.

Domestic politics played an important role. With a Conservative acting-president and a chamber of deputies controlled by the opposition Radical (*i.e.*, Liberal) party, the year was marked by almost constant political strife. Tension increased as the year wore on, and lessened only with the adjournment of congress in October.

Much of the political confusion arose from the continued illness of President Ortiz, who, prior to withdrawing in favour of Vice-President Ramón Castillo in July 1940, had enforced a policy of fair elections. Under Ortiz, the Radical party, after wandering in a political wilderness since 1930, had gained control of the lower house of congress and several provincial governments. Neutral observers conceded that the Radical party had the confidence of the country, and for this reason the party demanded annulment of fraudulent provincial elections in Mendoza (Dec. 15, 1940) and Santa Fé (Jan. 5, 1941). The Radical party adopted an obstructive policy in congress and refused to pass essential legislation, hoping thus to force free-election pledges from Acting-Pres. Castillo. By May only a handful of bills had been acted upon, no budget for the year had been approved, and no ratification made of the $100,000,000 U.S. Export-Import bank loan to Argentina. When Castillo by executive decree extended the 1940 budget and declared his intention of governing by decree if necessary, the Radical deputies terminated their boycott (May 6). Meanwhile, in January, two outstanding cabinet members likewise resigned, reportedly in protest against Castillo's election policy—Foreign Minister Julio A. Roca (vice-president from 1932 to 1938) and Finance Minister Federico Pinedo.

Amid this heavily charged atmosphere came another serious problem—that of nazi and fascist propaganda and other activity in Argentina. Charges of totalitarian propaganda in the army and of subversive activities in other quarters were aired in congress in June. In response to a formal congressional demand, Interior Minister Culaciatti officially admitted intense nazi activities in many directions but denied their importance (June 18). The chamber of deputies thereupon named a committee, headed by Deputy Rául Damonte Taborda, to investigate "activities contrary to the institutions and sovereignty of the Argentine Republic." The Damonte committee, although denied administrative and police aid, made a sweeping investigation, and during late August and September presented a series of reports with startling disclosures. It formally charged that the nazi party, although formally dissolved by presidential decree of May 15, 1939, still existed with an organization on military lines throughout Argentina, with the German ambassador directing its activities. German embassy expenditures, it was shown, were 36 times as great (5,983,000 pesos) in the year ending June 30, 1941 as in 1938–39; 500,000 pesos in bearer checks had been issued in a single week, part to the nazi propaganda organ *El Pampero;* the German news agency *Transocean* was disclosed to be purely a subsidized propaganda vehicle. Evidence was given, too, of active axis agents among German schools in the Argentine, of German control of 2,000,000,000 pesos of Argentine business through nazi conquests in Europe, a regular system of assessment of Germans resident in the Argentine, and presence of at least 60,000 nazis in Buenos Aires alone. At the same time, there was revealed the existence of strategically located German groups, not only in Argentine areas such as Patagonia and Misiones territory (the northernmost finger of Argentina), but in other South American countries as well. (*See* BRAZIL; HISPANIC AMERICA AND WORLD WAR II.)

The chamber of deputies quickly passed, by a vote of 88 to 1, a resolution declaring German Ambassador Baron Edmund von Thermann *persona non grata* and demanding his expulsion. Von Thermann himself refused to withdraw, and in September, Acting-Pres. Castillo formally "dissociated" his administration from the congressional demand, an act recalling Pres. Irigoyen's flat disregard, in 1917, of a similar congressional resolution after disclosure of German anti-Argentine activity.

Indicative of the administration's unwillingness to antagonize the axis powers was its cautious, legalistic policy toward axis shipping in Argentine harbours. Refusing to follow the lead of the United States, in seizing axis and axis-controlled ships, the government entered into negotiations with Italy and—after long delay—purchased 16 Italian ships totalling 88,000 gross tons. These were made the nucleus of a state-owned merchant marine.

Meanwhile, Argentina had moved toward a hemisphere economy, taking steps in the direction of a qualified Pan Americanism, notably by ratification, in July, of the Havana conference pacts by unanimous vote of both houses of congress. As a result of the Río de la Plata regional conference in Jan. 1941, a treaty was signed with Brazil (Nov. 21) providing reciprocal progressive reduction of duties on non-competitive commodities, tariff exemption of new industrial products, and improvement of communications between the two countries. Other trade pacts were made with Bolivia and Cuba, and negotiations were started with Chile, Paraguay and Uruguay.

Most important of all trade agreements, however, because of its dual political and economic implication, was one with the United States, signed on Oct. 14 after long and protracted negotiations. Under this agreement, tariff duties on 84 items, which accounted for 93% of Argentina's 1938 and 1939 exports to the United States, were cut roughly 50%, while Argentina reduced her duties

on a variety of United States exports by 25% to 50%. The most important Argentine commodities affected were canned meat, wool, hides, linseed and casein. Although the status of Argentine fresh meat was unchanged—its importation into the United States having been banned since 1927 on grounds regarded by Argentina as not only flimsy but gratuitously insulting—the general effect of the agreement was to remove a major impediment to hemispheric solidarity. Meanwhile, a British contract was made for 500,000 tons of Argentine beef (the entire exportable surplus) in the year ending Oct. 1942. Similar large-scale cotton and grain contracts were made with Spain (*see* SPAIN).

Conflicting territorial claims in the Antarctic continued to be an issue with Chile; parleys on the subject, although amicable, were without concrete result. Spread of World War II to the Americas raised another question with Chile—revision of an 1881 treaty forbidding fortification of Magellan strait (*see* CHILE). Argentine claims to the Falkland islands were likewise aired during the year, but with much less fervour than in the past.

Late in September the political situation was suddenly obscured by sudden infantry occupation of military airports and grounding of all army planes in what was widely reported to be suppression of a nascent plot. This, and the president's sudden removal of the entire municipal council of Buenos Aires, accentuated the friction between Castillo and the Radicals. The Radicals refused to pass important financial measures until Pres. Castillo promised to permit free provincial elections in December. Castillo remained adamant, however, and congress adjourned with the breach still wide. The elections resulted in the expected Conservative victory. Public attention, however, was diverted by the outbreak of inter-hemisphere hostilities.

Japan's attack on the United States came as a hard shock to Argentina's complacent neutrality. Pres. Castillo promptly declared that the United States would not be treated as a belligerent, and on Dec. 16 put Argentina in a formal state of siege, with a suspension of constitutional guarantees. Newspapers were forbidden to print anything "affecting the neutrality of the Argentine nation" or against the government, political regime, head of state, or officials of any belligerent nation. Demonstrations, whether pro- or anti-axis, were forbidden, and permission for a mass meeting to pay homage to Pres. Roosevelt was refused. Press and public opinion, however, were so strongly and openly anti-axis that Pres. Castillo recalled the Argentine ambassador to Germany "for consultation," and, on Dec. 31, made a formal declaration of Argentine solidarity with the United States.

Education.—Education is free and compulsory. In 1940 there were 13,615 elementary schools, with 1,929,818 enrolment; 6,463 of these (enrolment: 927,580) were under complete federal control, the remainder under provincial, with federal support, however. An additional 1,167 private schools (as of 1939) had an enrolment of 139,917. Secondary schools of all types numbered 445, and had 75,903 pupils. Six national and one private universities had enrolments aggregating nearly 30,000.

Defense.—Military or naval service is compulsory. The standing army in 1941 was estimated at 45,000, with potential reserves of 281,000. Modern equipment was almost entirely lacking. The navy comprised 2 battleships, 3 cruisers, 16 destroyers and 3 submarines. Air strength was around 300 planes. A military mission was sent to the United States late in 1941 to make extensive purchases of needed materials. A five-year rearmament plan allotting 712,000,000 pesos for naval and 646,000,000 for military expansion was approved by congress in October. Lend-lease aid from the United States approximating $70,000,000 was reported to have been made.

Finance.—The monetary unit, the peso, had an official exchange value of 26.8 cents U.S. and an unofficial rate of approximately 23¾ cents U.S. in 1941. Budget estimates for 1942 called for an expenditure of 1,600,000,000 pesos (a 46,246,000 peso increase). A 1941 deficit well in excess of early estimates of 150,000,000 pesos was expected. Government revenues are largely from customs duties. Income tax rates reach a maximum of 7% at 250,000 pesos.

The public debt on June 30, 1940 totalled 7,724,535,000 pesos (national, 5,291,382,000 pesos; provincial, 1,584,408,000; municipal, 848,745,000), of which 1,952,998,000 pesos, including $190,500,000 in U.S. dollar bonds, were internal. Argentine credit was the highest of any Hispanic American republic in 1941. In Nov. 1941, approximately 2,500,000,000 pesos of 5% internal bonds were converted at 4%.

Foreign Trade.—Argentine imports in 1940 totalled 1,498,757,000 pesos, a 12% gain over 1939; exports were 1,427,933,000 pesos, a 9.2% decline. The United States supplied 29.1% of all imports (1939: 17.2%), Great Britain 19.8% (19.9%), Brazil 7.8% (6.5%), Curaçao 4.9% (4.0%), British India 4.3% (3.9%), Peru 3.9% (4.0%), France 3.1% (5.6%), Belgium 2.8% (6.5%), British Asia (except India) 2.4% (2.2%), Canada 2.3% (1.2%). Great Britain took 36.4% of all exports (1939: 35.9%), United States 17.5% (12%), France 5.8% (4.9%), Brazil 5.3% (4.3%), Spain 3.9% (1.9%), Netherlands 3.7% (8.1%), Italy 3.4% (2.1%), Belgium 2.5% (7.1%), Uruguay 1.7% (1%), Japan 1.5% (0.7%), Sweden 1.4% (2.1%).

The principal imports in 1940 were: fuels and lubricants, 17.5%; textiles, 17.4%; machinery and vehicles, 9.9%; iron and iron goods, 9.2%; chemicals, pharmaceuticals, etc., 8.5%; foodstuffs, 7.2%; metal goods (except iron), 6%; paper goods, 5.8%. Proportions varied only slightly from those of 1939. The principal exports were, by value: wheat 19.9% (1939: 17.5%), chilled and frozen beef 13.1% (13.2%); unwashed wool 8.4% (7.6%), linseed 8.4% (10.8%), hides 7.1% (6.3%), maize 6% (12.9%), washed wool 8.4% (2%), canned meats 3.1% (3.2%), chilled and frozen mutton 2.9% (2.2%), quebracho extract 2.1% (2.7%). While export totals were the lowest, with one exception, in ten years, eight of the ten leading commodities increased in average unit price. The tonnage of cereal exports in 1940 was: wheat, 3,646,603 (1939: 4,745,944), maize 1,874,463 (3,196,073), linseed 752,191 (1,183,203), oats 223,382 (359,791), barley 388,867 (194,851), rye 166,414 (194,851), birdseed 9,255 (6,877). Meat exports totalled 562,658 tons (1939: 669,300 tons), hides 131,450 tons (147,556 tons), sheepskins 11,815 tons (15,518 tons), washed wool 25,146 tons (17,471 tons), unwashed wool 99,027 tons (122,691 tons). Quebracho extract exports were 121,375 tons (1939: 195,863 tons), logs 21,853 tons (74,948 tons). Fresh fruit exports declined from 52,700 tons in 1939 to 24,500 in 1940.

In the first nine months of 1941, imports declined 25.6%, with the United States supplying 27.8% of the total, Great Britain 18.7%, Brazil 12.8%, Peru 5.8%, India 5%, Curaçao 4.8%, Japan 3.6%, Canada 3.3%. Exports were 7.1% less in value, 40.9% less in volume. The United States took 36% of total values (14% in the same period of 1940), Great Britain 32.7%, Brazil 5.8%, Spain 4.6%, Japan 3.5%, Uruguay 1.9%, Chile 1.8%, Bolivia 1.5%, Switzerland 1.2%, Paraguay 1%. The decline in volume was due almost entirely to reduced grain and linseed exports, above all of maize, which was one-fifth the 1940 total. Wool tonnage rose 52%, hides 22%, meat 4.7%, dairy products 80.8%. Most of the declines were registered early in the year; by August, however, the downward trend had been reversed, and export values for the first 10 months were off only 3.5%, export volume about 37½%, while imports were up to 75% of 1940 values.

Communication.—The greater part of Argentine external commerce is handled through Buenos Aires, which is served by numerous steamship lines and is the hub of the country's railway system. Rosario, on the Paraná, however, handles more wheat and maize tonnage than does Buenos Aires. Bahía Blanca, to the south, is also an important cattle and grain port. Comodoro Rivadavia, in southern Patagonia, is the centre of the petroleum industry.

Argentina has the most extensive railway system in Latin America. The country is linked by rail with Bolivia, Paraguay and Uruguay, and by rail and bus with Chile (through the Transandine railway route and Bariloche in the south). In 1941, 42,112 km. of railways (12,702 km. state-owned) were in operation. Government policy is to extend the state railway system. The Transandine railway, purchased in 1940, was under reconstruction, and unsuccessful negotiations were carried on for acquisition of the six British-owned lines, operating 59% of all mileage and representing an investment of around $627,000,000. An Argentine government-financed rail line into the Bolivian oil-fields was in process of construction by agreement with Bolivia in 1941. During 1941 work was accelerated on the Salta-Antofagasta railway, in construction since 1921. A 6,500,000-peso annual expenditure until 1946 was expected to carry the line to the Chilean frontier at Socompa.

Air transport by Pan American airways provides extensive service to all parts of America, with almost daily connections to Chile and Brazil. The Italian "LATI" line began service from Europe (via Brazil) on July 30, but a gasoline boycott compelled cessation in December. State-operated air routes aggregated some 10,000 km. in 1941, and plans for further extension, including lines to Bolivia and Paraguay, Uruguay, and Brazil, were announced Sept. 19. A private aviation training school was opened near Buenos Aires early in 1941. There were 22 glider clubs, with 32 gliders and 1,000 members in 1941.

The Argentine merchant marine aggregated some 300,000 gross tons in 1941, most of it state-owned. Under war conditions, strenuous efforts at further expansion were made.

In 1941 there were 308,248 km. of roads of all types, with 55,403 km. additional under construction. Approximately 65,000 km. were national, although the federal government contributes toward provincial highway development as well. Maintenance is chiefly through a gasoline tax, with annual expenditures around 100,000,000 pesos (101,715,000 in 1941). Although highway mileage was greatly expanded after 1930, the number of automobiles declined from 435,822 to 423,942 in 1939, because of import restrictions, with an increased age of cars in actual service from 7.5 to 11.9 years.

Agriculture.—Argentina's resources are principally agricultural and pastoral, with 10.8% (74,130,000 ac.) and 44.4% (306,404,000 ac.), respectively, of the country's area devoted to them in 1941. Together they account for well over 90% of all export values.

The chief agricultural products are cereals and linseed. In 1941–42 the area devoted to principal crops (in hectares; 1 hect. = 2.471 ac.) was: wheat, 7,190,000; maize (1940–41), 6,097,600; linseed, 2,733,000; oats, 1,440,000; barley, 702,000; rye, 947,000; birdseed, 54,000; rice (1940–41), 30,500; sugar cane (1939–40), 188,714; vineyards (1939–40), 137,934; cotton (1940–41), 336,600; sunflower seed (1940–41), 530,000; alfalfa (1939–40), 5,402,400; potatoes (1940–41), 241,800. Total cereal and linseed acreage was 4.4% less than in 1940, despite an increase in wheat. Tonnage produced was: wheat 7,380,200; linseed 1,459,600; maize 10,450,000; oats 539,500; barley 789,000; rye 212,200; sugar cane 5,835,075 (1939–40); cotton 154,794; sunflower seed, 370,000; rice 57,000 (11,089 tons imported in 1940); potatoes 1,053,000; grapes 953,866 (1939–40). In 1940, 1,455,725 tons of wheat, 539,443 of sugar and 6,706,804 of grapes were processed, nearly all for domestic consumption.

Official estimates as of June 30, 1938 showed a total of 45,916,768 sheep, 34,317,663 cattle, 8,262,057 horses, 4,760,755 goats, 3,381,439 swine and 791,199 asses and mules in Argentina. During 1940, 6,983,694 cattle, 7,518,169 sheep and 1,176,469 hogs were slaughtered, of which 2,120,877 cattle, 4,582,452 sheep and 169,186 hogs were for export. Official 1940 production estimates were: 7,800,000 cowhides, 11,100,000 sheepskins, 176,000 tons of wool.

The dairy industry was increasing in importance in 1941. Production in 1939 was 34,248 tons of butter, 51,065 tons of cheese and 20,781 tons of casein.

Some 9,208 tons of eggs were exported. The small fishing industry was being expanded in 1941.

Forestry.—Timber is limited except in the subtropical north, where quebracho, source of tannin, and yerba mate (Paraguay tea) are well developed, the latter for domestic consumption as well as export. Argentina normally produces most of the world supply of both.

Manufacturing.—Manufacturing underwent extensive development after 1935.

Comparative figures from the 1939 and 1935 industrial censuses showed a 32.7% increase in the number of establishments (to 53,866) and 30.4% in number of employees (to 618,606). Subsequently, a probably much greater increase took place. The chief production is in foodstuffs, textiles, forestal products, paper, printing and chemicals and pharmaceuticals. Practically all manufacturing is for domestic consumption.

Mineral Production.—Argentina ranked 11th in the world production of petroleum in 1941. In 1940 petroleum production, 3,276,496 metric tons, was 10.7% greater than in 1939.

Approximately 60% came from state-owned wells. The first nine months of 1941 showed a further increase of 10.67%. Some 75% came from the Comodoro Rivadavia fields in Chubut territory (in southern Patagonia), the rest from Neuquén territory and Salta and Mendoza provinces, along the Andean foothills.

During 1940 mining advanced considerably, as axis buyers acquired control of some 50% of the tungsten and mica output, the only metals produced regularly. Some beryllium, lead concentrates, tartarate of lime and borax are exported irregularly. In 1941 Japanese control of the tungsten supply was thwarted by a United States purchase agreement with the Argentine government. (L. W. Be.)

Arizona.

The "Apache state" lies in the southwestern part of the United States of America. It borders Mexico on the south; the Colorado river forms most of the western boundary.

Arizona and New Mexico are the youngest of the United States, both being admitted in 1912. By federal census of 1940, the area is 113,580 sq.mi.; pop. 499,261, 65.2% rural and 34.8% urban. Native and foreign-born whites (including Mexicans) numbered 389,955 and 36,837 respectively; Negroes, 14,993; other races (mostly Indians), 57,476.

The capital is Phoenix with a population of 65,414. Chief cities are: Tucson (36,818); Douglas (8,623); Mesa (7,224); Globe (6,141); Prescott (6,018); Bisbee (5,853); Yuma (5,325) and Flagstaff (5,080).

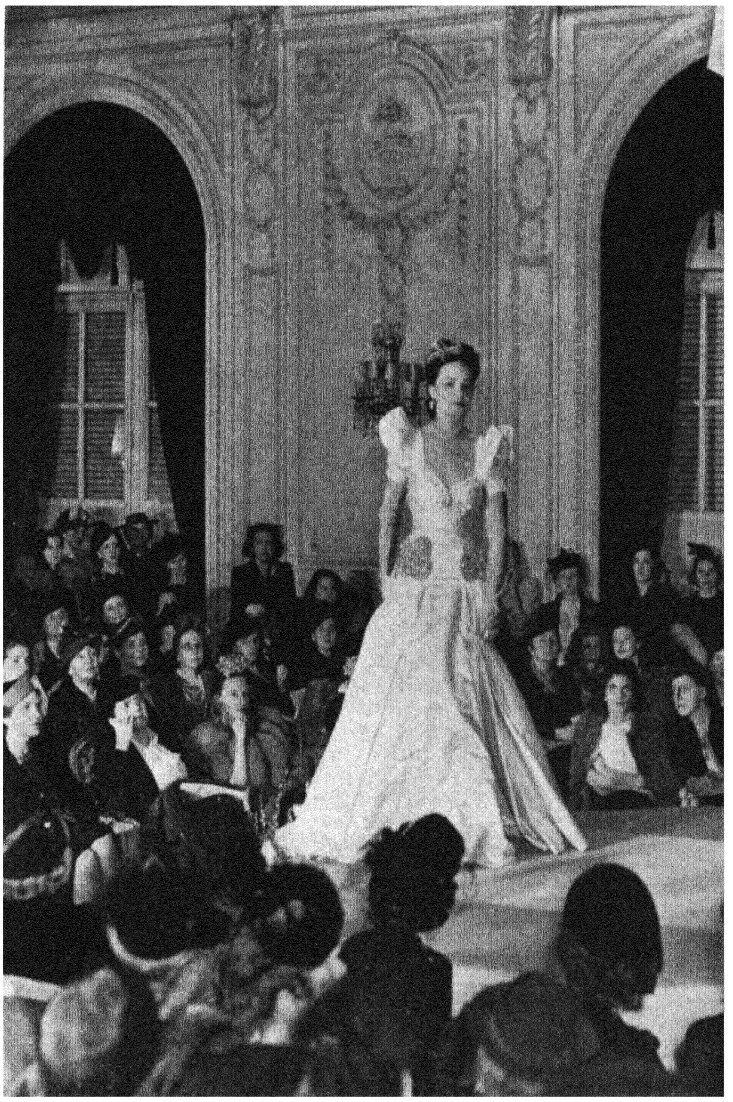
History.—The state officials in 1941 were: chief justice, Alfred C. Lockwood; governor, Sidney P. Osborn; secretary of state, Harry P. Moore; attorney-general, Joe Conway; treasurer, Joe Hunt. Governor Osborn in 1941 proposed the consolidation of bureaus and offices, a new board of control for the state hospital, and an increase of old-age pensions from $30 to $40 per month. The last two measures were formulated into law.

Education.—According to the report of 1939–40 the enrolment and teaching force of the various branches stood, respectively, as follows: elementary schools 87,960 and 2,670; high schools 22,245 and 934; University of Arizona at Tucson 2,906 and 275; State Teachers college at Tempe 1,505 and 72; State Teachers college at Flagstaff 545 and 41. In addition, there were 32 private, parochial and federal Indian schools with a total enrolment of 7,208.

Public Welfare, Charities, Correction.—In Nov. 1941 there were 38,872 persons receiving assistance from the state department of social security and welfare, with a total state expenditure for the month of $330,911. In Nov. 1940 there were 38,664 persons receiving $443,170. State appropriations for 1941 were as follows: industrial school $57,370; juvenile girl offenders $50,000; pioneer home $75,630; prison $181,540; state hospital for insane $298,675; school for deaf and blind $83,870.

Leading Agricultural Products of Arizona, 1941 and 1940

Crop	1941 (est.)	1940
Wheat, bu.	465,000	819,000
Oats, bu.	377,000	297,000
Sorghum grain, bu.	1,508,000	880,000
Corn, bu.	406,000	362,000
Cotton lint, bales	203,000	195,000
Grapefruit, boxes	3,000,000	2,050,000
Oranges, boxes	600,000	500,000
Horses, head	70,000	70,000
Cattle, head	840,000	864,000
Sheep and lambs, head	793,000	755,000



BRITISH MANIKINS modelled the latest creations of London dressmakers at Buenos Aires and other South American capitals in May 1941 in a concerted drive to capture the Latin American style trade

Communication.—The total road mileage in 1941 was 28,291; 3,453 mi. were improved and 3,644 were under the state system. Total railroad mileage, Dec. 31, 1939, was 2,234.

Banking and Finance.—National banks in 1941 had deposits of $70,202,000, loans of $34,911,000 and investments of $17,595,000. State banks had deposits of $30,451,000, loans of $11,124,000 and investments of $12,466,000.

Agriculture.—Citrus fruit, cotton, lettuce and beef cattle ordinarily comprise three-fourths of the value of farm products of Arizona.

Manufacturing.—Only 8.4% of the population were engaged in manufacturing in the state in 1941. The most important industries were food, textile, metal and lumber products.

Mineral Production.—Seven districts ordinarily contributed 99% of the output of copper for the state. The copper output for 1941 was estimated at 671,000,000 lb. The value of all mineral products for 1941 was estimated at $100,000,000. (H. A. H.)

Arkansas.

In the south-central U.S., Arkansas was the 25th state admitted to the union (1836). Its older popular name is "Bear state," the newer (by act of the legislature), "Wonder state." Area, 55,336 sq.mi.; pop. (1940) 1,949,387. The population is predominantly rural, although the 1940 census showed a slight movement to the cities, the urban population having increased from 20.6% in 1930 to 22.2% in 1940. The white population was 1,466,084; Negro, 482,578; other races, 725; foreign born, 7,692. Only 3,210 aliens registered in 1941 under the federal law. The capital is Little Rock (88,034). Other cities are Fort Smith (36,584); Hot Springs (21,370); Pine Bluff (21,290); North Little Rock (21,137); El Dorado (15,858); Texarkana (11,821).

History.—The following state officials, all Democrats, were inaugurated on Jan. 14, 1941, for a two-year term: Homer M. Ad-

kins, governor; Bob Bailey, lieutenant governor; C. G. Hall, secretary of state; Jack Holt, attorney-general; Otis Page, land commissioner; Earl Page, treasurer; J. Oscar Humphrey, auditor; J. S. Holt, associate justice of the supreme court. The outstanding act of legislation in 1941 was the refunding of the highway debt with the RFC at a lower rate of interest. To make assurance doubly sure, court proceedings and a referendum were held on the bill. Other acts of importance were: allowing cities of the first class to levy taxes to pay salaries and pensions of firemen and policemen; establishment of civil service in cities with a population of 20,000 and more; authorizing the governor to join interstate compacts for the conservation of oil and gas; forbidding political parties to name candidates except through primaries or conventions (this was a slap at the Democratic state central committee for naming a candidate for U.S. senator); exempting servants, farm labourers and others from the workmen's compensation law; reorganizing the board of trustees of the University of Arkansas and taking the governor and the secretary of the board of education off the board. According to the old plan of congressional apportionment, Arkansas would have lost one seat in the U.S. house of representatives and Michigan would have gained one. Congress, however, amended the law for "equal proportions" for representation instead of "major fractions," and Arkansas held its seven seats in 1941.

Arkansas had received, by the end of 1941, defense contracts amounting to $12,610,000, among them a munitions plant at Jacksonville and a $33,000,000 aluminum plant on Lake Catherine, near Hot Springs. A $20,000,000 power plant was contemplated, but in the meantime a tie-up with Grand river dam in Oklahoma was to supplement local power.

Education.—The enrolment in the public schools in 1941 was: grades one to eight, 398,246; grades nine to 12, 73,708, a total of 471,954; teachers numbered 13,173; expenditures were $14,023,914. At the state university in the fall semester, 1941, the enrolment was 2,443; teachers numbered 186. Enrolment in state teachers' colleges was 1,040; teachers, 82.

Public Welfare, Charities, Correction.—Appropriations for welfare in 1941 amounted to $7,000,000, plus $884,440 for administration; confederate pensions, $300,000; firemen's pensions, $300,000; teachers' retirement, $207,000; food and cotton stamps, $200,000; employment, $91,000. The penitentiary had 900 white inmates, 800 Negro (including 45 women); the state farm for women had 68. The legislature appropriated $528,800 for the penitentiary; $67,960 for the boys (white) industrial school; $50,390 for the girls' industrial school; $64,350 for the Negro boys industrial school.

Communication.—The state had 9,289.3 mi. of highways in 1941, of which 1,242.7 were concrete, 486.8 asphalt, 1,357.1 bituminous and 5,575.8 gravel. The appropriations for 1941–43 were: $19,650,000, including $3,000,000 county highway fund, $10,000,000 federal, and $6,650,000 state highway. The railway mileage was 4,538.

Banking and Finance.—State bank and trust companies numbered 167 in 1941; building and loan associations, 9. The resources of the former amounted (Sept. 24, 1941) to $121,062,240; deposits, $108,159,436. The national banks numbered 50 with $143,121,585 in assets and $128,831,694 in deposits (Dec. 31, 1940).

State revenue received in 1939–41 was $63,016,301.78. On Dec. 31, 1941 the debt was $146,850,223, a reduction of $4,611,629 from Nov. 1939.

Agriculture.—The total value of crops produced in Arkansas in 1940 was $169,000,000. The cotton crop in 1940 was valued at $69,712,000; corn, $24,884,000; rice, $6,919,000.

Table I.—*Leading Agricultural Products of Arkansas, 1940 and 1939*

Crop	1940	1939
Cotton, bales	1,540,000	1,351,209
Corn, bu.	42,903,000	33,762,323
Rice, bu.	9,741,000	2,185,242

Manufacturing.—In 1939, the industries of Arkansas turned out products valued at $160,166,984 and employed 39,438 persons to whom they paid wages of $30,787,479.

Table II.—*Principal Industries of Arkansas, 1939 and 1937*

Industry	Value of Products	
	1939	1937
Sawmills and kindred works	$35,222,273	$35,963,098
Cottonseed oil, etc.	17,340,538	14,383,526
Petroleum refining	14,327,824	21,320,560
Nonalcoholic beverages	5,632,283	878,381
Household and office furniture	5,441,196	6,627,435
Bread and bakery products	4,910,418	5,384,284
Newspaper publishing and printing	3,848,381	3,661,977

Mineral Production.—The total value of mineral production in Arkansas in 1940 was $33,705,929; in 1939 it was $28,563,693.

Table III.—*Principal Mineral Products of Arkansas, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Petroleum	$21,230,515	$16,931,240
Coal	4,480,713	4,103,020
Bauxite	2,804,144	2,293,455
Manganese	126,299	89,178
Natural gas	578,808	545,936
Natural gasoline	520,669	754,709

(D. Y. T.)

Armies of the World.

During the year 1941, 30 armies of the world engaged in warfare as World War II extended widening circles of conflict on land and sea and in the air. The preceding 16 months had seen some armies disappear following defeat in major engagements. Others were ineffective and offered no serious resistance to attack. Victorious armies continued the march of conquest and consolidated fresh gains in new territories. Large armies remained engaged in major conflicts. New armies entered the war within the closing weeks of the year.

In Russia, Germany and Finland opposed the enormous and partially tested strength of the Soviet Red army. In western Europe, North Africa, the near east, the far east and in China the armies of the dictatorships remained opposed to the forces of the democracies. In the western hemisphere, the United States, attacked by Japan, without declaration of war and in the midst of peaceful efforts, entered the war on Dec. 8, 1941. There had been widespread unprovoked attacks on U.S. outposts in the Pacific before the Japanese declaration of war. Japan also declared war against Great Britain while the British and the nations associated with them entered the war against the Japanese. In a world of conflict all armies of the world were affected in large or small degree. Each played a role, first in relation to national policy, and second, dependent upon international demands. A limited military analysis of the armies of the world without weighing these policies emphasizes principally the results of military action. For the most part, the armies examined here participated in campaigns during 1941. A brief examination is included of those armies preparing for but up to Jan. 1, 1942 not actively engaged in combat. Any contemporary analysis of the principal armies of the world is limited by the restrictions imposed by warfare censorship. All factual information is presented after careful selection from material secured from the best available sources.

Germany.—By Jan. 1, 1941 the German armies had overrun Denmark and Norway; repulsed British attempts to dislodge them; invaded and defeated Luxembourg, Holland and Belgium; outflanked the ill-famed Maginot defenses; eliminated effective British and French opposition on the continent; acquired an Italian ally; and closed 16 months of combat marked by a rising tide of nazi supremacy on modern battlefields. All German theory of the conduct of military combat has been based upon the immutable principles of war. Political circumstances, as well as the application of modern machinery, demanded changes in the modern application of this theory. The results of defeat in World War I, the restrictions of the Versailles treaty, the complete coordination of all political, social, industrial and military strength within a unified plan of grand strategy, the full exploitation of diplomatic geographical advantages, increased mobility gained by the development and application of the combustion engine, improved techniques in propaganda and the war of nerves, the relentless pursuit of perfection in details; these plus an inspired and cultivated national determination to re-establish the invincibility of German arms, combined to produce a national military machine unprecedented in power, secured by resounding success,

and prepared to extend the area of conquest during the year 1941.

Organization.—Never before in history had the principle of a "nation in arms" been so fully developed. The whole nation had been organized and blended as a unit for the sole purpose of aggressive war. The German armies were organized as a part of the large team combining all effective elements of national strength. A principal factor peculiar to the German organization was the co-ordination of high command in the realization of the single purpose: the prosecution of war. Tables I and II present a brief analysis of the national organization and the relation of the military forces to all other national efforts.

Table I

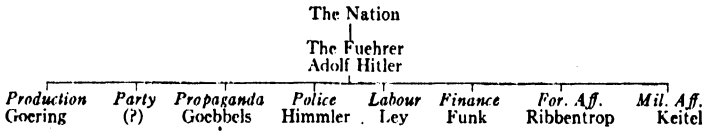
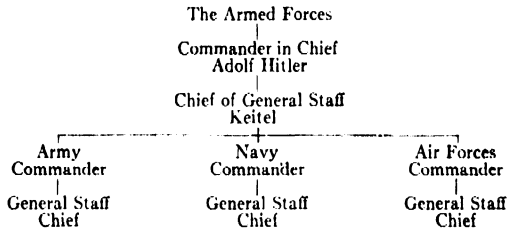


Table II



These tables illustrate the concentration of power and effort, and the simple channels of command, and suggest the relative ease with which unified control can be assured for any plan or project. No table can solve specific problems, and any solution must rest upon the co-ordination of many parts and the resolution of many intangibles. However, all planning within this channel of command appears to rest upon a single principle. That principle, in the popular language of the German press, has been stated as follows: "The right man is everywhere and always put in the right place."

The method of arriving at a solution to a specific problem appeared to be as follows: The national and international aspects of the political, economic and social elements of the problem are examined and a decision announced by the national organization outlined in Table I. This decision is presented to the chief of the general staff as a mission by the commander-in-chief of the armed forces. The chief of the general staff then translates this mission into a directive which, when approved by the commander-in-chief, is discussed at a meeting of the commanders of the three armed services, army, navy and air forces. Above all other consideration, the primary decision reached by this group is the selection of a single commander to whom full responsibility as well as all available resources are given to accomplish the particular task. This commander may be a member of any one of the three armed services. His selection is made principally dependent upon the nature of the mission to be performed and because he is considered to be the individual most likely to succeed. Once chosen, this commander becomes directly responsible to the chief of staff of the armed forces and to the commander-in-chief for the successful accomplishment of the mission. In addition, it is an established policy to grant to the commander in these cases not only the full responsibility and the available means, but also the widest exercise of initiative in carrying out his mission.

The task force system results in the organization of fighting teams composed of units from the army, the navy and the air forces. This system substitutes interdependence among the fighting branches for the independent or separate control method sought by the army, navy and air forces in other nations. By carefully determining the forces, *i.e.*, the tools, required to perform the task, this system permits close control and full co-ordination in accomplishing the particular objective. So far as Germany is concerned, and insofar as the German armies reflect the national will, this type of organization was successful during more than two years of modern warfare.

Tactics.—The outstanding military development shown by the German action in campaigns has been the successful use of armoured and air forces in close and continuous co-ordination with other ground troops. During 1941, and principally in the campaigns in the east, the German armies developed and applied tactics popularly known as the "wedge" and the "kessel." The panzer, or armoured divisions, formed the spearhead of a gigantic phalanx moving toward the opposition. Immediately in rear of the spearhead, motorized divisions are grouped and move forward at the same speed. This phalanx, or armoured wedge, sought to create openings in the enemy line. As the advance of the wedge continues, second line infantry divisions move up on the flanks increasing the width of the wedge and decreasing gaps between wedges. The strategic rate of speed of the whole force is based on the march rate of the infantry divisions. Once the shock wedges create gaps, they form the walls dividing the parts of the enemy line which have become separated. The shock wedges then swing right or left to surround the sectors which have been

Table III—*Comparative Strength of the Chief Warring Powers**

Area and Population		
	Area (sq. mi.)	Population
Allies		
United States	3,738,395	132,000,000
Great Britain (Empire)	13,539,113	504,218,200
Russia	8,819,791	192,695,710
China (Unoccupied)	4,060,992	207,000,000
Netherlands Indies	738,267	70,500,000
Total	30,896,558	1,106,413,910
Axis		
Germany (before Sept. 1939)	263,618	93,000,000
Japan (before July 1937)	260,644	97,697,555
Italy	119,800	44,557,000
Hungary	59,380	13,507,993
Finland	131,588	3,834,662
Bulgaria	42,808	6,549,664
Rumania	72,525	14,098,850
Total	950,363	273,245,724

Armies		
	Men	Divisions
Allies		
United States	1,600,000	33
Great Britain	3,000,000–3,500,000	60–70
Russia	3,000,000–5,000,000	150–250?
China	2,000,000–6,000,000	?
Netherlands Indies	100,000	?
Axis		
Germany	6,000,000–8,000,000	280–300
Japan	1,800,000	60–66
Italy	1,500,000	60
Hungary	180,000–450,000	10–20
Finland	200,000–250,000	14
Bulgaria	180,000–450,000	10–20
Rumania	800,000–1,200,000	30–35

Taken from *New York Times* of Dec. 14, 1941.

For naval forces *see* NAVIES OF THE WORLD. For aircraft combatants *see* AIR FORCES OF THE WORLD.

The United States department of commerce—census bureau—according to a *New York Times* dispatch dated Dec. 17, 1941 estimates Allied manpower between 18 and 35 years of age to be 56,643,000. The same dispatch indicates a census bureau estimate of Axis manpower in the same age group to be 28,560,000. The newspaper account indicates that these totals do not include figures for China, India and the Dutch East Indies. Including these nations the Allied total is estimated as 163,887,000.

The reported estimates appear to be based upon the following:

Allies		Axis	
United States and possessions	22,796,000	Japan	10,839,000
Russia	23,574,000	Germany	11,281,000
England (not including India)	10,273,000	Italy	6,440,000
	56,643,000		28,560,000

*Corrected for known losses up until Dec. 12, 1941.

split off from the main body of the opposition. Then the infantry divisions in rear of the cutting edge of the wedges move forward and carry out the encirclement and destruction of the enemy groups which have been separated and cut off. This encirclement and destruction represent the final play of the tactical move. This action is known as the "kessel." The word "kessel" is adapted from a hunting term applied to the practice of encircling game, driving it toward the centre, and destroying it. In the tactical sense, the rapid creation of gaps at weak points in enemy lines, the cutting off of sectors of the line between gaps, the rapid inrush of infantry troops to encircle these sectors and eventually destroy the opposition, have all become a continuous sequence of the German tactics as practiced on the modern battlefield. Throughout this type of operation the combat air forces prepare the way and then give continuous support to the ground forces. Overhead the air forces operate immediately in front of the advancing elements of the wedges and later join in the destruction of the encircled enemy forces. The outstanding characteristics of the whole tactical operation can be summarized as follows:

A. Concentration of armoured forces and motorized infantry elements in a spearhead or wedge attack.
B. Shock action to create gaps at one or more weak spots.
C. Rapid separation of the enemy line into several sectors.
D. Swift encirclement and relentless destruction of the surrounded elements.

The adoption by the German army of the task force organization, and the tactical development of the "wedge" and "kessel" type of air-ground action, do not indicate excessive rigidity in the composition of forces or in the conduct of operations. On the contrary, this type of organization and the co-ordination of all arms which it insures permit great flexibility within command channels, and introduce fluidity in tactical movement. The task force may be of any size and may include a few or several units from one or all the armed services. The close co-ordination of air and ground combat units allows maximum mobility and rapidly brings pressure against predetermined weak spots.

Other elements of interest in the composition of the German armies as indicated in reports of operations during 1941 are discussed in the following paragraphs under appropriate headings.

Combat Troops.—During 1941 two types of armoured division, the large and the small size, appeared. The main difference is noted in the tank brigade, either medium or light, which is integral with the large division while the small division has a light tank regiment.

Motorized Division.—Motorized divisions consisting of artillery on self-propelled mounts, motorized reconnaissance units, some tank units and motorized infantry, have accompanied the armoured divisions. The result is that a strong infantry-artillery team is thus made available to capitalize on the advantages gained by the air-ground support and armoured divisions.

The German armies have developed a number of anti-tank weapons which are moved on self-propelled mounts. These weapons have similar characteristics in that each is designed to deliver effective fire power from a mobile base or platform. In use these anti-tank weapons are grouped in "tank destroyer" units which appear to be loosely organized and as yet not co-ordinated in any fixed form applicable to all parts of a German field force. The development is significant since it emphasizes that experience gained in actual combat indicates a need for an organic anti-tank force. The trend of development appears to be toward masses of roving mobile guns, capable of offensive as well as defensive action, comprising mainly self-propelled armoured gun mounts, accompanied by air and ground reconnaissance units as well as some motorized infantry and pioneer services.

Miscellaneous.—Other developments in the German armies include the appearance of parachute troops in large numbers, some units equipped with camouflaged chutes; air-borne infantry in transport planes and, in some cases, in towed gliders; flame-thrower units for close-in attack of small fortifications; the substitution of the German civilian "volkswagen," or small commercial passenger automobile adapted for military use, in place of the motorcycle; amphibian tanks of medium size, 25-30 tons, transported to coastal waters on shallow-draught carriers and also capable of making river and stream crossings; the employment of dogs with ground reconnaissance and patrol units; the development of reconnaissance units consisting of light troops including cavalry, horse and mechanized cyclists, armoured and scout cars, and a co-ordinated messenger service, the wide use of inflated rubber pontoons and other boats and improvised rafts; the front line employment of pioneer units incorporated in motorized divisions and also in the reduced size panzer or armoured divisions.

In addition to these developments mention should be made of the German perfection of their methods for combat exercise training; march discipline; traffic control; supply; medical, veterinary, provost and postal services; extension of the labour battalion service; and the introduction of a semi-military corps of civilian officials performing rear area duties and releasing large numbers of military personnel for combat zone service.

Above and beyond all these particular developments, each important as an example of actual combat experience, are the improvements in air power and especially the co-ordination between air and surface (both ground and water) units and the substitution of mass air bombings for the time-honoured duel between masses of artillery guns.

Summary.—The German nation is organized for continuous and unlimited support of the single purpose: the prosecution of total warfare. The type of organization employed permits the creation of flexible task forces incorporating predetermined percentages of army, navy and air force units, trained to accomplish a specific job under the command of a single commander chosen for the particular task. Combat experience indicates that interior organization of combat units permits rapid reorganization to meet local needs with a marked tendency toward increase in air forces and panzer or armoured divisions. In all cases there has been improvement in combat air operations co-ordinated directly with ground operations, while strategic air combat continues as a separate air activity.

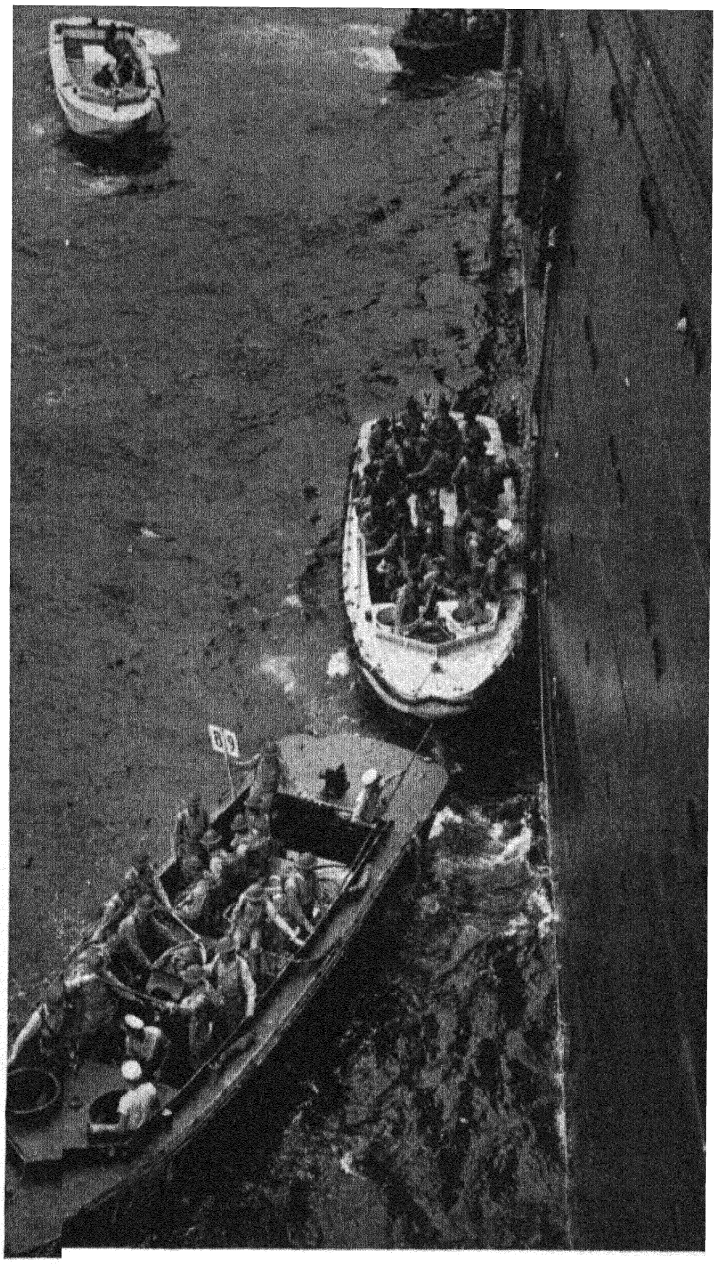
German authorities without underrating the importance of the support received from all elements of the home front, attributed the success of German armies to the following military factors:

A. The strategic and tactical employment of air power.
B. The employment of armoured forces and motorized infantry.
C. The aggressive action of ground divisions on foot accomplishing the complete elimination of effective opposition.

Great Britain.—After 16 months of warfare the British armies by Jan. 12, 1941 had been forced out of the principal areas of western Europe and had been limited to operations in Africa, the near east and the defense of the British Isles. During 1941 increasingly large forces from the British dominions and colonies joined with British forces to extend military operations in new theatres of war. These developments introduced several changes in the British types of army organization and required modification in the application of the basic British theory of combat.

While the campaigns in Greece and Crete, the operations in Libya and Egypt, and the British success against Italian armies in East Africa all varied in particulars, each contributed marked changes resulting from actual combat experience. The conduct of the several campaigns is discussed under WORLD WAR II. An examination of the British armies indicated the following basic developments.

Theory of Combat.—The general war policy of the British has been based upon defense of the outlying posts of the empire and

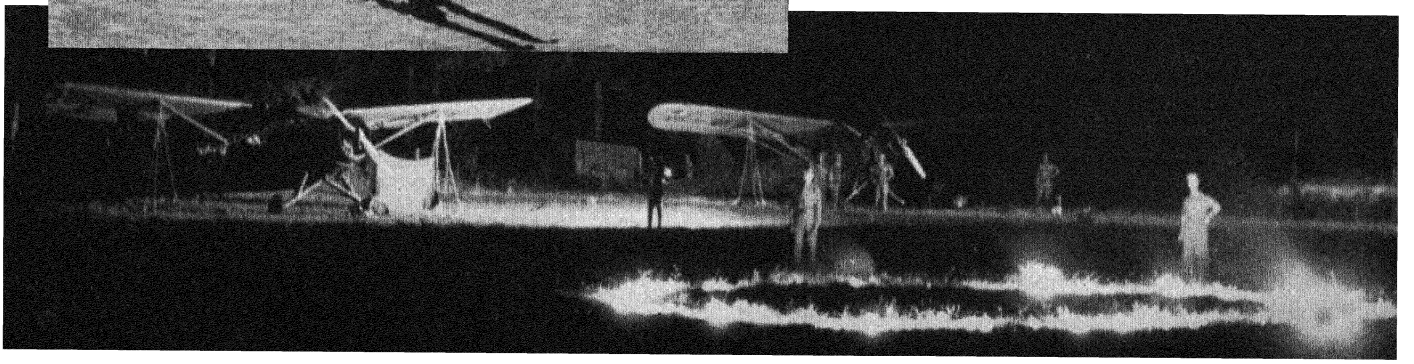


Above, left: ANTI-AIRCRAFT BATTERY in action at Lake Charles, La., during war games of the 3rd U.S. army in Aug. 1941

Above, right: U.S. MARINES rehearsed in landing boats in 1941 alongside the ex-liner "Manhattan," converted into a troop transport ship

Left: THE TRAINING OF U.S. TROOPS for ski-patrol duty began at Mt. Rainier, Wash., during the winter of 1940–41

Below: CIRCLE OF FIRE lighted by U.S. troops as a night target for messages dropped from a friendly observation plane, during the army's large-scale war games in Louisiana in Sept. 1941



the defense of the British home front. This theory has not changed in its basic concept, but the development of methods to accomplish these objectives, and the application of these methods, resulted in changes in army organization and battlefield tactics. While beyond the home front limited campaigns have been conducted, at home the theory of defense still applies with greater emphasis on air and anti-air activities defensively, plus development of offensive air power, coupled with widespread civilian defense and industrial mobilization.

The results of these activities have been seen in the creation of a large armed force in England. The first step in this development was a careful selection of men for service with the army, the navy and the air forces. This selection process permitted the assignment of men especially qualified for each branch, and also permitted the adoption of a school system wherein men were trained for specific duties. In conjunction with this selection system, the British started large-scale training programs to develop apprentices in all war industries, and adopted a civilian draft law which permitted the assignment of all able-bodied men and women to civilian tasks according to ability. Within the British Isles the whole population was included in plans for home defense. Civilian air-raid warning service was established. Air-raid precaution programs engaged millions of civilians as wardens, firemen, medical attendants and in associated tasks. In the military services the development of radio and other means for detection of enemy aircraft, the improvement in anti-aircraft defenses, and the great increase in air defense over the islands as well as air offensives against the invasion coast and against military objectives in Germany, all marked the changes in defense of the British home front. The national productive capacity was organized to meet the requirements of the war effort. Meanwhile, defense plans had to provide protection for vital water and land communications. The whole character of British defense methods had been changed to meet the continued air attacks and the ever-present threat of invasion. Considerable success had been made in the development and in the actual operations of all these methods of defense. Particular success had been accomplished in air tactics, anti-aircraft defenses and the civilian air-raid warning and precautions agencies.

In both cases the British theory, while modified by developments in 1941, still necessarily rests heavily upon the use of naval power and still employs naval strength to establish confining blockades, to maintain communications between combat zones and the home front, and to insure the uninterrupted flow of supplies for war purposes. Any discussion of the British armies must include reference to this initial reliance upon sea power, the rapid development of air power both defensively and offensively, and the demands for interior reorganization of units resulting from actual combat experience.

Some of the other developments within the British armies included: increases in mobile artillery operating with ground infantry; creation of mobile anti-tank defense units; gradual growth of tactical air combat co-ordination with ground forces; application of battlefield mobility particularly in open desert warfare; improvement in battlefield communications. Weaknesses noted included shortages in modern tanks, anti-tank weapons and mobile anti-tank weapon carriers; failure to secure flexibility in organization of armoured forces permitting large-scale operations for sustained periods; inadequacy of motor maintenance and supply systems; shortage in combat aviation for co-ordinated use with ground forces.

Summary.—At the close of 1941, British armies were denied a foothold on the western European peninsula. Brilliant success had marked the stubborn advance of independent forces in East Africa, and periodic but erratic success had been accomplished in open mechanized ground and air combat in northern Africa. On the whole, British forces were employed in long-range defensive warfare with occasional aggressive actions resulting in limited gains except in East Africa where decisive results were achieved. A gradual scheme of reorganization was noted, more pronounced in the campaigns in North Africa than in other theatres. All land action appeared to be greatly influenced by naval action and strategic air combat as well as more extensive employment of armoured and mechanized ground forces. Morale appeared to be superior on all fronts. The British armies appeared to be slowly approaching the strength required to launch sustained attacks seeking a decisive victory.

Engaged with enemies in Europe employing land-based armies relatively independent of sea-borne supply and communications, and forced to employ her navies for both Atlantic blockade and convoy duty as well as open warfare in the Pacific, Great Britain continued to rely on naval strength and air power to establish an eventual superiority permitting her reorganized and re-equipped land armies opportunities for decisive operations.

Italy.—Italian armies continued to play a minor role in the operations of axis forces during 1941. The Italian theory of combat has always included the creation of a strong defensive base within Europe, permitting the initiation of limited offensives supported by naval action and strong combat air action. The first 16 months of combat proved that the Italian theory could not be supported in practice. Severe defeats were inflicted by the Greeks in western Greece and in Albania. Initial success in Libya had been seriously threatened by the rapid sweep of British forces to the west. In East Africa, victories over poorly equipped native forces were subject to strong British offensives. All Italian action during 1941, on a scale large enough to allow analysis of strategic and tactical importance, was confined to northern and eastern Africa. Italian operations in the Greek and Russian theatres appeared to be minor, and existed apparently despite Italian inactivities.

East Africa.—In this theatre Italian armies, estimated at about 110,000–200,000, were engaged at widely separated points by independent British forces during 1941. Shortages in basic supplies of food, fuel and ammunition; limited capacities for motor maintenance; the loss of supply routes due to inferior naval and air power; and the guerrilla warfare employed by native troops, all contributed to Italian defeats. Italian organization includes modern armoured forces as well as motorized divisions and especially emphasizes the characteristics of units trained and equipped for mountain operations and desert warfare. It is unlikely that the full strength of the Italian forces was ever employed in East Africa since the lack of basic supplies and the continued inferiority in the air and naval strength precluded the initiation of long-range offensive action. The armies appeared to split up into independent forces, each adopting local defense tactics and all employing to the fullest extreme the advantages of the difficult terrain. Defense tactics indicated excellent organization of the limited field artillery forces and stubborn local defenses within the limitations of available equipment.

Summary.—The Italian armies were engaged in numerous campaigns in Greece, Albania, North Africa, East Africa and the Ukraine during this period. No major offensive produced decisive results. Defensive actions in East Africa were stubbornly fought and indicated improvement in Italian artillery organization despite the loss of the defended areas. The Albanian offensive was a failure. Minor offensives were launched in Africa on limited objectives by Italian mechanized and motorized forces. Joint Italian and German forces launched larger offensives in northern Africa, and Italian ground and air forces operated in Greece and in the Russian theatre with German columns. Shortages in modern mechanized equipment, limitations on air action, probably due to inadequate pilot and ground organizations, and the ever-present restrictions on land operations in Africa where supply lines by sea were subject to British naval and air attack, all contributed to reducing Italian operations to minor importance. In addition it became apparent that the Italian civilian support was not wholehearted and many were not in favour of Italian participation in the war. All Italian army activities were seriously affected by geographical distributions within the continent and overseas in Africa, by the primary importance of naval and air action in the Mediterranean sea, and basic limitations on modern supplies made available from an apparently reduced and disorganized industrial capacity.

Russia.—The Russian armies were engaged in major offensive action with the German armies during the period June to Dec. 1941. The Russian theory of combat has been based upon a strong defense of the land frontiers of the far-flung soviet union with emphasis upon air and ground action and with naval strength considered a secondary part of the national defense. Early indications of Russian army organization, noted during the Finnish campaigns and during the westward expansion of the Russian state during 1939 and prior to the German attacks in 1941, suggested that numerically Russia was strong in manpower and in machines. However, the conduct of operations in those periods indicated many faults in the leadership and organization of this strength for use in battle. The first six months of warfare against Germany showed a change in Russian strength and in the conduct of operations. Without launching a large co-ordinated land and air attack, Russian armies fought brilliant delaying actions and adopted dagger-thrust attacks of limited extent in ground distance, but of serious counter-effect against German columns until the start of full-scale offensives in mid-December. Siege operations at Leningrad and Odessa and later at Moscow indicate a complete organization of both armed services and civilian

population for land defense. Russian tactical doctrine appears to include strong resistance in depth coupled with stubborn delaying action in all cases, frequently including adoption of minor siege operations where large forces were surrounded by the opposition. In equipment the Russian armies appear to have considerable numbers of all classes of vehicles and weapons. Some doubt appears to exist as to the efficiency of this equipment as much of it seems to be below the standard of modern design. Maintenance of mechanized equipment appears adequate wherever relatively stable conditions of warfare permit. In the air, Russian operations have given indications of larger air forces than expected. The campaign has produced no unusual characteristics of Russian organization or doctrine except the success achieved in delaying actions and the extent of losses inflicted on German air and ground forces. The operations in the closing weeks of 1941 indicate an adherence by the Russians to their old tactical conception of weakening an enemy through attrition, weather and length of supply lines, when counteroffensives for decisive results are undertaken. The offensive was undertaken in the southern area near Rostov and the Moscow front at the close of the year.

Summary.—The Russian armies, engaged in full-scale operations along an extensive land front, fought brilliant defensive actions both in the air and on the ground. After the initial onrush of the Germans, they seemed to regain cohesion and adopt co-ordinated offensive action. Local defense actions, principally the defense of cities, indicated a high degree of perfection in artillery and infantry organizations. Except for the offensive action undertaken in the southern and Moscow theatres late in December little opportunity was afforded observers to examine Russian tactical doctrine. Equipment at the beginning of the war appeared satisfactory. Large demands were made on American industry to meet Russian calls for assistance in securing replacements of all classes. All Russian army activities were affected by the successful extension of industrial capacity from western areas to the Ural mountain districts; the increase in British and United States assistance; the continuation of German attacks despite heavy losses; and the developments in the far east. Only limited observations were available by report due to the small number of foreign observers given access to records, the extent of the area involved and the necessary limitations imposed by censorship.

Japan.—The Japanese armies extended the area of operations during 1941 by moving to the south into Indo-China, and by the joint army and navy operations undertaken in December against the United States and Great Britain in the far east and the Pacific. The Japanese theory of combat has been offensive, dependent upon the home islands as a base of operations supporting joint naval and land action in Asia. In practice the Japanese armies have been engaged principally on the continent against large but relatively unorganized and poorly equipped Chinese forces. Japanese organization parallels the modern army types, modified to suit the requirements of terrain and opposition encountered in China, and the limited Japanese raw materials. Some success has been accomplished against organized Chinese forces and fortified Chinese positions. At all times Japanese forces appeared less effective against unorganized Chinese guerrilla attacks. Japanese operations in the air appear to be extensive against weak opposition from enemy air and ground defenses. All Japanese army operations were mainly dependent upon the maintenance of sea-borne supplies and the continued increase of national industrial capacity. The naval fleet and air operations, particularly in the closing weeks of 1941 which marked the opening of major warfare against the United States and Great Britain, overshadowed the army operations. However, extensive army attacks were developing against the Philippine Islands, Singapore and Hongkong, which fell on Dec. 25.

Summary.—It appears that the Japanese armies are fairly well equipped with modern machinery and capable of maintaining more than 2,000,000 experienced soldiers in the field. During the prolongation of the combat operations in China, large numbers of Japanese units have received actual battlefield experience. All army operations have been characterized by the type of Chinese resistance which appears to have been for the most part unorganized and of the guerrilla rather than modern field army form. No decisive land actions have resulted from Japanese army operations. Considerable co-ordination has resulted from joint naval and army actions, and extensive experience has been gained from air activities against weak resistance. The limited period of Japanese operations during the closing weeks of 1941 indicated more naval and air activity than army activity, although landings were made against Hongkong and in the Philippines and on the Malayan peninsula by ground forces. Limitations of censorship and the brief period covered by these operations preclude extensive analysis of Japanese army characteristics.

China.—The Chinese forces were engaged in major warfare with Japanese armies throughout 1941. Chinese armed forces were estimated at about 5,000,000 including unorganized but effective guerrilla groups. Wherever stable, organized units existed, the Chinese army resembled the modern field armies, but were short of modern equipment. In all cases, the glaring shortages of modern equipment rendered ineffective any large-scale attempts to engage in full-size tactical operations. Limited offensives were undertaken with frequent spectacular success wherever equipment and training permitted. For the most part, air operations were unco-ordinated with ground operations and were limited to harassing bombing activities. The Chinese theory of combat is entirely defensive in character. The initiation of offensive tactics in all cases depended upon supplies of all classes, the training of guerrilla groups for joint action within larger organized field forces, and the gradual extension of a national understanding of the need for and support of a major co-ordinated effort against the invader.

Summary.—Limited offensive actions were undertaken by relatively small but determined forces. Industrial capacity was low and imports limited to supplies received over the Burma road. All army operations were affected by the extent of the area involved, the delay in creating a national effort, and the extension of the war outside the Chinese mainland. Japan was unable to secure decisive results against Chinese forces.

United States.—During 1941 the United States continued large-scale manoeuvre training programs within continental limits, increased the strength and defenses of newly acquired bases and existing overseas garrisons, and approached the close of the year with a greatly improved and considerably larger army than the nation had ever known in times of peace. On Dec. 7, 1941, Japan launched surprise attacks on Pacific garrisons and declared war on the United States. On Dec. 11, 1941, Germany and Italy declared war on the United States. These events, followed by prompt U.S. declarations and the extension of military service to the close of hostilities, emphasized not only the results attained to date but the serious duties facing the army in the future. The theory of combat of the United States army has always been offensive. Foreign wars have always been fought by joint naval and land operations based upon a strong home front furnishing required replacements of men and supplies. Overseas garrisons have always been reduced to a minimum strength frequently considered far below potential needs. During times of peace, and particularly following World War I, the natural desire of a civilized state to abjure war and refrain from hostilities resulted in a drastic reduction in numbers and severe limitations on training and adequate procurement of modern supplies for even a small force.

The rise of dictatorships and the spread of World War II resulted in an increase in strength, principally by means of a draft. As the tempo of war increased, the United States turned to the production of war supplies for the armies opposed to Germany, Italy and Japan, and in turn to meet the expanding needs of its own army. The year 1941 was marked particularly by the organization and transportation of modern units to defend outlying bases and possessions, by the completion of large-scale field army manoeuvres, by advancing the organization of large army units, and by the organization of a vast production plant. (*See* also DEFENSE, NATIONAL [U.S.]: *Armed Forces.*)

Organization.—The United States armies are organized as field forces for administration and training within the continental limits, and as task force garrisons within outlying bases and possessions. The air forces remain as parts of both the army and the navy and do not constitute an independent army, but within the army have virtually an independent status.

In 1941 the creation of higher staffs and the organization of field army and army corps troops and higher air force echelons developed concurrently with the expansion in numbers of ground divisions, air and other units. The outstanding development in these respects was the separation of tactical field forces under a general headquarters (GHQ) from the territorial administration and supply activities within nine geographical areas. At the close of the year, these changes had proved to be desirable and rapid advances had been made in the conduct of training and the gradual creation of large-sized field army fighting teams. All developments within these armies were subject to the gradual acquisition of adequate modern equipment. In general, the training program progressed at a rate permitting all ranks to be prepared to use the new equipment as rapidly as it was received. Some shortages existed at the close of the year and some elements of training, notably combat firing, had been delayed due to these shortages. At the close of 1941, faced with war against three nations in Europe and the far east, the United States army was far better prepared for action than it had been when it entered World War I in April 1917.

Tactical Doctrine.—The experience gained in World War I plus development and utilization of modern armament had created within the field army command the basic elements of modern battlefield tactics demonstrated by nazi forces since Sept. 1939, but formulated to suit American characteristics. This doctrine included the close co-ordination of combat aviation with ground forces; the maximum development of battlefield mobility as well as strategic mobility; the rapid advance of striking forces to create gaps at weak spots; followed by the eventual encirclement and destruction of the opposition. While the forces comprised infantry and cavalry divisions, armoured divisions and air forces, the doctrine contemplated a close integration of all these branches; at the same time making the air forces available for independent action.

Factors beyond military control resulted in postponement of such organization or training until 1941. During this year, the gradual increase in manpower and the increasing supplies of modern machinery permitted the resumption of original plans for reorganization and large-scale training programs. Armoured divisions were organized and some motorized divisions were created. Ground infantry divisions were reduced in size (triangular) within the regular army, and a start was made in similar reorganization with national guard (square) divisions. The air forces were grouped into higher commands, each comprising a bombing command, interceptor command and an air ground support command.

An outstanding development, resulting from the final army manoeuvres completed in November, was the success achieved in the use of small, highly mobile "tank attacker" units in offensives against armoured and mechanized attacks. These units, improvised for the particular manoeuvres, consisted of 50 calibre, 37-mm. and 75-mm. weapons mounted for direct fire from protected self-propelled mounts, motorized infantry, combat engineers, light reconnaissance elements and small, included, combat and observation aviation. This introduction of "tank attacker" units; the development of accompanying air support units; the extension of mobile reconnaissance agencies; the organization of ground and air warning units; and the perfection of supply services, all under a single commander, were marked improvements in tactical development within a field army.

Summary.—The United States army numbered approximately 1,800,000 at the close of 1941. Extensive problems remained unsolved in the procurement of officer personnel; the rapid reorganization of required tactical field forces; the acquisition of adequate modern equipment; the continued expansion of enlisted replacements; the perfection of air-ground co-ordination; the organization of armoured forces and expansion of anti-tank and anti-mechanized units; and the acceptance of a system of unified command for combat forces including all elements of the armoured services and designed to accomplish specific combat missions. The national support necessary to meet all these requirements was crystallized and guaranteed by the declarations of war made by Germany, Italy and Japan in Dec. 1941. The broad outlines of the combat phase ahead indicated extensive joint naval and land operations with increased importance for all strategic and tactical air operations.

The year 1941 closed with an aroused and powerful nation rapidly preparing to organize, equip, train and lead in combat the most powerful armed force the world has ever known. The actual operations during the last weeks of the year were limited in scope and the details shrouded in

the necessary safeguards of wartime censorship.

Other Armies of the World.—After 28 months of warfare, the armies of the following countries disappeared as organized independent forces, either as a result of defeat in battle or due to change in national political association with axis powers: Albania, Belgium, Bulgaria, Czechoslovakia, Estonia, Latvia, Lithuania, France, Holland, Denmark, Norway, Hungary, Rumania, Greece, Poland, Yugoslavia. No information had become available of the size and composition of armies absorbed within the German system. Finland was considered allied to Germany.

Whenever small forces escaped to join governments in exile the nucleus of a new army had been formed and joined the Allies. Nations so represented included: Holland in the Dutch East Indies, Free France in Africa, Poland, Norway, Belgium, Czechoslovakia and Greece. These forces varied from a few patriots to forces small in size but well organized and partly equipped.

For a complete list of the nations allied against Germany and of those allied with Germany, see table on page 731, in WORLD WAR II.

Neutral states as of Jan. 1, 1942, included the following: Argentina, Brazil, Chile, Ecuador, Mexico, Paraguay, Peru, Portugal, Spain, Sweden, Switzerland, Turkey and Venezuela.

Conclusion.—The spread of World War II brought nearly all of the organized armies of the world into conflict at the close of 1941. Table III on page 71 indicates the nations engaged and the size of armies participating in warfare. (*See* also AIR FORCES OF THE WORLD; CHEMICAL WARFARE; MARINE CORPS; MUNITIONS OF WAR; NATIONAL GUARD; NAVIES OF THE WORLD; WORLD WAR II.) (H. A. DR.)

Armour, Allison Vincent (1863–1941), U.S. yachtsman and specialist in plant and archaeological research, was born March 18 in Chicago. Sponsored by the department of agriculture, he made eight voyages aboard his yacht to remote regions for plant and biological research. In 1932, on a trip to the West Indies, he collected rare plants and vegetables which might be introduced into southeastern U.S., and he also made important archaeological discoveries on the islands. In 1931 Armour received the Frank M. Meyer medal, awarded by the American Genetic association for plant exploration. He was an honorary fellow of the New York Academy of Sciences. Armour died in New York city, March 6.

Arnauld De La Periere, Lothar Von (1886–1941), German vice-admiral, was born March 18 in Posen, Germany. The son of a former government official in Potsdam, and a descendant of a French immigrant who became a major general in the army of Frederick the Great, the young Arnauld de la Periere received his early training in cadet schools and at the age of 17 entered the imperial navy. In 1906 he became an officer and from 1913 to 1915 he was adjutant to the chief of staff. From 1915 to 1918 he was commander of two U-boats in the Mediterranean. Germany claimed that he was responsible for the sinking of 200 Allied ships totalling more than 500,000 tons during World War I. Named commander of the German naval forces in occupied France in 1940, he was killed Feb. 24 in an accident, the details of which were not divulged by German authorities.

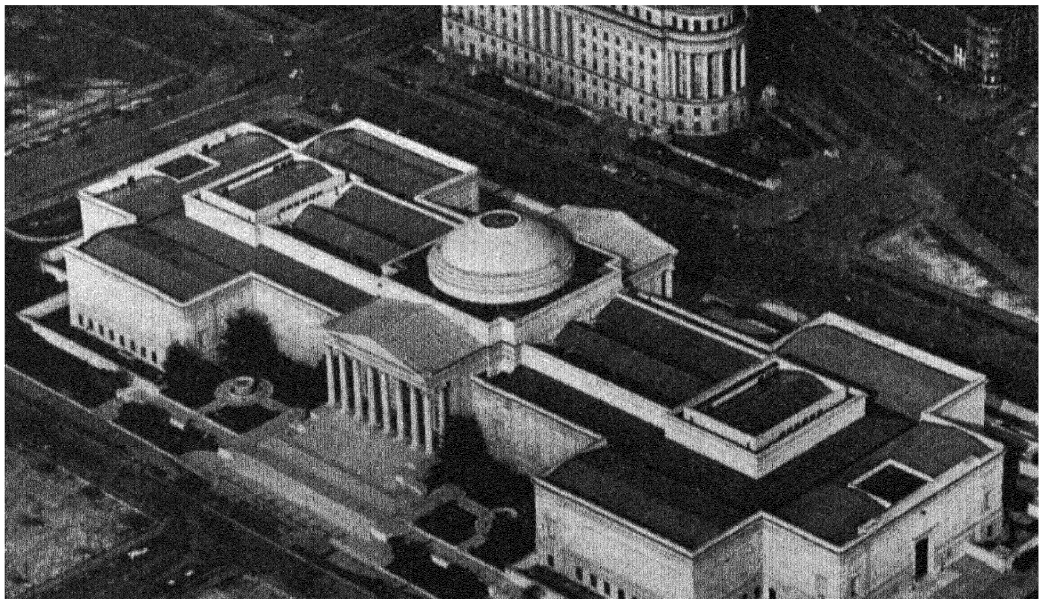
Arnold, Henry H. (1886–), U.S. army officer, was born June 25 in Gladwyn, Pa. He was graduated from West Point in 1907 and served in the Philippines until 1909. He set an altitude record in 1912, was awarded the Mackay trophy for a reconnaissance flight in the same year and was the first aviator to use radio in reporting artillery fire observed from a plane. During World War I, he headed the information service of the signal corps's aviation division and later became assistant director of military aeronautics. Gen. Arnold led a round-trip flight of army bombers to Alaska in 1934 and was awarded the distinguished flying cross in the same year. He was named assistant chief of the air corps, 1935, and major general, chief of the air corps, 1938. In Oct. 1940, he became the nation's first acting deputy chief of staff in charge of co-ordinating all matters pertaining to the air corps. In May 1941 Pres. Roosevelt made him a full-fledged deputy chief of staff. He went to England in the spring of 1941 to exchange technical ideas with British air experts and on Dec. 15, 1941, Pres. Roosevelt named Arnold for temporary promotion to the rank of lieutenant general.

Arsenic. World consumption of commercial arsenic—that is, the white oxide, and not the metal itself—is of the order of 60,000 metric tons annually, about one-third of which is produced in the United States; other producers of importance are Sweden, Mexico, Australia, Belgium, Germany and Japan. The United States is the largest consumer, taking about half of the total. The 1940 output increased to 24,983 short tons, and sales to 23,339 tons, which was supplemented by 9,929 tons of imports, less 1,600 tons exported, leaving a total supply of 31,700 tons. Both exports and imports decreased about half. Sweden alone recovers enough crude arsenic to supply the entire world demand, but only a small fraction of it is refined and used, the surplus being held in storage, this having been found to be the cheapest way to dispose of the heavy arsenic content of the Boliden gold ores, even though transportation charges and cheap supplies in other countries prevent its shipment and use.

(G. A. Ro.)

Art: *see* AMERICAN LITERATURE; ARCHITECTURE; PAINTING; SCULPTURE; etc.

Art Exhibitions. The war necessarily confined most exhibitions to the western hemisphere, where surveys of the art of a people or period proved popular. Spanish Painting was shown at the Toledo Museum of Art and Paganism and Christianity in Egypt at the Brooklyn museum. Baroque Italian Painting was reviewed at San Francisco's California Palace of the Legion of Honor and Indian Art of the United States was featured at New York's Museum of Modern Art. Australian Art began a tour of the United States with a first showing at the National gallery, Washington, D.C. The Metropolitan Museum of Art and the Art Institute of Chicago exhibited French paintings and drawings lent by the museums and collectors of France. The influence of world affairs was



THE NATIONAL GALLERY OF ART at Washington, D.C., gift of Andrew Mellon, was dedicated March 17, 1941 by President Roosevelt

evident not only in the prominence given Australian art but also in the display of Modern Mexican Painters at the Boston Institute of Modern Art and in the special section devoted to Mexico and Latin America in the Art Institute of Chicago's Twentieth International Exhibition of Water Colors. A national tour of Latin-American prints was sponsored by the International Business Machines corporation, which also backed the collection of contemporary art of the western hemisphere seen throughout North America. Three exhibitions of North American art circulated in Latin America as a result of the co-operation of the official Pan-American cultural relations committee and a group of American museums. America and Americans came to the fore in such exhibits as the new Santa Barbara museum's Painting Today and Yesterday in the United States, the Whitney museum's This Is Our City, the Baltimore Museum of Art's A Century of Baltimore Collecting. Fifty Oncoming Americans were on view at the Springfield Museum of Fine Arts and at the Boston Institute of Modern Art. Outstanding among the annuals and biennials were the Art Institute of Chicago's Fifty-second Annual Exhibition of American Paintings and Sculpture, for the first time chosen entirely by the museum, the Carnegie Institute of Pittsburgh's Directions in American Painting, which gave a chance to those Americans who had never shown in its International, and the Syracuse Museum of Fine Arts' tenth exhibition of ceramics, which for the first time included work from all the Americas.

The most noteworthy exhibitions in 1941 devoted to the art of one man were the Art Institute of Chicago's superb Art of Goya —Paintings, Drawings, and Prints; and Duveen's review of Renoir. Other interesting one-man shows, featuring the work of 19th or 20th century artists, included Faggi at the Albright Art gallery in Buffalo, Max Weber at the Associated American Artists, Iver Rose and Louis Bosa at the Schneider-Gabriel galleries, Nordfeldt at Lilienfeld's, Esther Williams at Kraushaar's, Robert Gwathmey at the A.C.A. gallery, Speicher at the Rehn galleries. Mary Cassatt was shown at the Baltimore Museum of Art, Mangravite at the Art Institute of Chicago, Jerome Myers at the Whitney, Joan Miró and Salvador Dali at the Museum of Modern Art. The late Emil Ganso was on view at the Whitney, at the Philadelphia Art Alliance and at Weyhe's. Sepeshy was seen at the Midtown, Souto at Knoedler's, Mario Carreño at the Perls gallery, and George Grosz both at the Walker galleries and the Museum of Modern Art. Old masters featured included El Greco at Knoedler's and Joos De Momper at Mortimer Brandt's.

Among the most unusual exhibitions of the year were the following: the Metropolitan's China Trade and Its Influences; Knoedler's show in honour of Cortissoz's 50th year as an art critic; Italian Drawings, 1330–1780, at the Smith College Museum of Art; prints and books published by Vollard at the Brooklyn museum; the First Century of Printmaking at the Art Institute of Chicago. • (D. O.)

Art Galleries and Art Museums.

The year 1941 began a critical decade in art galleries and museums. In England 1941 opened with some of the heaviest bombings of London in which priceless monuments and churches were destroyed by the enemy, including the famous auction rooms of Christie's. On March 17 the United States sounded a note of hope and gave refuge to unique works of European art with the opening of the National gallery in Washington. On Dec. 7 with Japan's attack on the United States, decades of progressive art collecting changed direction, and curators' plans were revised overnight from that of solely acquiring works of art to protecting them also from bombs. Following the example of England, museum directors emphasized the importance of art in wartime, as air raids of the kind that would be attempted in the United States would be directed not so much at killing people or destroying military objectives as at crushing morale. In England more books were printed than ever before, and art magazines came out regularly even when bombed out of their offices.

Certainly the most important event of 1941 was the opening of the National Gallery of Art in Washington, D.C., on March 17, when President Roosevelt accepted the gifts of the late Andrew J. Mellon and Samuel H. Kress and others for the nation. The late Andrew J. Mellon gave the building with an endowment and bequeathed 122 outstanding European paintings and 23 pieces of sculpture of the finest European schools. Samuel H. Kress donated 375 paintings and 18 pieces of sculpture of notable quality. By July 27, four months after the opening, the millionth visitor had entered the museum.

The summation of losses from enemy bombs to museums and contents in Europe during 1941 served two purposes: first, to make all realize the extent to which axis dictators will go in destroying civilian property which has no military value whatever; and secondly, to demonstrate the disadvantages of antiquated museum architecture in coping with the problems of life today. The extent of the damage to the superb early Greek objects in the museum at Candia, Crete, had not been published up to Jan. 1, 1942. Irreparable injury was caused in London when (on the night of Dec. 19, 1940) the enemy dropped 10,000 incendiary bombs on the city, destroying nine churches, among them Wren's St. Lawrence Jewry, St. Vedast and St. Bride's. The Guildhall, built in 1411–35, was burned down to the walls. Stationer's hall (built 1670) was devastated with a loss of 5,000,000 books. Grave damage was done to Trinity house and to Dr. Johnson's house in Gough street. The Inns of Court were in ruins.

Similar damage was done in Liverpool, where the City museum was destroyed by fire while the Walker gallery had a narrow escape. In May the Portsmouth City museum was demolished. The Bristol museum had already met a like fate. The Southampton Art gallery was badly damaged when a bomb crashed into a shelter full of children. The Bootle Museum and Art gallery, the Sunderland Public Museum and Art gallery, the Williamson Art Gallery and Museum in Birkenhead, the Birmingham City Museum and Art gallery, and the Coventry museum all suffered severe damage. In Hull, Old Time street with its series of original store fronts was completely demolished. The Museums and War Damage act was set up to insure museums against losses.

Reports from France stated that the Louvre, the Trocadero and the Luxembourg museum had not been stripped by the nazis but were left partially open to the public for their value as important tourist attractions after the war. However, important Jewish collections were confiscated and many of them were on view in the Jeu de Paume museum, where they were being sold for relief funds, for example the 17th and 19th century art and the 18th century paintings, and the silver collection of Maurice de Rothschild. Everywhere pictures were in great demand for investment purposes, as they were easy to transport and their value remained constant. The Jewish-owned galleries were open and doing a good business (under the direction of the enemy).

In the United States the public enjoyed displays of refugee art from Europe: the masterpieces of French art from David to Picasso, lent by the Louvre and museums of France, were shown exactly as they left France (before the war) only at the Art Institute of Chicago. Several prominent refugee artists came to the United States and enriched its culture: Leger, Kisling, Ozenfant, Berman, Mondrian, Masson and Chagall, and the sculptors Zadkine and Lipschitz. Exhibitions of paintings and of books were sent on tour to the Central and South American republics in an effort to promote better inter-American relations. Several mu-

seums abolished pay days: the Metropolitan museum in New York and the Cleveland museum. The following were among the important gifts of the year to museums: Mrs. James Ward Thorne of Chicago presented 97 of her architectural models in miniature to the Art Institute of Chicago to be used for educational purposes. The Boston Museum of Fine Arts received the significant Karolik gift of furniture and arts and crafts of the 18th century in the colonies and original states. Yale university acquired an unusual bequest of 450 works of modern art from Katherine S. Dreier. In March, Robert Moses, the New York commissioner of parks, issued a detailed statement stressing what was wrong with New York museums and how they were not relating themselves to the public. In July, William Church Osborn was chosen president of the Metropolitan Museum of Art to succeed the late George Blumenthal, who made significant gifts to the museum in his will. The Metropolitan added a junior museum consisting of a restaurant, workrooms and galleries for children. New York department stores sold works of art from the Hearst, the Clarence Mackay and the W. S. McCall collections. Various exhibits demonstrated the national importance of the art of the American Negro. The new Santa Barbara museum opened in California. (L. B. Br.)

Arthritis. Approximately one-fourth of all patients with chronic arthritis fail to become re-employable due solely to the severity of their disease. The permanent invalidity, however, is a subject which deserves further study. Judging from a review of the effect of the bombing of London on patients with "rheumatism," the added exposure and shock seems to have resulted in some increase in the amount of the disease; individual patients, however, have adjusted themselves well as a rule.

Several studies on the blood chemistry of patients with rheumatoid arthritis failed to demonstrate any significant differences from normal, except in the case of the so-called formol-gel reaction in the blood plasma, which has been found reasonably suitable as an index of the extent of systemic activity of the disease process. In this respect, it is similar to the blood sedimentation reaction. Ordinarily, chronic infectious or rheumatoid arthritis has not been considered as a disease which affects the heart. However, heart lesions have been demonstrated at necropsy in four-fifths of a small group of patients with rheumatoid arthritis.

Further studies of the spontaneous polyarthritis of rats, discovered some years before as having a marked similarity to human arthritis, resulted in one report, implying that two strains of the pleuropneumonia group, one obtained from rats and the other from a patient with acute rheumatic fever, were identical. In connection with the effect of jaundice on arthritis, Snow and Hines found that ligation of the common bile duct of rats prior to or shortly after injection of a culture of a pleuropneumonia-like organism would delay the onset of arthritis and the subsequent degree of joint involvement was diminished. This is an additional element of similarity to the human disease. Using an entirely different type of organism—the haemolytic streptococcus—Rothbard produced an acute multiple arthritis in 45 out of 51 albino rats by the intravenous injection of a strain of this organism.

Numerous additional studies on the role of gold salts in the treatment of arthritis appeared; one of them was reported as an effective chemotherapeutic agent for a variety of haemolytic streptococcus arthritis in rats. Certain gold compounds also were found to exert a curative effect on experimental arthritis produced in mice by a filtrable micro-organism of the pleuropneumonia group. Several groups of investigators, especially in the United States and Great Britain, reported favourable results with certain gold salts in the treatment of rheumatoid arthritis. All however stressed the toxic effects and cautioned against the dangers. The council on pharmacy and chemistry of the American Medical association took a conservative attitude toward the use of gold salts for this purpose. Considerable work was done on the prevention of deformities in arthritis and on reconstructive surgery of joints which had been already badly damaged. The results of repair in some cases were little short of phenomenal.

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Artillery: *see* Armies of the World; Munitions of War; World War II.

Art Sales. The war in 1941 stimulated rather than depressed the auction market. In New York, Parke-Bernet's gross sales were $3,606,381, an increase of 54% over the previous year and the biggest total since 1929. The sale of the Mrs. Henry Walters collection was the high spot of the season, bringing a total of $646,684. Important prices realized were $12,500 for Clodion's "Nymph and Satyr" and $16,500 for Boucher's "Le Moulin" and "Le Cours d'Eau." Although the Walters collection was famous for its 18th century French art, the sale's sensation occurred when a Persian silver-woven silk rug was started at $1,000 and climbed steadily to $16,000, the price paid by Miss Berenice C. Ballard of St. Louis. Nearly $500,000 in two days is the record of the sale of the Mrs. B. F. Jones, Jr., collection. Romney's "Captain William Kirkpatrick" went for $31,000 and Romney's "Miss Frances Berresford" for $39,000. A Hobbema landscape brought $30,000, a Nattier $19,500, a Gainsborough rustic scene $16,000, and Turner's "Fish Market on the Sands" was secured by Billy Rose for $15,500. Art property from the estate of the late J. Horace Harding aggregated $183,152. At this sale the record price of the year was reached by Goya's "Victor Guye," for which an anonymous collector paid $34,000. The Plaza Art galleries announced a total of $1,178,789, the result of 61 sales, in the 1940–41 season.

In England the normal activities of the great salesrooms of Sotheby's and Christie's continued and even took on new interest and importance. On April 17 the famous Great Rooms of Christie's were bombed and destroyed, but by May the firm was installed in temporary quarters in Derby house, Stratford place. The jewels which had awaited sale in a safe survived the ordeal of fire and produced a total of £17,700 when sold at Derby house. One of the most successful silver sales was that of the late Sir Lionel Faudel-Phillips' collection. A total of £8,861 was realized by 305 lots. A total of £32,408 was recorded at Christie's in July when gems came under the hammer. From an anonymous source a superb diamond pendant found a buyer at £9,500. At Sotheby's sale of the late H. K. Burnet's Chinese collection 405 lots obtained £6,131 13*s.* An early Chou wine vessel was knocked down for £230. Sotheby's in conjunction with Lofts and Warner sold the H. Yates Thompson collection, which achieved a total of £11,504 19*s.* (D. O.)

Arts and Sciences, American Academy of: *see* American Academy of Arts and Sciences.

Asbestos. Following are the salient data of the asbestos industry in the United States in 1940: production 19,174 short tons, sales 20,060 tons, imports 246,613 tons, exports

4,474 tons, available supply 262,199 tons; all figures are increases over preceding years. More than half of the world supply comes from Canada, where 1940 sales declined slightly to 345,581 tons. Second in importance is Southern Rhodesia, with 58,313 tons in 1939 and 1940 not reported. South Africa produced 27,392 tons in 1940 and exported 22,187 tons. Production was begun in Swaziland in 1939; no figures were available for the year, but output during the first seven months of 1940 was at the rate of nearly 2,000 tons monthly. Nothing was reported from Cyprus after the first quarter of 1940, and operations were probably discontinued. (G. A. Ro.)

Asbestosis: *see* SILICOSIS.

ASCAP: *see* PERFORMING RIGHT SOCIETIES; RADIO: *Literary-Musical Property.*

Ascension: *see* BRITISH WEST AFRICA.

Asia: *see* AFGHANISTAN; CHINA; INDIA, ETC.

Asphalt. United States production of asphalt includes only comparatively small amounts of the native varieties (32,000 short tons in 1940, against 37,360 tons in 1939). The production of bituminous rock rose from 422,484 tons in 1939 to 458,665 tons in 1940; this has an asphalt content of about 10%, and so accounts for a somewhat larger amount of asphalt production. Of far greater magnitude is the output of manufactured asphalt, which was recovered in the refining of petroleum to the extent of 5,069,823 tons from domestic and 1,289,132 tons from imported petroleum in 1940. There are moderate imports of both native and manufactured varieties, but these are more than offset by exports, especially of petroleum asphalt.

Trinidad is the world's largest producer of native asphalt, with an output of 130,315 long tons in 1939, but exports have declined nearly one-half since 1929, due largely to competition from petroleum asphalt. Egypt produces about the same amount as the U.S., and there are a number of minor producers. (G. A. Ro.)

Assassinations. The assassinations of 1941, actual or attempted, included the following:

PAUL COLETTE (centre) being held by French gendarmes immediately after his attempted assassination of Pierre Laval and Marcel Déat Aug. 27, 1941 at Versailles

March 11 Istanbul, Turkey. Time bombs hidden in suitcases exploded as British minister to Bulgaria, George W. Rendel, and his party of 67 entered hotel; Rendel escaped injury, but six of his entourage were killed and 17 injured.

May 24 Tirana, Albania. A Greek poet attempted to assassinate King Victor Emmanuel and Albanian Premier Shevket Verlaci during the former's visit to Tirana; the Greek fired several times into the king's motor car, but all his shots missed.

July 26 Near Montelimar, France. Marx Dormoy, former socialist leader and interior minister in the Popular Front cabinet of prewar France, was killed by a time bomb left by unknown persons in his hotel room.

Aug. 14 Tokyo. Baron Kiichiro Hiranuma, Japanese vice-premier, was shot in the neck and jaw by a 33-year-old assassin who forced his way into the baron's residence in Tokyo; the assailant was apprehended by the police.

Aug. 27 Versailles, France. Pierre Laval, former French premier, and Marcel Déat, pro-nazi editor, were shot and seriously wounded by Paul Colette, a young Frenchman, while they were reviewing a French anti-communist legion in a Versailles barracks.

Sept. 5 Paris, France. Marcel Gitton, French ex-communist leader and former deputy, died of injuries inflicted Sept. 4 by unidentified assailant.

Nov. 9 Baghdad, Iraq. Fakhri Bey Nashashibi, Arab leader and Head of Defense party, was assassinated as he was leaving his hotel.

Association for the Advancement of Science, American: *see* AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Astronomy. The importance of the Schmidt-type telescope as a new tool in astronomical research is emphasized by the number of these instruments placed in use or under construction during 1941. Two 24-in. Schmidt telescopes were installed in the United States, while two larger instruments were soon to be installed, one in the United States and one in South Africa.

Solar System.—*The Sun.*—One of the great unsolved problems concerning the solar spectrum has been the identity of the lines in the spectrum of the corona. It has been known that these lines, 22 of which have been measured by Lyot, could not be due to any unknown chemical element but must arise from well known elements under unusual conditions. Edlen, in the course of systematic studies of the spectra of highly ionized atoms, has succeeded in identifying 15 of these lines. Two of the lines are due to highly ionized atoms of calcium, seven are due to highly ionized iron and six to highly ionized nickel. The seven lines which remained unidentified in 1941 are all faint, the 15 identified lines contributing approximately 97% of the total radiation from the corona. Several of these identified lines have not as yet been observed in the laboratory, but enough was known about the highly ionized states of these atoms to make Edlen's predictions reasonably certain.

The variation of brightness over the solar disk from the centre to near the limb has been accurately measured, but unsteadiness of the image, due to the effect of the earth's atmosphere, makes such measurement difficult very close to the limb. The best means of escaping this difficulty is to measure the brightness of the crescent phases of a total solar eclipse. Ferwerda, Uitterdijk and Wesselink succeeded in doing this at the Russian eclipse of 1936 by an ingenious photographic method. Their results, published in 1941, indicate that the brightness near the sun's limb varies approximately as the tenth root of the distance from the limb, whereas the brightness nearer the centre of the disk varies as the cube root of this distance. Simultaneous measures of colour show that even during the last minute before totality, when the light was only 1/100 its initial value, there was no change of colour. This constancy of colour suggests that there must be a nearly isothermal layer near the solar surface. Similar results have been arrived at in different ways by Plaskett and by Miss Adam.

Planetary System.—Six comets were discovered during 1941. Two of these were rediscoveries of previously known comets, the others being new objects, one of which was readily visible to the naked eye in the southern hemisphere.

One of the great co-operative observational programs instituted by the International Astronomical union was the program for observing Eros at the opposition of 1931. At this opposition Eros was only 16,000,000 mi. from the earth, and this close proximity of Eros made it an especially favourable object to observe for the purpose of determining a new value of the solar parallax. Jones announced the results of his analysis of thousands of observations made at more than 30 co-operating observatories. After systematic errors of some of the observatories had been allowed for, he obtained the following values for the solar parallax: from all right ascension observations, $8''.7875 \pm 0''.0009$, and from all declination observations, $8''.7907 \pm 0''.0011$. He concluded that the solar parallax must be very close to the value $8''.790$. This material also yielded a new value of the mass of the moon. By using the value $8''.790 \pm 0''.001$ for the sun's parallax, Jones obtained for the ratio of the mass of the earth to that of the moon the value 81.271 ± 0.021.

A comparison of Newcomb's theory of the motion of Neptune with all observations from 1795 to 1938 has been made by Wylie. After reducing all positions to a homogeneous system he obtained corrections to the orbital elements of Neptune which have gratifyingly small probable errors. A by-product of this investigation is a new determination of the mass of Pluto, which Wylie found to be $(0.300 \pm 0.028) \times 10^{-5}$ sun's mass. The mass of the earth is 0.301×10^{-5} sun's mass. Pluto, therefore, appears to have a

AURORA BOREALIS outshone the brilliance of New York city's lights on the night of Sept. 18, 1941. The display was visible throughout much of the northern U.S.A.

mass practically identical with that of the earth.

Observations of the satellite of Neptune by Alden yielded a new value of the mass of this satellite. Alden finds that the ratio of the mass of the satellite to the mass of the system is 0.0013 ± 0.0003. Since the mass of Neptune is about 17 times that of the earth this figure makes the mass of Neptune's satellite 0.022 the earth's mass, or 1.8 times the mass of the moon.

Stars.—*Special Stars and Stellar Structure.*—In a study of the atmospheric structure of Zeta Aurigae, Roach combined his own photoelectric observations with those previously made by Guthnick and by Kron. After adjusting all observations to the same effective wave length, he found that they could best be represented on the assumption that the eclipse is due entirely to absorption of light of the B star by the extensive atmosphere of the K star. An estimate of the number of hydrogen atoms in the line of sight, based on observed intensities of the hydrogen lines in the spectrum, agrees well with the extinction theory of the eclipse.

One of the most interesting and puzzling of the eclipsing binaries is the third magnitude star Beta Lyrae. Thousands of photometric and spectrographic observations of this star have been made in an attempt to solve the puzzling problems it presents. A concerted attack on the problem by a number of astronomers seems to have pretty well solved the puzzle. Kopal and Kuiper treated the problem from the theoretical standpoint and Struve, Greenstein, Page and Miss Gill contributed spectrographic investigations. Notable among these are the discussions of Kuiper and Struve. Beta Lyrae consists of two highly elliptical stars which revolve about their common centre of gravity. Kuiper's mathematical analysis, when combined with Struve's spectrographic results, indicates that the two components of this binary system are so nearly in contact as they revolve about each other that their atmospheres merge. Because of different densities, the attraction of the more dense star on particles between the two will tend to set up a current in their atmospheres. Much of this moving gas will continue to circulate about the two stars, but some of it will escape and form a great spiral of gas about the stars which will take the form of a disk of material lying in the plane of the orbit. The plane of the orbit must be almost edgewise toward us so that the gas in this spiral will come between us and the stars. This is a remarkable model of a celestial object, but it depends on careful dynamical calculations and on a thorough study of the spectra. It explains almost all of the hitherto puzzling features of this system, combining the perplexing observational facts into a consistent and intelligible picture.

Observational investigations of Cepheids and cluster-type variables by Fath and by Schwarzschild indicated secondary periods in the light variations. Analysis of this material by Schwarzschild indicated that not only the fundamental mode of pulsation but also higher modes or overtones occur in these stars. Analytical solutions for a standard stellar model indicated the nature of the period-density relation which pulsating stars should follow if they pulsate in the first overtone of the fundamental period. Combining his observed mean colours and mean magnitudes of the stars in the cluster Messier 3 with new periods for these stars determined by Martin, Schwarzschild found an observed period-density relation for the shorter period stars which agrees well with the predicted relation. It appears, therefore, that the shorter period cluster-type stars pulsate in the first overtone of the longer observed periods for these stars. This conclusion is of considerable importance for the interpretation of the mechanism of pulsation.

Stellar System.—A survey of the proper motions of stars in the southern hemisphere, based on series of plates obtained at the southern station of the Harvard observatory, has been carried out by Luyten. The first results of this monumental task appeared during 1941, consisting of the proper motions of 28,505 stars between declination $-50°$ and the south pole. When completed, the analysis of Luyten's results will add very materially to our knowledge of stellar motions in our galaxy.

Determination of the distances of galactic star clusters involves considerable uncertainty due to absorption by interstellar matter. Cuffey studied three clusters in the uniformly rich region of the Milky Way in Monoceros and Canis Major and found that both the selective and general absorption in this direction is very small to a distance of 3,300 parsecs. The absence of appreciable absorption to this distance, coupled with the absence of extragalactic nebulae from these star fields, suggest that there must be considerable absorption at greater distances in this direction. This may indicate the existence of a spiral arm containing absorbing clouds and extending to a greater distance than the average radius of our galactic system would suggest.

Prediction of the presence of molecules of CH in interstellar space by McKellar was confirmed by Adams from high dispersion spectra of Zeta Aurigae. He found a number of additional interstellar lines and concluded that the existence of interstellar CH and CN seemed well established.

External Galaxies.—A new investigation of the dimensions and shape of the Andromeda nebula was made by Williams and Hiltner with a new direct-intensity microphotometer designed to trace isophotal contours. This instrument, called an isophotometer, was used to trace isophotal contours from a negative of the nebula obtained by Hubble with the 18-in. Schmidt telescope at Mt. Palomar. Previous measures of the extreme dimensions of the Andromeda nebula by Redman and Shirley gave $267' \times 89'$. Williams and Hiltner find the values $400' \times 91'$. Adopting currently accepted estimates of the distance of the nebula, the real diameter along the major axis must be at least 80,000 light years.

An investigation by Wyse and Mayall of the distribution of mass in the spiral nebulae Messier 31 and 33, based on radial velocity measures made

at varying distances from the centre of each nebula, indicated that the mass in each case is widely spread throughout the system, with very small concentration of mass at the centre. This result contrasts markedly with the high concentration of light near the centre and indicates that there is no apparent relation between mass distribution and the distribution of luminosity. Observations of the rotation of our own galaxy have heretofore been interpreted as indicating a high central concentration of mass. This may be true, but such an interpretation does not necessarily follow from the observations and the distribution of mass in our galaxy may be similar to that found in these two extragalactic spirals.

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(N. L. P.)

Athletics: *see* TRACK AND FIELD SPORTS; etc.

Athlone, 1st Earl of (ALEXANDER AUGUSTUS FREDERICK WILLIAM ALFRED GEORGE CAMBRIDGE) (1874–), British statesman, was born April 14 at Kensington palace, the third son of the 1st duke of Teck. Educated at Eton and the royal military college, Sandhurst, he served in Matabeleland, Southern Rhodesia, in 1896 and saw action during the Boer war, receiving the Queen's medal with five clasps. During World War I he was mentioned twice in dispatches, and in 1917 he was created 1st earl of Athlone. He was governor general of the Union of South Africa from 1923 to 1931. In 1931 he was made governor of Windsor castle, in 1932 chancellor of London university and in 1936 grand master of the Order of St. Michael and St. George. In the latter year he was also appointed personal aide-de-camp to the king. He was appointed 16th governor general of Canada April 3, 1940, to succeed the late Lord Tweedsmuir.

Atlantic Charter: *see* DEFENSE, NATIONAL (U.S.): *"The Atlantic Charter"*; ROOSEVELT, FRANKLIN DELANO; UNITED STATES: *Foreign Relations.*

Auchinleck, Sir Claude John Eyre (1884–), British army officer, was born in England, the son of Col. John Claude Auchinleck. He served in India in 1902, and was stationed in Egypt and Mesopotamia during World War I. In 1933 and 1935 he distinguished himself on the northwest Indian frontier in engagements with native tribesmen. In the spring of 1940 he was made commander of the Allied forces in northern Norway. He took Narvik but was forced to evacuate the city when the Allies failed to make additional landings in the south. In the summer of 1940, after the collapse of France, Auchinleck was appointed general officer commanding the English southern command, and he organized the first defenses of England to forestall the threatened German invasion. In Dec. 1940 he returned to India as commander in chief. In July 1941 he was made commander in chief of British middle east armies, succeeding Gen. Sir Archibald Percy Wavell (*q.v.*), who was transferred to Auchinleck's post in India. Auchinleck's armies in Libya, under Gen. Sir Alan Cunningham (*q.v.*), launched an offensive against axis forces Nov. 18, 1941. Auchinleck's plan to cut off axis supplies met with initial successes, but when the British desert armies were temporarily halted, Cunningham was replaced by Gen. Neil Methuen Ritchie (*q.v.*). Thereafter the British drive gathered momentum and Bengasi was captured Dec. 25, 1941.

Austin, Frederick Britten (1885–1941), British author and playwright, was born May 8 at Hackney Downs, England. The day after England declared war on Germany in 1914, Mr. Austin, then a stock exchange clerk, enlisted in the London rifle brigade. He served for 30 months with the British overseas armies and was demobilized in 1919 with the rank of captain. A keen student of military strategy, Austin predicted as far back as 1913 that mechanized armies would displace cavalry and infantry in future wars. This prophecy was made in an early novel, *In Action*, published in 1913. Among his other works are: *The Shaping of Lavinia* (1911); *Battlewrack* (1917); *The Road to Glory* (1935); and *Told in the Market Place* (1935). He died at Weston-super-Mare in Somersetshire on March 12.

Austin, Herbert Austin, 1ST BARON (1866–1941), British motor car manufacturer, was born Nov. 8 at Little Missenden, Buckinghamshire. Educated at Brampton college, he went to Australia where he served an apprenticeship in engineering at a Melbourne factory. He later went to work as a salesman and repairman for a sheep-shearing machine company. He returned to England in 1893, became interested in motor cars—then a pioneer industry—and designed and built his first car in 1895. In 1900 he became manager of a motor car factory and drove his own product, a Wolseley, in a 1,000-mi. endurance rally in the same year. In 1905, he formed the Austin company, which produced 50 cars the first year; by 1914 the plant was turning out 1,000 cars a year. During the war the factory was converted into a munitions plant. In 1922 Austin went back to motor cars and produced the first "Baby Austin." By 1927 the Austin works had turned out 100,000 of the cheap, 7-h.p. cars. Lord Austin gave more than $1,250,000 to the Cavendish Laboratory of Experimental Physics at the University of Cambridge. He was a member of parliament from 1919 to 1924 and was created first Baron Austin in 1936. He died May 23 at Lickey Grange, near Bromsgrove, Worcestershire.

Australia, Commonwealth of. A self-governing member of the British commonwealth of nations, situated in the southern hemisphere between longitudes 113°9′ E. and 153°39′ E. and latitudes 10°41′ S. and 43°39′ S.; national flag, a blue ensign, with the Union flag in the quarter and six white stars in the field. Ruler, King George VI; governor-general, the Rt. Hon. Lord Gowrie, V.C.; prime minister, J. Curtin; language, English; religion, Christian (census 1933: Anglican, 2,565,118; Roman Catholic, 1,161,455; Presbyterian, 713,229; Methodist 684,022; other Christians, 603,914).

Area and Population.—Area, 2,974,581 sq.mi.; population (est. Dec. 31, 1940), 7,068,689. Chief towns (pop. Dec. 31, 1940): Sydney (1,310,520), Melbourne (1,076,000), Adelaide (330,000), Brisbane (335,520), Perth (228,000), Hobart (66,620), Newcastle (116,000). Capital, Canberra.

History.—The political upheavals which were a constant threat to stable government throughout 1941 and which culminated in the downfall of the national government in September must have appeared to be strangely out of harmony with Australia's magnificent war effort to observers unfamiliar with the background of Australian politics. It is important therefore to record that the Labour opposition declared more than once in the most emphatic terms its determination to prosecute the war to its ultimate victory with all the vigour of which the nation was capable. The reason for Labour's persistent refusal to join in an all-party government must be sought in the history of a trade union movement of unbounded vitality and supreme confidence in the ability of the working class movement to undertake all the responsibilities of administration. It regards the United Australia party as representative of the bankers and industrialists and is unshakably convinced that the bankers squeezed the Labour administration out of office during the 1930 depression. It regards the building of an Australian nation, possessed of a standard of life hardly equalled anywhere in the world, as the achievement of a people possessed of initiative and vitality and capable through the Labour movement of leading the nation to victory.

CITIZENS OF SYDNEY borrowed a U.S. custom and threw paper and confetti for the first time March 20, 1941 to welcome the visiting crews of seven U.S. warships

In February, Prime Minister Menzies left Australia for a visit to the United Kingdom, inspecting the Australian imperial forces in the middle east en route. While in England he sat at meetings of the war cabinet, and postponed his departure in order to take part in vital decisions necessitated by the Greek campaign. During his absence A. W. Fadden, elected leader of the Country party in March, became acting prime minister. In March the Child Endowment bill, which had Labour's full support, was passed by both houses. The act provides for the payment of 5*s.* a week for every child after the first, and was estimated to cost £13,000,000 annually. The advisory war council was increased from 8 to 10 in order to permit the Labour nominee, Dr. Evatt, to join the council. Fadden again urged the formation of an all-party government, but the offer was rejected by the Labour caucus in May.

Menzies, after his return by way of the U.S.A., called for a more urgent war effort and announced drastic new measures by the government (see *Economic Affairs*, below) but was unsuccessful in inducing Labour to join the government. After the evacuation of Greece and Crete, there had been a general feeling in Australia that the commonwealth should have a more direct voice in discussions of major policy by the British war cabinet. As the other dominions did not appear to favour the formation of an imperial war cabinet, the most obvious solution was for the commonwealth prime minister to return to London, and that Menzies proposed. The suggestion was opposed, not only by Labour, but by some of Menzies' own party, and revealed the existence within the government ranks of a section who lacked complete confidence in Menzies' leadership. In the interests of national unity Menzies resigned his post in favour of Fadden, who was sworn in as prime minister on Aug. 31. Menzies retained his portfolio as minister for defense co-ordination, and no other cabinet changes were made. The Fadden administration lasted only five weeks. After surviving, by a majority of one, a vote of censure on the use of public funds for subsidizing anti-subversive propaganda, the government was defeated on its budget proposals by a majority of three, the two Independent members voting with the opposition. Fadden advised the governor-general to call upon Curtin, the Labour leader, to form a government and pledged the support of his followers so long as the new government vigorously prosecuted the war. Curtin announced that the change of government would not affect any diplomatic appointments and authorized Sir Earle Page, who was on his way to London, to continue his mission.

External Affairs.—Sir Bertram Stevens, former premier of New South Wales, was appointed Australian representative of the eastern supply group, Delhi, in Jan. 1941. In July, Sir Frederic Eggleston was appointed Australian minister to China and took up his post at Chungking.

Economic Affairs.—On his return from the United Kingdom and America, Menzies announced his "prospectus of an unlimited war effort." This program involved drastic control by the government of finance, trade and industry. The government was given powers to take over factories and plants and to decide what each organization should produce; a board was appointed to control and direct the production and distribution of coal. All interstate shipping was placed under government control, and all rail-road transport facilities were made subject to a federal executive body.

Side by side with such measures for the control and direction of the means of production the government had to face drastic changes in agricultural economy necessitated by shipping shortages, particularly of refrigerated space. Plans included the establishment of new secondary industries for the canning of meat, sausages and bacon, and the production of meat concentrates and dried eggs. Cheese and dried milk production had to be increased to replace butter exports. As stated by the minister of commerce (Sir Earle Page): "Our entire agricultural economy is being planned and streamlined to meet the needs of war."

Total war expenditure for the financial year 1940–41 was £181,000,000, of which £11,000,000 was recoverable for services and supplies on behalf of other governments. This compared with the estimate of £186,500,000. Of this sum, £65,000,000 was provided from revenue. The total non-war expenditure from revenue was £85,400,000. Total revenue was £3,000,000 above the estimate. In presenting his budget for 1941–42 on Sept. 20, Fadden (prime minister and treasurer) announced that, despite Lend-Lease aid, expenditure for 1941–42 was estimated at £217,000,000, of which £160,000,000 would be expended in Australia. Expenditure on all

services other than war was estimated at £102,300,000. After providing for non-war services, only £63,000,000 was available from revenue for the war cost of £217,000,000. The treasurer proposed to borrow £122,000,000 from the public and banking system and to raise £32,000,000 by new taxation and wartime contribution, which involved a system of compulsory savings to be levied on every income. However, the government was defeated on its budget proposals and at the close of the year it remained to be seen how the new treasurer, J. B. Chifley, proposed to meet the gap between revenue and proposed expenditure.

Education.—In 1937: state schools, 10,205; average attendance, 768,848; private schools, 1,880; average attendance, 210,101; technical education, net enrolments, 102,496; business colleges, average attendance, 21,139; universities, number of students, 11,098.

Defense.—The year 1941 witnessed for the most part the development, intensification and extension of plans which had been prepared during the earlier months of the war. In addition to maintaining reinforcements of men and material for the Australian imperial forces in the middle east, a large contingent was dispatched to Singapore in February for service at various stations in the Malay peninsula. Further contingents arrived there in August and October.

In January the government announced its intention to raise and equip an armoured division, fully equipped with tanks and more than 1,000 other armoured vehicles, and with a personnel of more than 10,000 officers and men. Training was proceeding at the end of the year.

A 3rd Forestry company arrived in England in July to join the two companies which had been sent there for service during the previous year.

The Australian imperial forces played a prominent and valorous part in the campaigns in Greece, Crete, Libya and Syria. According to revised records received from General Blamey in June the Australian casualties in Greece and Crete numbered 261 officers and 5,690 men. Seven medical officers and 150 other ranks voluntarily stayed behind in Greece to care for the wounded.

Lieut.-Gen. Sir Thomas Blamey, general officer commanding the Australian imperial forces, middle east, was appointed deputy commander in chief, middle east, in April and was promoted to the rank of general in September.

Because of the increased tension in the Pacific, the government plans for the building of a fully-trained home army of 250,000 were accelerated. In February, the army minister announced that military camps would be extended from 70 to 90 days and that in the future more than half of the total personnel of the military forces would be in camp.

The government decided to appoint a commander of home forces, and in August General Sir Iven Mackay was recalled from the middle east to take over this command. It was estimated that at the end of the year the strength of the Australian imperial forces stood at 200,000 and the total armed forces in the commonwealth at more than 250,000.

In March, Vice-Admiral Sir Guy Royle was appointed chief of the Australian naval staff in succession to Admiral Sir Ragnar Colvin.

The training of air personnel for the expanding royal Australian air force and for the empire air training scheme proceeded ahead of schedule. Most of the advanced training was being completed in Australia in 1941 instead of in Canada as originally planned. The first personnel to complete their training in Canada arrived in the United Kingdom on Christmas day 1940, and the first contingent of those who completed their training in Australia arrived in Feb. 1941. From that date they were arriving in ever-increasing numbers almost weekly. By October, 205,000 volunteers had enlisted in the R.A.A.F. and for the empire air training scheme and more than 50,000 had been selected for training. In June the government decided to form an R.A.A.F. cadet corps to consist of 78 squadrons, which was to provide for the training of 20,000 boys between 16 and 18.

In spite of the drain of man-power necessitated by the maintenance of military forces, remarkable developments in the industrial sphere of war production were achieved. Before the war there were only five manufacturers of machine tools in the commonwealth; in 1941, 85 firms were engaged in producing all classes of jigs and precision tools. Besides ammunition of all kinds, Australia in 1941 produced hand grenades, aircraft bombs, naval mines and gun forgings and manufactured guns and engines for the royal navy. Anti-aircraft guns, Bren guns and 25-pounder howitzers were being turned out in increasing quantities. One thousand Australian-produced aircraft were actually in service by October. Among the many naval vessels launched from Australian shipyards during the year was included H.M.I.S. "Punjab" for the Indian navy.

Banking and Finance.—Revenue (actual 1940–41), £A150,500,000; (est. 1941–42) £A195,000,000; expenditure (actual 1940–41) £A150,500,000; ordinary (est. 1941–42), £A102,306,000; defense, £A95,000,000; public debt (June 30, 1941), £A1,426,000,000; notes issued (July 7, 1941), £A67,000,000; gold and sterling reserve (Dec. 31, 1940), £A17,705,000; exchange rate, £A125=£100 sterling.

Trade and Communications.—Overseas trade 1940–41 (merchandise): imports, £A136,300,000; exports, £A136,400,000; (bullion and specie 1938–39): imports, £A3,562,000; exports, £A18,963,000. Communications and transport: 1939, roads, total mileage, *c.* 500,000; metalled, *c.* 200,000 mi.; railways open to traffic, 27,961 mi.; airways (1939–40), distance flown, 12,822,751 mi.; passengers carried, 142,797; goods carried, 1,770,738 lb.; mails carried, 416,996 lb.; shipping with cargo and in ballast, in net tons, entered (monthly average 1938–39), 558,000; (monthly average 1939–40), 508,000; cleared (monthly average 1938–39), 553,000; (monthly average 1939–40) 502,000; motor vehicle registrations (March 31, 1941): cars, 548,451; commercial vehicles, 263,219; cycles, 72,923; wireless receiving set licences, 1,282,787; telephones, number of lines, 520,037.

Agriculture, Manufacturing, Mineral Production.—Production (in metric tons): wheat (1940–41), 2,286,000; gold (1939), 51,187 km.; wool (1940), 512,800; cane sugar (1939–40), 943,000; coal (1939), 12,438,000; lignite (1939), 3,720,000; iron ore (metal content) (1938), 2,287,000; pig iron and ferro-alloys (1938), 945,000; wine (1938–39), 680,000 hectolitres; oats (1938–39), 282,000; barley (1938–39), 245,000; maize (1938–39), 179,000; potatoes (1938–39), 278,000; butter (1939–40), 216,900; lead (smelter production) (1939), 185,000; zinc (smelter production) (1938), 70,000; copper (smelter production) (1938), 17,400; tungsten ore (1938), 540; antimony ore (1938), 900; silver (1939), 385. Labour and employment: employment in factories (1928–29=100) March 1941, 151.5; number (average March 1941), 654,500; unemployment, trade union returns (March, 1941), 5.3%; recorded material production (1938–39), £A464,993,000. (W. D. Ma).

Australia, South: *see* South Australia.

Autobiography: *see* American Literature; English Literature; etc.

Automobile: *see* Motor Vehicles; Motor Transportation.

Automobile Accidents: *see* Accidents; Disasters; Insurance, Automobile.

Automobile Racing.

Once again the annual Memorial Day 500-mile Indianapolis classic was the high light event of the auto racing featured during 1941. This time it was particularly noteworthy because two drivers shared the distinction of piloting the winning car. While 160,000 enthralled spectators watched, probably the largest crowd ever lured to the event, Mauri Rose of Indianapolis and Floyd Davis of Springfield, Ill., successfully combined their skill and courage to achieve the victory. They drove their car at a speed of 115.117 miles per hour over the 500-mile distance to share first prize money, totalling $29,985. They are listed in the record books as co-winners.

Davis, famed dirt track contestant, started the race in the winning machine owned by Lou Moore, retired Indianapolis driver. Rose, one of the most consistent finishers in speedway competition, relieved Davis at 177½ miles after Rose's own car, of which Moore was the manager, was forced out at the 152-mile mark by carburettor trouble.

Fifteen of the thirty-one starters, comprising the fixture's smallest field since 1936, completed the race. The runner-up for the second successive year was Rex Mays of Glendale, Calif., who was more than two and one-half miles behind Rose at the end.

Harley Taylor of Atlanta, Ga., set a record for 50 miles in a stock car on a dirt track by doing 100 laps on the half-mile Southern States fair grounds track at Charlotte, N.C., in 59.54.3. Ray Hall of the same city, won the 200-mile stock car auto race at the Langhorne, Pa., speedway, averaging 69 miles per hour.

The midget automobile racing tracks again proved popular centres of entertainment for thousands of fans in numerous cities and towns.

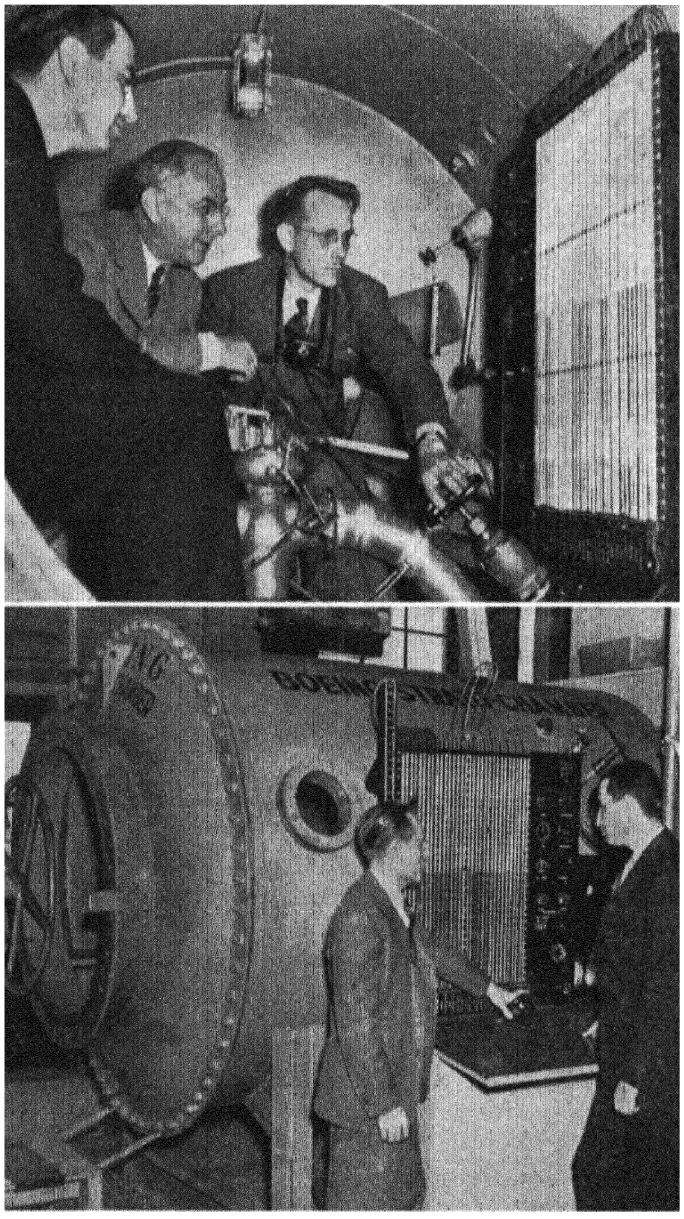
Among the leaders of feature events in the midget class was Mike Joseph who set a new record for 20 laps at the New York coliseum in 3.37.42. Another winner was Lloyd Christofer of Miami, Fla., who won the Union, N.J., 25-lap midget feature in 5.47.85.

Foremost among those involved in accidents was Wilbur Shaw of Indianapolis, victor in 1937, 1939 and 1940. Seeking to become the lone four-time winner, Shaw was leading when he crashed into the wall at the 300-mile mark. The noted pilot escaped serious injury.

Mays, with his second at Indianapolis and firsts at Milwaukee, Wis., and Syracuse, N.Y., retained the American Automobile association national point championship. He was credited with 1,225 tallies. (T. J. D.)

Aviation, Civil.

With the exception of activities in North and South America, and a few international air lines such as Pan American Airways and K.L.M., civil aviation continued to diminish in 1941 from previous years. In nations



A STEEL "strato-chamber" demonstrated in 1941 reproduces conditions of high-altitude flights. The upper picture shows a test being conducted inside the chamber, which simulates the interior of a high-flying plane and is equipped with air pumps, recording instruments, pressure controls and a dry-ice refrigerating plant. Below is an exterior view of the three-ton laboratory tank

at war, military aviation completely dominated all phases of what had previously been civil aviation.

International Transport.—With the war spreading to new countries, some air transport routes died a quick death, while others, just as suddenly, made their appearance for the first time. As the theatre of war shifted from one stage to another, so did air transport systems change their routes and terminals.

The outstanding name in international air transport in 1941 was that of Pan American Airways. In addition to flying its previously established routes through Mexico, Central and South America, to Alaska, and across both the Atlantic and Pacific, Pan American, at the request of both U.S. and British governments, established a new route across the South Atlantic to several cities in the interior of Africa. As the year closed routes were extended across Africa, the Indian ocean and Burma to China.

On Aug. 18, after his meeting at sea with Prime Minister Churchill, President Roosevelt announced that Pan American Airways would shortly begin operations of a new air line between the U.S. and Africa. In less than three months the new line was in operation. Planes flew from Miami, Fla., down the east coast of South America to either Trinidad or Natal, Brazil, and across the South Atlantic to various bases on the west coast of Africa and thence to Khartoum, Cairo and other African cities. It is this route which was extended to connect with Singapore and other points in that general area after the U.S. entered the war in Dec. 1941.

The U.S.-New Zealand route was kept open after war began, but the Pacific service beyond the Hawaiian Islands to the Philippines and China was discontinued.

Until the outbreak of war, Pan American's Atlantic service was one of the most outstanding jobs ever done by any commercial air line. In December the 500th crossing was made since the line was inaugurated in May 1939. During 1941 passenger miles flown on this route increased from 13,000,000 in 1940 to 23,600,000. Miles flown had jumped to 1,200,000 from 500,000 in 1940. This route had become the only fast scheduled run in operation, as the sailing of steamships was irregular.

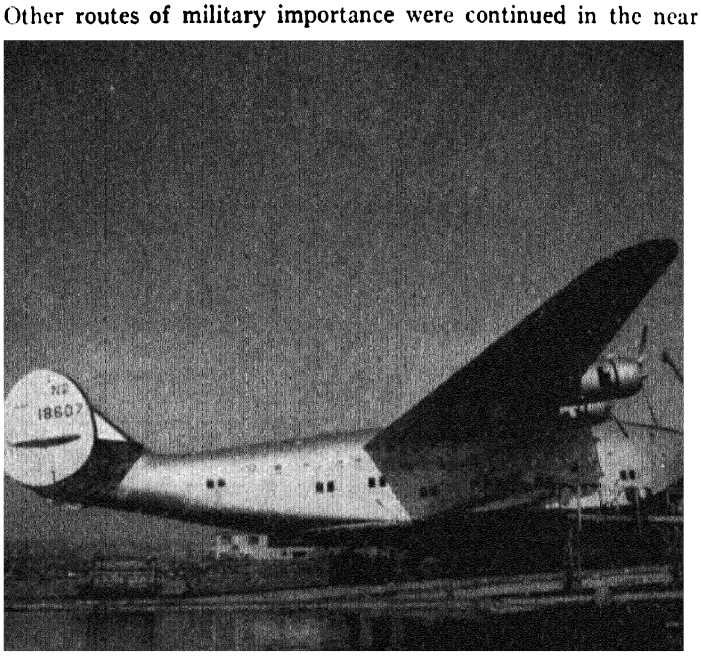
In Central and South America Pan American's activities also increased. Miles flown were 5,815,000 compared with 4,019,074 in 1940. Passengers carried increased from 89,650 to 107,580. There was a 63% increase in air express carried, from 579,000 to 950,000 lb.

The Brownsville-Guatemala-Canal Zone-Trinidad trunk line was placed on a daily basis and passenger traffic increased 20% and express volume more than doubled. Pan American-Grace activities along the west coast of South America were enlarged by the addition of approximately 50% more mileage. Panagra's 1941 operations included 2,267,000 revenue passenger miles, compared with 1,530,000 in 1940; mail carried was 157,000 lb., compared with 112,000 the year before; revenue passengers carried were 29,600, compared with 14,660 in 1940; express of 466,000 lb. compared with 170,000 in 1940.

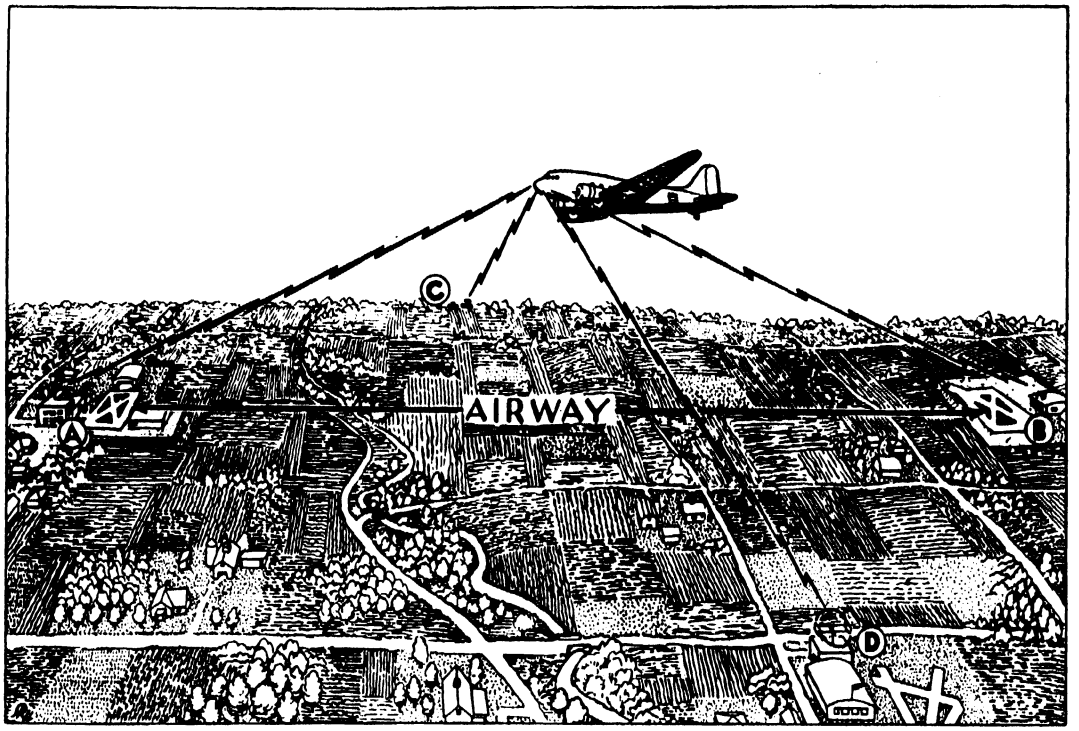
The air line took over the operations of several former German and Italian lines in South America and also carried out a huge airport building program, particularly along the east coast.

Service across the Pacific and the route from the U.S. to Alaska operated at new highs in 1941. Both services played a critical role in carrying military and important civilian personnel to strategic spots.

British Overseas Airways continued to operate a number of its international routes. During 1941 some 4,000 passengers were carried between England and Lisbon, plus 13,500,000 letters. Other routes of military importance were continued in the near



THE FIRST OF A FLEET of larger and improved Boeing clippers for transatlantic flights was launched March 17, 1941 at Seattle, Washington



AN AUTOMATIC DIRECTION FINDER installed on airways in 1941 enables ground personnel to "spot" the exact position of a plane in flight. When the pilot uses his microphone, a compass reading of his plane is recorded automatically at four stations (A, B, C and D in the diagram). Any two of these stations can then determine by triangulation the plane's position

east as well as the far east. The line purchased three Boeing clippers from Pan American Airways which were used for special missions. It was one of these large flying boats that was used to carry Prime Minister Churchill back to England after he visited the United States and Canada.

The Royal Dutch Airline, known as K.L.M., together with its affiliate K.N.I.L.M., continued to render yeoman service to the Allied cause. One branch of the line ran between England and Portugal. A twice-weekly service was run between Lydda, Palestine, and Sydney, Australia. Stops were made at Baghdad, Basra, Bahrein, Karachi, Jodhpur, Calcutta, Rangoon, Medan, Singapore and Batavia. From Batavia, the operating centre, the route continued on to Australia with stops at Surabaya, Bali, and Timor. Other important routes connected Batavia with Balikpapan and Tarakan, as well as with other cities among the islands. How much of its routes would be flown in 1942 depended on the spread of the war. With pilots from the Netherlands East Indies air force winning praise for their gallant deeds, it should be added that their brother pilots flying commercial transports were also doing admirable work for the Allies.

German Lufthansa flew fewer schedules in 1941 than in the preceding year. The German air transport system received a setback from the Russian campaign from which it had not recovered at the close of 1941. With shortages in both men and materials developing, fewer commercial passengers were carried on its air lines. Domestic routes continued to be flown, as well as the international runs to Sweden, France, Spain and Italy. Few figures were available. German lines in South America were taken over by either local countries or by Pan American Airways.

Air France flew a few local routes in 1941 as did Sweden. Italian planes flew commercial passengers to Lisbon, but elsewhere the military authorities occupied most of the space. In Finland, Hungary and Rumania air transport was strictly a military affair. Russian commercial transport continued to function although a high priority was given to passengers travelling for military or defense purposes.

In China, the China National Aviation corporation, jointly owned by the government and by Pan American Airways, carried on its work under the most difficult conditions. With the advance of the Japanese forces, the C.N.A.C. operating and maintenance base was moved on several occasions. The pilots, largely American, won great praise for their cool work in evacuating key military and civilian personnel from dangerous areas.

In Canada, Trans-Canada Air Lines had its most active year. Some 118 miles of new routes were added between Moncton and the great air base at Halifax. New runs were also added on several routes, including Toronto-New York. At the beginning of 1941 the line operated 15,000 miles per day, but by the end of the year it was operating 19,000 miles per day. The number of passengers carried per month doubled during the year; mail increased from about 83,000 lb. per month to 140,000 lb. and air express almost trebled. The line anticipated services to both Newfoundland and Alaska in the near future.

Domestic Air Transport in the U.S.—With increased preparations for war taking place throughout 1941, commercial air lines were the busiest in their history. Approximately 4,500,000 passengers were carried as compared with 3,185,278 in 1940. Distances flown increased from 119,517,263 miles in 1940 to about 150,000,000 miles in 1941. The fatality rate per 100,000,000 passenger miles declined from 3·05 in 1940 to 2·20.

Air express increased from 14,188,178 lb. in 1940 to more than 22,500,000 lb. in 1941. Air mail totalled 45,450,000 lb. compared with 33,800,000 in 1940. Profits were stated to be the best in history for most domestic air lines.

Many new routes were asked for by the air lines, but relatively few were approved by the Civil Aeronautics administration. After war had been declared CAA advised that no new routes would be approved unless they were clearly of value to national defense.

During 1941 there was a shortage of aeroplanes on nearly every U.S. air line. With steadily growing traffic, the lines had ordered relatively large numbers of new aeroplanes for 1941. Army and navy priorities on transports of approximately the same type kept the air lines from getting their ships. As a result, it was necessary for the lines to practise intensive maintenance to keep their transports flying. Formerly much maintenance was done in the daytime with spare aeroplanes. Since the heaviest schedules are flown in the daytime, it became necessary to do considerable maintenance work at night. However, maintenance standards did not decrease and safety records actually improved.

For the year 1942 the domestic air lines were allotted 112 aeroplanes. It seemed probable that most of these would be delivered to the lines, since the lines were an adjunct of the war machine. In carrying key personnel of both the government and defense industries, the air lines performed a valuable service. In World War I if an important governmental official had wanted to travel from New York to San Francisco the trip would have required at least five days. In 1941 he could have done it overnight, thanks to the commercial air lines.

The air lines were still ostensibly under the Civil Aeronautics

administration. Actually CAA was controlled by a general of the war department. Air transports might be commandeered for army duty at a moment's notice. It was expected that space on transports would be controlled, with a priority being given to military personnel and persons holding important government and defense jobs.

Civilian Flying in the U.S.—"The year 1941 was the greatest in the history of American aviation," stated Robert H. Hinckley, assistant secretary of commerce for air. The nation's civilian pilot roster passed the 100,000 mark, an increase of 60% over the 1940 figure of 63,113. The growth was accounted for largely by the training program of the Civilian Aeronautics administration. By the end of the year the army and navy were getting about one-third of their flying cadets from the ranks of CAA trainees. In addition about 2,800 CAA instructors joined defense units in the U.S. and Canada. A new program of training 3,200 instructors was under way.

During 1941, 30,000 young men completed elementary courses, with 9,800 still in training at the end of the year. Some 6,000 pilots passed the secondary course, and 3,000 were still in training. Instructor and refresher courses were given to 6,000 pilots. There were approximately 550 ground schools and 600 flight schools operating.

The number of certificated civil aircraft increased from 17,500 to approximately 27,500 during 1941. A large part of this gain was accounted for by training planes used in the CAA program. "Certificated" planes included all those registered with the government but did not include military planes or experimental models.

Up until the time war was declared by the U.S. the private pilot in the U.S. had the greatest of freedom. On the day following the declaration of war all private and commercial licences, except those of air-line pilots, were cancelled. Then re-licensing was resumed but noncitizens and Japanese were forbidden to fly. Flying was also greatly restricted in a zone extending 150 miles from both the east and west coasts, from Canada to the southern border. If a pilot wished to fly more than 10 miles from his home airport he had to file a flight plan with the army and have it approved. Any flying over certain zones was prohibited.

The civil air patrol was formed late in the year. Approved by CAA and by pilots' organizations, it provided for various phases of air activity by civilian pilots. Some indications pointed to the possibility that all civilian flying might be done under its jurisdiction.

Production of Civil Planes.—In 1941 approximately 8,000 aeroplanes were built in the United States for civil purposes. This number was the greatest in history and compares with 6,748 in 1940.

Technical Developments.—In the light plane field there were few changes in design over 1940 models. A few new aeroplanes were introduced, one of the most prominent of which was the General Aircraft corporation's "Skyfairer." This was a two-control aeroplane, having only ailerons and elevator, but no rudder. It had a tricycle landing gear and was both spinproof and stallproof. It more nearly approached a "foolproof" aeroplane than any other designed in the U.S. Originally designed as an all-metal aeroplane, its producers were forced to re-design it for wood and fabric.

The few that were built attracted considerable favourable attention.

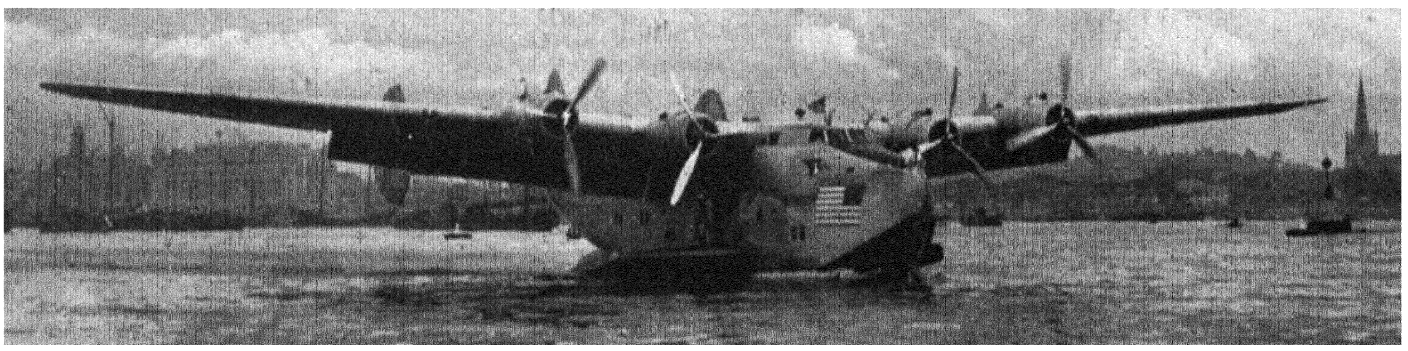
Another new aeroplane was the Langley plane, with two 65- or two 75-h.p. engines and a cabin seating four. Most interesting feature of the plane was its plastic-bonded plywood construction. Both fuselage and wings were entirely of plywood.

There were three large aeroplanes under construction of interest to the air lines. The Vought-Sikorsky VS-44A flying boats for American Export Airlines attracted much attention as the first was launched just after the end of 1941. These were 4-engined flying boats that could carry 40 passengers, including a crew. Speed was about 200 m.p.h. for cruising and the range was 3,000 miles. Maximum nonstop range under special fuel and load conditions was 6,000 miles. The hull was 80 ft. in length and the wing span was 124 ft. Engines were 1,200-h.p. Pratt & Whitney.

Another new aeroplane announced during 1941 was the Lockheed Constellation, developed by Lockheed for TWA and Pan American Airways. The first ships were begun but not finished in 1941. This was a 57-passenger land plane, powered with four 2,500-h.p. engines, which would boast the phenomenal speed of 350 m.p.h. Cruising speed was expected to be about 283 m.p.h. This would bring Los Angeles within 8½ hours of New York. The cabin and engines were supercharged. The first of this new type should be test flown in 1942.

Several of the Douglas DC-4 aeroplanes were under construction in 1941. The original DC-4 was designed around the specifications of several U.S. air lines, but when the prototype was completed it was not what the lines wanted. The original was flown for several months in the U.S. and then sold to Japan. The new DC-4 was a smaller aeroplane, although still powered with four engines. The ships under construction in 1941, although designed for air-line use, were expected to be taken over by the army for transport work.

In the field of engines considerable technical developments were made but the newest engines were being used in military planes and progress cannot be discussed. These developments were expected to lead directly to improved commercial engines both during and after the war. The development of the turbo-supercharger, for example, used on high-flying fighters and bombers, would also be a valuable addition to pressurized transport ships of the future. (*See* also AIR FORCES OF THE WORLD; AIRPORTS AND FLYING FIELDS; BUSINESS REVIEW: *Industrial Groups;* MEDICINE; PETROLEUM; POST OFFICE: *United States;* PSYCHOLOGY.) (C. N.)



THE PAN AMERICAN CLIPPER "California" landed at Singapore May 10, 1941 to inaugurate a regular fortnightly schedule between the U.S.A. and British Malaya

Aviation, Military: *see* AIR FORCES OF THE WORLD; BLOCKADE; GLIDING; MARINE CORPS; MUNITIONS OF WAR; PSYCHOLOGY; WORLD WAR II; *see* also under various countries.

Avila Camacho, Manuel (1897–), president of Mexico, was born at Teziutlan in the state of Puebla on April 24. After completing a course of commercial studies in his native town, he joined the successful revolution against Victoriano Huerta in 1914 and was promoted through various grades in the army to the rank of general of division. In the cabinet of President Rodriguez he was minister of war and navy. President Cárdenas later appointed him secretary of national defense and personally selected him as successor to the presidency. He was elected president July 7, 1940, by 2,476,641 votes to 151,101 for his opponent, Gen. Juan Andreu Almazán, according to tabulations of the Mexican congress. The new president was inaugurated Dec. 1, 1940.

In 1941, the first full year of Avila Camacho's presidency, there was unusual political quiet and harmony in Mexico. The chief untoward incident occurred Sept. 23, when troops fired into a crowd of munitions workers demonstrating before Avila Camacho's home in protest against labour conditions. During 1941, he negotiated a settlement of the oil-expropriation controversy with the United States. He consistently stressed hemispheric solidarity in defense and on Sept. 1, 1941, pledged the Mexican armed forces to that end. He added, however, that his country's great desire was to stay out of the war. (*See* also MEXICO.)

Azores, The: *see* PORTUGUESE COLONIAL EMPIRE.

Bacon. Although the production of almost all widely used food products increased in the United States in 1941, the output of bacon decreased. Sliced bacon, which had grown steadily in popularity for several years, was lower by approximately 500,000 lb. than in 1940. The output of government-inspected sliced bacon in the first 11 months of 1941 was 292,201,165 lb. compared with 292,780,137 lb. in 1940. In contrast, restrictions in consumption of bacon and other pork products continued in Canada in order that the dominion might maintain its shipments of bacon, ham and pork cuts to Great Britain. American-type bacon, unlike other United States meat products, never achieved popularity outside the U.S., and there was little demand for it to be included in the huge lend-lease shipments of food to Great Britain. Canada, at the end of the first two so-called "bacon agreements," Nov. 1939 to Oct. 1941, had shipped 756,000,000 lb. of bacon, ham and pork cuts to the United Kingdom and was to ship 600,000,000 lb. more in 1942. Other U.S. meat products were in demand for export, and a total of 1,014,846,403 lb. of canned meats and meat products was produced in the first 11 months of 1941, compared with 661,474,977 lb. in the first 11 months in 1940. Canned pork constituted 396,762,028 lb. of this output in 1941 and 251,096,103 lb. in 1940. Canned meat loaves, head cheese and chili con carne made up 130,132,859 lb. of the production in 1941 and 110,294,541 lb. in 1940.

(*See* also HOGS; MEAT). (S. O. R.)

U. S. Output of Government-Inspected Sliced Bacon by Months, 1941 and 1940

Month	1941 lb.	1940 lb.
January	25,301,058	24,778,179
February	21,788,563	21,755,898
March	23,136,684	23,306,006
April	23,652,679	26,503,341
May	27,043,376	26,857,536
June	27,465,777	27,450,204
July	29,932,191	30,525,151
August	29,335,189	30,898,065
September	29,638,038	28,227,275
October	29,333,721	27,487,836
November	25,573,889	24,899,646

Bacteriology. The spread of infectious agents through by droplet infection was given study in 1(The possibility of sterilizing air has been attempted by irra tion with ultraviolet light and by means of germicidal m or aerosols. The theoretical basis for the high bacterial ac ity is accounted for by the small quantity of germicidal ag which may be dispersed through a large enclosed air space. ' because each droplet of the aerosol contains the same concen tion of effective chemical substance as does the parent solut the bactericidal agent is enabled to act in high concentrat on bacteria suspended in the air. One part by weight of pro ene glycol in 2,000,000 volumes of air effected complete s ilization of an atmosphere containing as many as 200,000 b teria per cubic litre of air within a few seconds. Pneumoc types I and III, haemolytic streptococci, haemolytic staphyloco *Streptococcus viridans, Bacterium coli* and *Micrococcus catarr lis* have been tested and found to react similarly.

Influenza is caused by infectious agents (filterable virus which pass through filters that screen out bacteria. There apparently many separate viruses which may cause the same t of symptoms and the alphabet is used to designate them. T there have been described influenza A virus and influenza B vir A new strain of the virus of influenza B has been isolated fr the throat washing of a case of influenza during an epidemic California. Attempts to immunize large groups of people in stitutions with influenza A virus have been made using a vacc prepared from chick embryos inoculated with both influenza A rus and canine distemper virus. In volunteers who had receiv a single subcutaneous injection of complex vaccine of good ar genic potency four months previously, the incidence of influer A during an epidemic was 50% lower than among unvaccinat individuals in identical environmental circumstances. The in dence of influenza of unknown cause was not significantly diff ent in the two groups.

Microorganisms have been isolated which possess the power preventing the growth of or killing other bacteria. One of the microorganisms is *Actinomyces antibioticus*, which was isolat from the soil. Two active substances have been isolated in cry talline form from this microorganism, one which prevents bacte from growing whereas the other kills them. These substances a poisonous to animals when injected intravenously, intraperiton ally or intramuscularly.

The western strain of virus which causes sleeping sickness horses and man was isolated in a naturally infected prair chicken. This constitutes the first time that this virus has be reported in a host other than man and horses, coincidental wi a human epidemic in time and place.

Spotted Fever.—The popular conception that Rocky mounta spotted fever is a more virulent and, therefore, a more high fatal disease in the west than in the east was shown not to b true. One reason which was thought to account for this differen was that the wood tick, *Dermacentor andersoni*, carried the vir lent western virus whereas the dog tick, *Dermacentor variabili* which is common in the east, was held responsible for carryin the strain of lesser virulence. During 1941 some doubt was ca upon this theory since a highly pathogenic strain of Rocky mou tain spotted fever was isolated in *D. variabilis* territory in th east from which *D. andersoni* had never been reported. Also strain of very low virulence was recovered from a patient wh acquired the tick in *D. andersoni* territory in the west, from whic *D. variabilis* had never been reported. (*See* also EPIDEMICS AN PUBLIC HEALTH CONTROL.) (G. M. DA.)

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Baden-Powell, Robert Stephenson Smyth Baden-Powell,

1ST BARON (1857-1941), British army general, naturalist, actor, writer, sculptor and founder of the Boy Scout movement, was born Feb. 22 in London. A tireless traveller, he visited the United States on three occasions—in 1912, 1930 and 1935—and knew Africa as well as he did his native England. In 1937 ill-health forced him to abandon his active life in London and he returned to Africa to spend his last days. Some of his later works, several of which he illustrated, were: *Scouting and Youth Movements* (1929); *Lessons from the 'Varsity of Life* (1933); *Adventures and Accidents* (1934); *African Adventure* (1936); *Birds and Beasts in Africa; Life's Snags; Scouting for Boys; Girl Guiding; Official Handbook* (1938); and *More Sketches of Kenya* (1940). He died Jan. 8 at Nyeri, his home in Kenya colony, and was buried on the slopes of nearby Mount Kenya. (See *Encyclopædia Britannica.*)

Badminton.

Badminton's leading man continued to be David Freeman, of Pasadena, Calif., who retained the men's national championship for the third successive year. Freeman, a 20-year-old student at Pomona college, Calif., was formerly a tennis player of international note. He defeated Carl Loveday, of Montclair, N.J., for national honours, although the latter won the Metropolitan (New York), eastern and New England titles.

Miss Thelma Kingsbury, former English women's champion, became the women's national badminton titlist, defeating Miss Evelyn Boldrick, of San Diego, Calif. Freeman and Miss Kingsbury won the mixed doubles titles. Freeman and Chester Goss, also of Pasadena, and Miss Kingsbury with Miss Janet Wright, of Oakland, Calif., made a clean sweep by winning the doubles championships. Miss Mary Hagan won the Metropolitan and eastern titles.

Central "Y" won the men's class-A team title of the Metropolitan Badminton association. Spencer Davis, a Princeton sophomore at the time of his victory, captured the eastern intercollegiate title. (J. B. P.)

Baer, William Jacob

(1860-1941), U.S. miniature painter, was born Jan. 29 in Cincinnati, Ohio. One of the founders of the American Society of Miniature Painters, Baer became an associate member of the National academy in 1913. Many of his miniatures are in private collections in the United States and Europe. He died in East Orange, N.J., Sept. 21. (See *Encyclopædia Britannica.*)

Bagby, Albert Morris

(1859-1941), U.S. pianist and originator of the Bagby morning musicales in New York city, was born April 29 in Rushville, Ill. In his youth he studied music under Franz Liszt at Weimar, and he wrote many articles on the Hungarian composer. Urged by New York society women to organize his own subscription-musicales, Bagby in 1891 started his Monday morning musicales at his studio. He had such success that in later years he moved to quarters which could accommodate as many as 1,800. Bagby died in New York city, Feb. 26.

Bahamas.

A British colony and island group lying east and southeast of Florida, with an appointed governor and legislative council and an elected assembly. Area: 4,375 sq.mi.; pop. (1939 official est.): 67,729 (1931 census: 59,828); capital: Nassau (pop. 19,756); governor: H.R.H. the duke of Windsor.

History.—Bahamian development during 1941 centred primarily about World War II and issues affected by it. Extensive gifts in metals, money and foodstuffs were made to the empire cause, along with a loan of £100,000 free of interest for the duration of the war. Under war conditions the colony experienced serious difficulties in the maintenance of regularly scheduled shipping connections with the United States; nevertheless, the tourist trade boomed. In September the United States naval and air base on Great Exuma Island was formally taken over by that country, although construction was not yet complete.

THE DUKE OF WINDSOR, governor of the Bahamas, and the duchess greeting crowds in Chicago as they were en route to their ranch at Calgary, Canada in Sept. 1941

Education.—Education is compulsory. In 1939 there were 64 government schools, with 10,376 enrolment; 56 "aided schools," with 3,021; an industrial school with 103 pupils; and 49 denominational and private schools with 2,710. A government high school and three denominational schools provide secondary education.

Finance.—The monetary unit is the pound sterling (about $4.03½). The colony's public debt as of Dec. 31, 1939, was £253,000.

Trade.—In 1940 imports were £1,284,417 in value, exports £229,140, compared with £1,094,170 and £180,281, respectively, in 1939. The expansion of external trade continued in 1941 with 33% more imports and more than 50% more exports during the first three months than in the corresponding period of 1940. Imports are almost entirely manufactured goods and foodstuffs, normally coming from the United States, Great Britain and Canada. Exports are fresh vegetables, especially tomatoes (almost entirely to Canada), timber, shell and strawwork and marine produce. Shell and strawwork exports in 1940 totalled £25,569, a 150% increase over 1939. Lumber, however, declined, as did the small sisal industry. A heavy crop of 130,000 lugs of tomatoes was exported to Canada in 1940, and a larger export was unofficially estimated for 1941. The sponge industry, formerly important, was suspended by government order until the end of 1943. The unbalance between imports and exports was offset by tourist expenditures and continued external (United States, Canadian and British) investment in real estate. The 1940-41 season was reported the best since 1937, "if not the best ever." The various export commodities, vegetable produce and fish, are the principal products.

Communication is by air, with five flights weekly from Miami, Fla., to Nassau, and by steamer. A new 700-ac. airport located three miles from Nassau was formally opened Jan. 8, 1941. (*See* also WEST INDIES, BRITISH.)

BIBLIOGRAPHY.—*West Indies Year Book, 1941-42; Canada-West Indies Magazine* (Montreal, monthly); *Crown Colonist* (London, monthly); *West India Committee Circular* (London, fortnightly). (L. W. BE.)

Bahrein Islands: *see* BRITISH EMPIRE.

Baker Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Baltic States: *see* ESTONIA; LATVIA; LITHUANIA.

Baltimore. Seventh largest city of the United States, Baltimore, Md., had a population of 859,100 by the federal census of 1940. Area, 78·58 sq.mi., plus 13·35 sq.mi. of water. The white population in 1940 was 692,533; non-white, 166,567. Mayor (Jan. 1, 1942), Howard W. Jackson.

Mayor Jackson had held office in 1941 for four terms, three of which had been served consecutively since 1931; comptroller, R. Walter Graham; president of city council, Richard C. O'Connell; all elected in 1939 for terms expiring in 1943. No elections were held during 1941. The new municipal airport, opened Nov. 16, 1941, compared favourably with modern U.S. airports with its new-type control towers and its airport and seaplane base facilities. Motor traffic control became an outstanding problem in 1941 with increased defense activity. New parking and driving regulations were promulgated after an extensive survey. Defense road construction called for an outlay of more than $13,500,000. During 1941 Edmondson avenue was extended to the city line by a dual highway, and a cutoff was being built from the Philadelphia road to the Glenn L. Martin aviation plant.

Because of a decrease in city expenses of $16,481 from tax levy funds, plus a decrease in the debt service and an increase of some $94,000,000 in the taxable basis, a reduction of 20 cents per $100 was possible in the tax rate for 1942.

Maryland firms, located mainly in the Baltimore industrial area, had received national defense contracts in excess of $1,000,000,000, or approximately one-tenth of all contracts, by the latter part of 1941. The Glenn L. Martin aeroplane plant and the Bethlehem Steel company expected an increase of 50,000 employees over the 1939 lists. Building and engineering contract awards in the area were $108,442,000 for the first 11 months of 1941. All important business indexes were above 1940 except vessel arrivals and the value of exports. (C. B. S.)

Bananas. Lack of shipping, hurricanes and plant disease contributed severe handicaps to the banana trade in 1941. In the British West Indies the British government made arrangements to pay a subsidy on 12,000,000 stems produced in the year ending Nov. 1, 1941 (the government had stopped shipments of bananas to the United Kingdom in Nov. 1940). The guarantee was later extended to cover 14,500,000 stems, the crop produced in 1941. Because of shipping restrictions, the British West Indies exported only 4,287,742 stems in 1941 and only 4,358,425 in 1940. The hurricane of Sept. 28, 1941, blew down 400,000 banana trees in the Atlantic zone of Guatemala. Shipments from the Atlantic coast of Guatemala in the first nine months of 1941 were 801,602 stems, compared to 1,022,021 stems during the same period in 1940. Total shipments during that time, from both Pacific and Atlantic areas of Guatemala, were 5,404,467 stems in 1941 and 6,850,677 stems in 1940, all to the United States. Honduras shipments in the first nine months of 1941 were 10,176,503 stems, compared to 11,312,199 stems in the first three quarters of 1940. Full-year shipments in 1940 were 14,535,551. Losses from hurricanes in the Tela area reduced the harvest drastically, but new plantations in La Ceiba district reported a 30% increase and largely made up the Honduras loss. Commercial banana growing in the Dominican Republic, the U.S. commerce department reported, was threatened with extinction by the sigatoka disease. Dominican banana exports to the United States reached a high of 825,000 stems in 1939. But later they declined steadily as the plant disease spread, and in the first six months of 1941 were only 5,827,425 kilograms. Exports of bananas from Cuba to the United States were 886,155 lb. in the first ten months of 1941 and 176,232 lb. in the corresponding period of 1940. Exports from Ecuador for the first nine months of 1941 were 966,110 stems. Of this number 463,157 stems were shipped to the United States and 485,240 stems to Chile. (S. O. R.)

Bankers Association, American: *see* AMERICAN BANKERS ASSOCIATION.

Bank for International Settlements. The balance sheet total of the bank which at the end of Dec. 1940 totalled 495,700,000 Swiss francs, after that remained relatively stable, amounting to 495,800,000 Swiss gold francs on March 31, 1941, and receding slightly to 471,500,000 on Oct. 31 of the same year. The volume of the bank's operations was appreciably reduced, for the turn in the political situation in June 1940 inevitably had a depressing effect on the bank's activities. Although its operations in the United States market were made subject to the system of licences in force, in practice these formalities did not prevent business, the bank being granted, as occasion arose, either a general or a special licence.

The net profit for the year ending March 31, 1941, was 5,294,000 Swiss gold francs, which compares with 7,962,000 Swiss gold francs for the preceding year.

In order to maintain the dividend in respect of the 11th fiscal year at the rate of 6% per annum, hitherto paid, it was decided to complete the sum of 7,500,000 Swiss gold francs necessary for this purpose by drawing upon the dividend reserve fund.

In the 11th annual report of the bank covering the business year ended March 31, 1941, it is said that "the Bank for International Settlements has been granted all reasonable opportunities for the conduct of its business, which has thus continued notwithstanding the difficulties of the international situation. The bank has adhered to the principles of scrupulous neutrality which it laid down for itself in the autumn of 1939, confining its activities strictly to transactions whereby no question can possibly arise of conferring economic or financial advantages on any belligerent nation to the detriment of any other. Moreover, no operations are carried out which might directly or indirectly run counter to the monetary policy of the central bank of the country concerned or in practice constitute a circumvention of the legal provisions governing the disposal of the currency of that country. When the bank has been faced with opposing claims to the same assets, it has been careful to examine the legal questions involved . . . and in case of doubt it has adopted a course designed to protect the various interests involved" (F. A. C.)

Banking. The national defense program and consequent expansion of general business stimulated the banking system in the U.S. during 1941. Banks increased their commercial loans and expanded their holdings of U.S. government obligations to aid in financing the defense effort. Many of the nearly 15,000 commercial and savings banks in the U.S. assisted the government in establishing contact with the smaller business firms throughout the country to facilitate the making of defense contracts. Leading city banks first felt the expansion, but as subletting of the larger contracts occurred there was a tendency to increase the proportion of loans and deposits in country banks. Bank deposits reached a new all-time peak of $68,453,000,000, due mainly to increased loans and investments and to added gold holdings which reached a new high of $22,800,000,000.

During 1941 the great influx of gold, which began with the Munich crisis in 1938, dwindled to substantially the level of new gold production. The 6,596 member banks of the federal reserve system, doing the bulk of the commercial banking of the U.S., had deposits of $49,160,000,000 on Sept. 24, an increase of more than $7,000,000,000 over 1940. Reserves of member banks declined during the year principally due to an increase of $3,000,000,000 in outstanding currency to a new peak of $11,224,000,000. Excess reserves were also reduced on Nov. 1 by an increase in reserve requirements of about $1,200,000,000 ordered by the board of governors of the federal reserve system. Excess reserves were thus reduced to about $3,500,000,000 from the peak in 1940

of about $7,000,000,000, absorbing the growth since 1940 but leaving such reserves higher than at any time prior to 1939. The turnover of bank deposits increased, but not proportionately to the growth in deposits, reflecting the continued idleness of funds awaiting investment or other profitable use. Gross earnings were somewhat higher but largely offset by increased expenses. Income from loans and investments was higher due to greater volume, but average rates were somewhat lower. Total service charges collected on deposit accounts continued to increase, and these, together with trust department earnings, again constituted a substantial part of current earnings. Notwithstanding increased earnings, the total dividends declared were less than for 1940.

A factor which might affect future earnings was the passage by congress of legislation making all government obligations issued after Feb. 1, 1941, fully taxable, and imposing a surtax applicable to outstanding bonds. Further orders were issued by the president during 1941, affecting foreign funds in the U.S., culminating in the blocking of balances of all European nationals and the requirement that comprehensive reports, designated TFR-300, be filed for each. Instalment loans were placed under control of the federal reserve board, and certain restrictions were ordered to divert more productive capacity to defense needs. The Federal Deposit Insurance corporation insured deposits in 13,442 commercial banks with total assets of over $70,000,000,000, highest figure ever reported. Losses which had to be absorbed were nominal in amount and eliminated most of the weaker banks. The Export-Import bank took a very active role in developing Latin-American trade. The outbreak of war with Japan on Dec. 7, and later with the other axis powers, served to accelerate the efforts of banking and all other business elements in the U.S. toward war preparations. (*See* also BUSINESS REVIEW: *Securities and Banking;* FEDERAL DEPOSIT INSURANCE CORPORATION; FEDERAL RESERVE SYSTEM; LAW; STOCKS AND BONDS.)

Canada.—Banking as well as all business conditions were profoundly affected by the war. Industrial production expanded rapidly, necessitating increased banking facilities and involving war financing on a large scale. Commercial loans of the ten chartered banks increased from $1,102,000,000 to $1,255,000,000, in spite of direct government financing of many of the new plants producing war supplies. Total investments, largely in government securities, increased from $1,563,000,000 to $1,700,000,000. Earnings did not keep pace with volume and activity, due to somewhat lower rates and, more directly, to increased taxes. In an effort to divert a larger portion of the national income to the war effort, the government placed drastic restrictions on loans to finance instalment purchases. On Nov. 1 a federal program of control over prices, wages, rents and farm incomes was instituted which might have a far-reaching effect on banking and business in the dominion. The Bank of Canada increased its holdings of Canadian government securities from $580,000,000 to $700,000,000. Note circulation was increased from $331,000,000 to $435,000,000.

Great Britain.—The burden on British banking due to the war effort was considerably lessened by increased government financing of war production and by the operation of the lend-lease act passed by the United States congress on March 11, 1941. The volume of bank loans tended to decrease after reaching a new high level in the first few months of the war, the comparative figures being £1,015,000,000 sterling in Dec. 1939, and £839,000,000 sterling in Sept. 1941. On the other hand, security holdings, chiefly government bonds, rose sharply and total deposits reached a new high level of £3,115,000,000 sterling. This was accompanied by an increase in the price level, but the operation of the extensive economic control measures adopted by the British government tended to reduce the acceleration of price increases occasioned by war conditions. (*See* also BANK OF ENGLAND.)

Europe.—Banking throughout Europe was dominated by Germany either through conquest or by control of the economic life of the few countries remaining in a neutral or nonbelligerent status. German banks followed its armies, and financial infiltration was accomplished by control of banks in occupied territories through acquisition of controlling stock interest and other means. Currencies of all occupied countries were based on the reichsmark. Furthermore, reichsmark notes of a type not allowed to be used in Germany were issued to German troops in the various occupied countries and given the quality of legal tender for all payments. Note circulation of the Reichsbank again showed a substantial rise from 12,000,000,000 to more than 17,000,000,000 reichsmarks. German savings deposits increased rapidly to more than 30,000,000,000 reichsmarks, due mainly to lack of goods available to satisfy the enlarged purchasing power. The government provided for the sterilization of such deposits by making them tax exempt if held for a year after the termination of the war. The Bank of France, through a series of conventions with the treasury, advanced 130,000,000,000 francs to meet the costs of the German army of occupation. Note circulation rose from 175,000,000,000 francs to 242,000,000,000 francs. The operations of commercial banks throughout Europe were not made available after the German invasion. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES; SAVINGS BANKS, MUTUAL.)

Investment Banking.—The volume of investment securities other than U.S. treasuries distributed during 1941 was well above the average for the years 1937–41, the figure for ten months ending Oct. 31 being $5,045,469,000. This compares with only $3,750,446,000 in the similar period of 1940. Corporate issues represented $2,324,118,000, the balance being chiefly municipal, farm loan and government agency issues. By a change in government policy, the latter classification would gradually disappear as issues mature, all future financing of government agencies being provided through United States treasury bond and note issues. As in several years before, refundings predominated among new corporate issues due to the attractively low interest rates prevailing, more than 60% being in this classification. However, this compared with 75% in 1940, indicating a definite increase in the volume of new capital raised. Municipal issues were offered in smaller volume than the previous year, due in part to reduction of the relief load caused by improved employment conditions and to the reduction in public works to give increasing emphasis to defense production financed by private and federal funds. The United States treasury issued $15,691,528,000 in bills, notes and bonds in the ten months ending Oct. 31, about half to refund maturing issues, the balance to finance the growing defense industry. No less than $3,451,125,000 were issued in October, the highest volume for any month, and with the entry of the U.S. into the war, even this record seemed soon to be broken.

The Investment Bankers association expressed anxiety at the vast new expenditures of the government for plant expansion in the defense industries, while private industrial financing remained at relatively low levels. Much influence was exercised by the Reconstruction Finance corporation (*q.v.*), which on more than one occasion threatened to overbid private bankers on public utility and railroad equipment issues. The large refunding issue of the state of Arkansas was actually bought by that federal agency in the face of lower bids by private bankers. The Federal Securities and Exchange commission promulgated regulations during 1941, requiring public utility companies in holding company groups to offer new issues to competitive bidding instead of dealing directly with the company's traditional investment banking connection. Considerable dissatisfaction resulted among bankers, and the commission itself recognized this system as not suited to all cases

but entitled to a fair trial. Government, municipal and high-grade corporate bond prices reached record high levels in October, but late November saw a rise in short-term yields followed by lower prices for all bonds with the outbreak of war with Japan in December. (E. B. L.)

Bank of England. The main change in the bank return in 1941 was the steady growth in the note circulation, amounting to £70,000,000 during the first ten months. The figures in the closing months of the year compared with a prewar circulation of about £500,000,000. The chief cause of the rise was the growing war industrial activity, reflected in a record volume of employment and consequent growth in pay rolls. A much larger proportion of the national income was going to people without bank accounts who therefore used currency instead of cheques. This growth in the note circulation necessitated two increases in the fiduciary issue during the year, on April 30 and Aug. 30, effected by a transfer of securities from the banking to the issue department. There was no change, as a result of this, in the outside liabilities of the bank.

The bank continued its duties of administering the national debt, including the new loans issued during 1941. These were the 2½% national war bonds 1946–48; 3% savings bonds 1955–65; and 2½% national war bonds 1949–51. The first issue closed in the summer after raising £494,000,000 since the opening of the year. The last issue opened in the early autumn. The bank also carried through on the government's behalf the vesting of certain securities. These included Indian, Canadian and South African sterling stocks; also a number of securities and other assets required as collateral to the U.S. secured loan to the U.K. were borrowed from holders by the government. The object of the Indian vesting was to provide for the liquidation of part of India's large wartime accumulation of short-term funds in London by repayment of long-term Indian sterling debt. The Canadian vesting was designed to augment British resources in Canadian dollars, and the South African vesting had the effect of increasing the amount of gold, and so potentially of dollars, at the disposal of the U.K. The bank continued to administer the exchange control regulations, which were further developed during 1941.

The work of the bank in regulating the general credit position was increased by the wartime expansion in the ebb and flow of funds out of and into the exchequer. Briefly, if money became too plentiful the banks were invited to increase their loans to the government against treasury deposit receipts. If money became tight, borrowing in this form was reduced and special purchases of bills were made in the market. The chief cause of temporary stringency was sudden and heavy subscriptions to war loans; *e.g.*, London's "war weapons week," and the launching of the "warships week" campaign in October. The closure of the issue of 1946–48 war bonds was also preceded by heavy subscriptions. The spring growth in discounts and advances was due to technical operations arising out of the Indian vesting.

In September Montagu Norman, although in his 70th year, agreed to stand for re-election as governor for a further year, and J. M. Keynes was elected to the vacancy in the bank's directorate caused by the death, from enemy action, of Lord Stamp (*q.v.*). (N. E. C.)

Bank of England
(£ million)

	1940 Dec. 25	1941 Apr. 23	1941 Apr. 30	1941 Aug. 27	1941 Sept. 3	1941 Oct. 15
Issue dept.						
Note circulation	616.9	622.5	623.3	664.7	667.3	686.1
Fiduciary issue	630.0	630.0	680.0	680.0	730.0	730.0
Banking dept.						
Reserve	14.2	9.1	58.3	17.3	64.6	45.6
Public deposits	12.5	16.1	13.6	14.9	14.5	11.1
Bankers' deposits	135.7	112.5	131.8	125.7	122.7	128.2
Other deposits	51.2	52.2	57.2	49.1	53.0	54.4
Govt. securities	178.5	132.2	109.3	160.3	115.9	141.9
Discounts & advances	4.0	38.2	28.3	6.4	7.1	2.8
Other securities	20.5	19.1	24.4	23.6	20.6	21.0

Bankruptcy: *see* BUSINESS REVIEW: *Bankruptcy;* LAW; SECURITIES AND EXCHANGE COMMISSION: *Bankruptcy Reorganizations.*

Banks: *see* BANKING; SAVINGS BANKS, MUTUAL.

Banting, Sir Frederick Grant (1891–1941), Canadian scientist and co-discoverer of insulin, was born Nov. 14 at Alliston, Ontario. He was head of the Banting institute, and a member of the National Research Council of Canada after 1937. Dr. Banting joined a base hospital unit as medical liaison officer between Canadian and British armies at the outset of war in 1939, and was promoted to the rank of major. He made frequent trips to England to exchange vital medical information, and as director and correlator of medical research kept in constant touch with his staff of researchers at the University of Toronto. After the start of the war, the Banting institute was turned over to the study of aviation medicine, and, as its chairman, Dr. Banting flew extensively under all conditions to discover means to neutralize the strains caused by high altitude flying and dive-bombing. He also studied conditions associated with tank warfare. While chairman of the associate committee on medical research of the National Research council, his committee developed new methods for preserving blood so that large banks could be held in reserve. Dr. Banting, who was on his way to England from Canada, was killed in the crash of a military plane in the snowdrifts of Newfoundland, Feb. 21. (See his biography in *Encyclopædia Britannica.*)

Baptist Church. The Baptists of the United States reported in 1941 a total membership of 11,269,558 —the Northern convention 1,561,289; the Southern, 5,104,327; two National conventions (Negro), 4,073,252; others, 530,690— an increase of 167,430 above that of 1940.

War engaged the attention of the Northern and Southern groups. In defense of conscientious objectors the former affirmed "the sacred obligation of every Christian to obey his conscience." Renouncing "war as a means of settling international difficulties" and "disapproving totalitarianism," sympathy was expressed "with democratic peoples in their struggle against tyranny," and appreciation of the president's "repeated efforts to keep our nation from armed participation in foreign wars, while giving great aid to the Democracies."

The Southern convention asserting its "abhorrence of war and all its insanity and brutality," nevertheless declared its "belief that some things are worth dying for; worth living for; and (therefore) worth defending even unto death." Later it was careful to record that this resolution "in no way commits the Southern Baptist convention to an approval of war, as a recognized principle in settling international differences." Plans were laid by this convention for the observance of its centennial in 1945 at Augusta, Ga., where the convention was organized in 1845.

The Northern body gave serious thought to the problem of higher education. Many of the colleges were faced with financial difficulties that endangered their future security. All denominational leaders, pastors and laymen, were called upon to endeavour through church, association and convention programs to impress upon the people the need of support for these institutions and also the need of "college men and women carefully, intelligently and spiritually trained to give effective leadership." An emergency fund of $100,000 for this cause was sought on Dec. 7, the Sunday of Sacrifice. (R. E. E. H.)

Bar Association, American: *see* AMERICAN BAR ASSOCIATION.
Barbados: *see* WEST INDIES, BRITISH.

Barclay, Sir Thomas (1853–1941), British lawyer, was born in Dunfermline, Scotland. He was an honorary member of the Institute of International Law and a vice-president of the International Law association. He was also a member of the Royal Academy of Jurisprudence of Spain and member of the Académie Diplomatique Internationale. An ardent advocate of Anglo-French amity, Sir Thomas was identified in the United States and in Europe with international arbitration and peace movements. Among his publications were: *Law and Usage of War* (1941), *Collapse and Reconstruction* (1919) and *Wisdom of Lang-Sin* (1927). He died in occupied France and a funeral service was held for him in Versailles, Jan. 20. (See *Encyclopædia Britannica.*)

Barium Minerals. About 1,000,000 tons of barium minerals, chiefly the sulphate, with some carbonate, are mined annually, about one-half in Germany and one-third in the United States. In 1940 the United States production was 390,462 short tons, and sales 409,353 tons, indicating a considerable withdrawal from stocks; imports had dropped to 7,391 tons, as against 73,080 tons in 1931. (G. A. Ro.)

Barley. The United States crop in 1941 was estimated Nov. 1 by the department of agriculture as 351,522,000 bu., the largest production of barley on record in the United States. The 1940 crop was 309,235,000 bu.; the ten-year (1930–39) average production, 224,970,000 bu. The acreage in 1941 was 13,977,000 compared to 13,394,000 ac. planted to barley in 1940 and a ten-year average of 10,707,000 ac. Owing to an unusually favourable season, all the important barley states except California reported yields well above the average. The yield in 1941 was 25·2 bu. per ac. In 1940 it was 23·1 bu. per ac.; the ten-year average, 20·6 bu. per ac.

In Canada the program of reducing wheat production and increasing other crops resulted in a larger area sown to barley—4,882,000 ac. in 1941 compared to 3,622,000 ac. in 1940 and a five-year (1935–39) average of 3,553,000 ac. The Canadian crop for 1941, preliminary estimate, was placed at 103,800,000 bu. The 1940 production was 104,256,000 bu., and the five-year average 88,882,000 bu. (*See* also CEREALS.)

U.S. Production of Barley in Leading States, 1941 and 1940

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Nebraska	40,054,000	22,544,000	Oklahoma	7,218,000	5,780,000
Minnesota	44,980,000	57,348,000	Idaho	7,098,000	5,950,000
North Dakota	41,050,000	28,064,000	Oregon	6,048,000	5,000,000
South Dakota	30,226,000	30,821,000	Michigan	5,890,000	5,796,000
Kansas	27,260,000	18,176,000	Montana	5,824,000	4,692,000
California	25,272,000	33,516,000	Illinois	5,610,000	4,928,000
Wisconsin	17,236,000	24,525,000	Washington	4,040,000	3,915,000
Colorado	14,625,000	9,368,000	Utah	3,696,000	2,812,000
Iowa	8,478,000	14,553,000	Missouri	3,280,000	4,004,000
Texas	7,884,000	3,825,000	Pennsylvania	3,222,000	4,030,000

(S. O. R.)

Bartet (Regnault), Jeanne Julia (1854–1941), French actress, was born Oct. 28 in Paris. Mme. Bartet, who was one of the leading actresses of the Comédie Française for 40 years, made her last appearance in *La Hérodienne* in 1919. She had played leading roles in the dramas of Racine, Molière, Marivaux, De Musset, Victor Hugo and Dumas. A report of her death in Paris reached Vichy Nov. 20, 1941. (See *Encyclopædia Britannica.*)

Basalt: *see* STONE.

Baseball. Attendance at professional baseball games throughout the U.S. in 1941 showed an increase over the previous year's total. Judge William G. Bramham, president of the National Association of Professional Baseball Leagues, enrolling 41 leagues of six and eight cities or towns each, from coast to coast, with loops into Canada, reported an increase of more than 3,000,000 paid attendance above the 1940 figure, approximating the 18,500,000 of 1939, baseball's centennial year, the all-time high for the minor leagues.

The major leagues, according to Associated Press tabulations during the season, showed a total of 5,220,519 for the American league and 5,029,689 for the National league. Collectively, the major league total fell 31,883 short of 1940 figures, representing chiefly the fact that the American league race, a runaway for the New York Yankees, failed to have the engrossing interest in its closing weeks which 1940's neck-and-neck finish between Detroit and Cleveland generated.

The National league's 1941 race, on the contrary, was a ding-dong affair between Brooklyn and St. Louis, the senior circuit's attendance gaining over 1940. The National league gain, however (181,389), was not as great as the fall-off (213,272) in American league figures.

World Series.—The opening game of the world series between the New York Yankees and the Brooklyn Dodgers on Oct. 1 set an all-time high for attendance at a world series game, 68,540 ("all-time" in this case covering postseason play between major league championship teams dating from 1884 and annually without omission since 1905). The previous high was 66,669, set Sept. 30, 1936, at the same field (Yankee stadium, New York) in the opening game between the two New York teams, Yankees and Giants.

The 1941 world championship was won by the Yankees, four games to one, setting new records for New York's American league representative club. It was the eighth straight world series victory for the club in eight appearances since defeat at the hands of the St. Louis Cardinals in 1926. Until beaten by Brooklyn in the second game of the 1941 world series, the Yankees had a string of ten straight games won in world series play, also an all-time record.

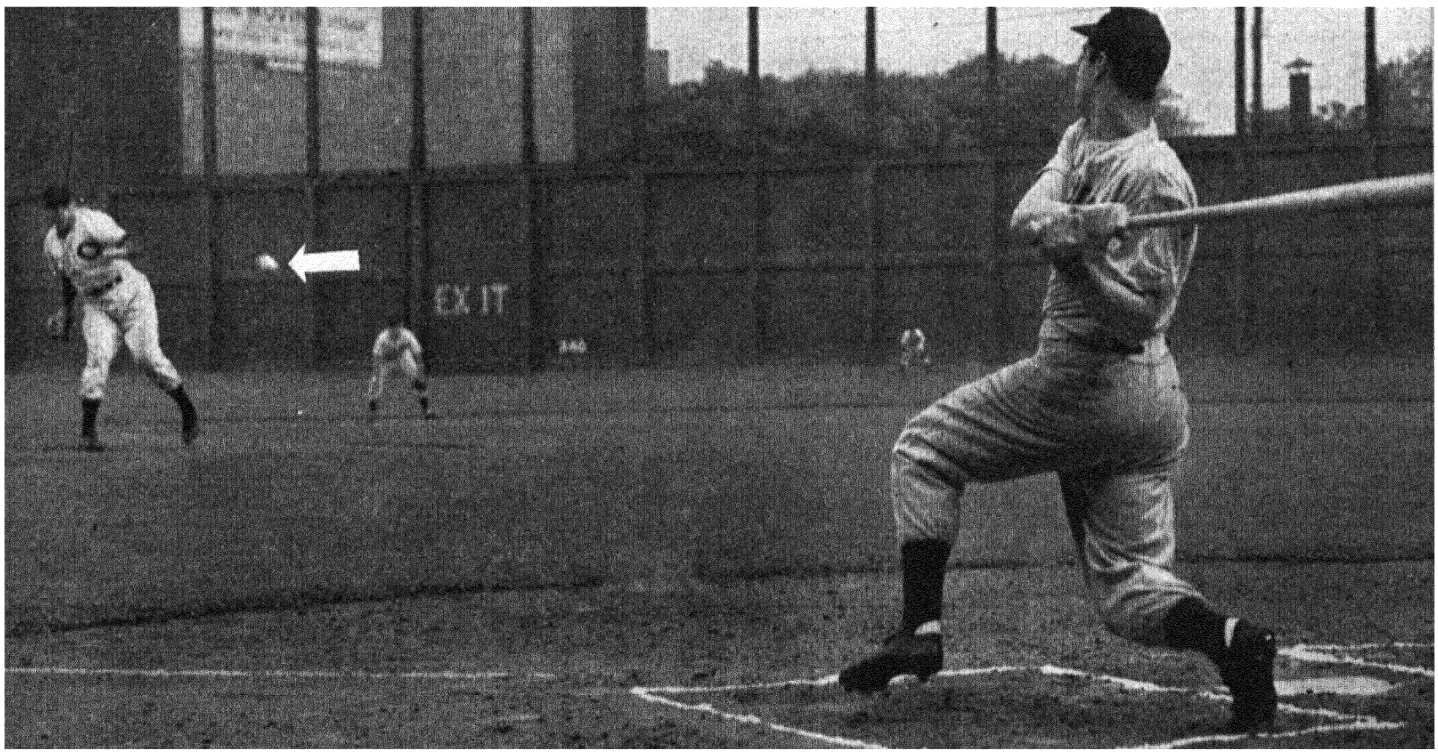
All five games of the world series were close and hard fought, the first two on the Yankee grounds in the Bronx, the rest at Ebbets field, Brooklyn. The Yankees won the first game, 3 to 2, taking the lead on a homer by second-baseman Joe Gordon, the all-around individual star of the series, in the second inning, and keeping ahead all the way.

Brooklyn's 3–2 victory in the second game featured great pitching by the Dodger ace, Whitlow Wyatt, who shut out the "Bronx Bombers" the last six innings. Facing a 2–0 disadvantage after three innings of play, the "Brooklyn Bums" tied the score in the fifth and put over the winning run in the sixth on a single by Dolph Camilli, National league's leading run-driver and named by the official jury of baseball writers as the National league's most valuable player of 1941.

The 2–1 Yankee victory in the third game high-lighted New York's youthful left-handed pitcher, Marius Russo, who allowed the Dodgers only four hits. New York scored its pair of runs in the eighth inning, the first driven across by Joe DiMaggio, Yankee centre fielder and American league's most valuable player of 1941.

In this game the first serious adverse "break" afflicted the losing side when a savage drive from the bat of young Russo struck his pitching opponent, Fred Fitzsimmons, on the left leg in the seventh inning and put him out of action for the duration. Up to this moment, the rival aces were locked in a scoreless duel which bade fair to stretch on and on.

The fourth game, however, staged the most dramatic episode of



JOE DIMAGGIO of the New York Yankees established a major-league baseball record by hitting safely in 56 consecutive games in 1941. Here he is shown hitting past Al Milnar, Cleveland pitcher, in the 56th game July 16. Arrow indicates the ball

the series, the play which was not only the turning point of the game but probably decided the series as a whole. The Dodgers, thanks to a home run over the wall in right centre by their centre-fielder, the National league batting champion, Pete Reiser, went ahead with two runs in the fifth inning and held a 4–3 lead with two out in New York's half of the ninth.

Needing one put-out to end the game with Brooklyn victorious and the series in a deadlock, two games to two, the home team apparently achieved the objective when the Yankee batter, Tom Henrich, swung and missed for a third strike.

The pitch by the Dodger pitcher, Hugh Casey, was a low and sharp-breaking curve. The Brooklyn catcher, Mickey Owen, only partly blocked the ball instead of catching it. Entitled to a chance for first base as soon as the ball touched the ground, Henrich set out for the base and attained it before Owen could retrieve the ball and throw it there. Thus reprieved, the Yankees swung into action with their bats, scoring four runs before being retired. The vital hits came from the bats of husky Charlie (Killer) Keller and DiMaggio.

The last game, though the score was close, 3 to 1, offered no thrill comparable to those of its predecessors. The Yankees scored two runs in the second inning. Their pitcher, Ernie Bonham, held the advantage throughout over Wyatt, Dodger mound hero of the year and of the series.

All-Star Game.—The entire proceeds of the annual All-Star game between picked teams representing the two major leagues were donated to the United Service organizations, in amount $53,226.27. The game was played in Briggs stadium, Detroit, July 8. Attendance, 54,674, about 15,000 less than the record for All-Star game attendance, set in Cleveland Municipal stadium (69,812) in 1935. The American league victory in Detroit by a 7–5 score was the sixth for the American league in a series of nine games played annually, starting in 1933.

With the National league team leading, 5 to 3, with one out and the bases filled, a grounder to shortstop by DiMaggio set up a double play in prospect which would end the game. The out was executed at second base, but the throw to first base was wild and DiMaggio was safe, the score becoming 5–4 on the run that crossed the plate on the play. The next batter, Ted Williams, of the Boston Red Sox, American league 1941 batting champion, then brought the contest to a dramatic conclusion by driving a home run over the roof of the right-field grandstand, scoring 3 runs.

Pennant Races.—The Yankees made history in winning their American league pennant as well as in their world series triumph. They clinched their title Sept. 4, the earliest date on record in either major league for the 154-game schedule in operation since 1901. It was their fifth pennant in six calendar years, also an all-time major league record.

By contrast, the Dodgers won their pennant in the most sustained two-team race in the history of major league baseball. From opening day to the finish Brooklyn and the St. Louis Cardinals kept so close in the percentage table that there was never a time, all season long, when either side could take a deep breath with the feeling that its lead was anywhere close to "commanding."

Starting April 27, the Dodgers and Cardinals kept first and second places as their own throughout the season. May 3 they were the only two National league clubs above the .500 mark. Most of the first six weeks of the season the Giants were the only other club which won more than half of its games. On July 15, when the Dodgers beat the Cubs a double-header, they enjoyed a four-game lead over the Cardinals, the largest margin held by either club over the other at any time in the course of the year. For the space of about an hour that afternoon the Dodger lead was actually 4½ games. Their double-header was finished before a decision was reached in the St. Louis-Philadelphia game in Philadelphia, a 16-inning affair won by the Cardinals.

This lead quickly dwindled, for on July 16 the Red Birds invaded Flatbush and promptly defeated the Dodgers in a night game, going on to make a clean sweep of the two-game series two days later. In 15 days the scene had shifted so that St. Louis held a three-game margin. On four occasions in late May and June the Cardinals also attained a three-game lead over the Dodgers, their tops for the year. In early June, first place changed hands six times in nine days.

For the first time since 1928 the Brooklyn pitching staff had an ace who passed the 20-game mark in victories. Both Whitlow Wyatt and Kirby Higbe won 22. The 1941 Dodgers led the league in homers for the first time since 1908. Camilli was the first Dodger to win the National league home run championship since Jacques Fournier in 1924. Reiser was Brooklyn's first batting champion since Lefty O'Doul in 1932, and the fifth man ever to win the batting title for Brooklyn in the 51 years of its National league history, sharing the honour roll with Dan Brouthers (1892), Jake Daubert (1913 and 1914), Zack Wheat (1918) and O'Doul.

Individual Achievements.—Camilli, elected the National league's most valuable player by the Baseball Writers' Association of America, led the league both in home runs and in runs batted in. His teammate, Reiser, second in the voting, was the first player ever to win a batting championship in his first complete season of major league play. Wyatt, Dodger ace, ranked third.

The voting in the American league was closer. DiMaggio's outstanding batting performance was rivalled by that of Williams, the batting champion, whose average of .406 was the first above .400 in the major leagues since Bill Terry of the Giants in 1930, and the highest in the American league since George Sisler's .420 in 1922.

DiMaggio, though his batting average for the season was nearly 50 points below that of Williams, established a new record for hitting in consecutive games, his mark of 56 surpassing the American league record of 41, set by Sisler in 1922, and the National league record of 44 straight, set by Willie Keeler in 1897.

The value of DiMaggio's streak is reflected in the fact that when it started, May 15, the Yankees were in fourth place, five and one-half games behind the league leader. When it ended, July 17, the Yankees were in first place by a seven-game margin.

Pitching honours for the year in the National league starred Elmer Riddle of the Cincinnati Reds as champion in both the won-lost percentage (19 and 4) and in earned-run average (2.24).

Vernon Gomez of the Yankees was the American league leader by percentage, 15 wins against 5 defeats, while the earned-runs award went to Thornton Lee, Chicago White Sox, with 2.37.

Minor Leagues.—All 41 minor leagues finished out their schedules to a championship decision. The Columbus, O., Red Birds, American association champions, won the junior world series over the Montreal Royals, International league play-off champions. Seattle was the pennant winner in the other class AA organization, the Pacific Coast league.

In the class A-1 bracket, the Nashville Vols, Southern league play-off champs, prevailed over the Texas league representatives, the Dallas Rebels, in the annual Dixie series.

Thirty-six of the 41 leagues used the Shaughnessy play-offs, a system of postseason competition in which the first division clubs play a round-robin elimination series to determine the final championship. In the three class AA leagues, Columbus won both the American association pennant and the play-off series, as did Seattle in the Pacific Coast league. In the International league, the Newark pennant winners were defeated in the play-offs by the second-place Montreal Royals.

Both pennant winners in the class A-1 circuits toppled in the play-offs. Houston, in the Texas league, went out in the first round, the fourth place Dallas Rebels becoming Shaughnessy champions. The Nashville Vols, second-placers in the Southern association pennant race, conquered the flag-winning Atlanta Crackers in the play-offs.

Besides Columbus and Seattle, ten other pennant winners withstood all challengers in the Shaughnessy finals: Mobile in the Southeastern league; Durham in the Piedmont league; Harrisburg, Pa., Interstate league; Joplin, Western association; Dothan, Alabama State league; Oneonta, N.Y., Canadian-American league; New Iberia, La., Evangeline league; Wilson, N.C., Coastal Plain league; Logan, W.Va., Mountain State league; and Elizabethton, Tenn., Appalachian league.

Second-place teams victorious in Shaughnessy rounds in addition to Montreal were: Columbia, S.C., which vanquished the pennant-winning Macon Peaches in the South Atlantic league; Cedar Rapids, victors over the Indiana-Illinois-Iowa league flag-winners, the Evansville Bees; Hot Springs, Ark., toppling the cotton states' first-place Monroe, La., team; Erie, Middle Atlantic champs over Akron's pennant club, Salem, topping the Virginia league after Petersburg won the pennant; Ogden, Utah, Pioneer league champs over Boise; Butler, Penn State association, over Johnstown; Salisbury, North Carolina State, over Kannapolis; Miami Beach, Florida East Coast, over West Palm Beach; and Bradford, Pennsylvania-Ontario-New York, over Jamestown.

Only two third-place teams beat their pennant winners, the Elmira Eastern leaguers, who conquered Wilkes-Barre, and Clovis, N.M., victors over Big Spring, Tex., in the West Texas-New Mexico league.

Besides Dallas, fourth in the Texas league pennant race, but first in postseason play, eight more fourth-place clubs won out over pennant winners: Eau Claire, Wis., Northern league, over Wausau, Wis.; Sanford, N.C., Bi-State league over Leaksville, N.C.; Easton, Md., Eastern Shore league, over Milford, Del.; Pueblo, Colo., Western league, over Norfolk, Neb.; Thomasville, Ga., Georgia-Florida league, over Albany, Ga.; Mayfield, Ky., Kentucky-Tennessee league, over Jackson, Tenn.; Leesburg, Florida State league, over St. Augustine; and Sheboygan, Wis., Wisconsin State league, over Green Bay.

The leagues without Shaughnessy play-offs posted the following champions: California league, Santa Barbara, Western International, Spokane; Arizona-Texas, Tucson; Michigan State, Flint; Northeast Arkansas, Newport; and Ohio State, Fremont.

Independents.—Following district, state and sectional play-offs, Enid, Okla., became national champion in the final round of the National Semi-Pro congress, enrolling about 8,000 independent teams throughout the United States.

The American Legion's Junior baseball tournament, in which the teams qualified by states, crowned San Diego, Calif., the 1941 champion in the finals. (W. E. Bt.)

Basketball. An estimated 90,000,000 spectators paid admissions during the 1941 season to witness the lightning speed of "name" teams, conference, sectional and city champions in the U.S. All attendance figures were shattered during the regularly scheduled double-header programs and invitation tournaments in Madison Square Garden, New York, when a total of 317,849 people saw the games.

The Long Island university Blackbirds conquered the Wisconsin Badgers, 56–42, in one of the glamour contests of the season. Wisconsin became the "superior" team by annexing the Big Ten Western Conference championship, and later by beating Washington State in the N.C.A.A. final in Kansas City. Washington State went on to win the North Pacific Coast conference. Dartmouth ran off with the Eastern Intercollegiate league honours for the fourth year in a row. Duke succeeded North Carolina in the Southern conference, and Arkansas beat Rice for the Southwestern conference. Kansas and Iowa tied for the Big Six crown.

The National Y.M.C.A. championship was won by the Division street team of Chicago. The Eastern Athletic club title went to the Columbus Council K. of C. quintet. The National A.C.U. crown was taken by the Hollywood 20th Century quintet, beating the Olympic club, of San Francisco, Calif., after nosing out the defending champion, Phillips 66 Oilers of Oklahoma. The Ohrbach A.A. team won the Metropolitan (N.Y.) A.A.U. title for the third consecutive year.

Sports writers agreed that Frank Baumholtz, of Ohio university, be named basketball's outstanding player for 1941. Ossie Schectman of Long Island university was second choice. In the competitions in and around New York, the Seton hall (N.J.) five scored 42 consecutive victories, with the great Bob Davies in the line-up, yet Seton hall bowed to Long Island university by the big score of 49–26. Voted to the All-American basketball team were Angelo Luisetti, Frank Lubin, Carl Knowles and Ralph Grannini, of the Olympic club, and Chet Carlisle, of Oakland, Calif. (J. B. P.)

Basutoland: *see* British South African Protectorates.

Bauxite. World production of bauxite during recent years is reported in the accompanying table, the figures for 1940 being largely estimates. British and Canadian demand centres on British Guiana, that of the United States on Surinam (Dutch Guiana), while the axis powers control the outputs of Greece, Hungary, Italy, Yugoslavia and probably France.

World Production of Bauxite
(Metric tons)

	1929	1937	1938	1939	1940
Br. Guiana	220,119	366,700	382,400	483,700	550,000
France	666,348	688,200	682,400	680,000	700,000
Greece	..	137,400	179,900	186,900	180,000
Hungary	389,152	532,700	540,700	570,200	560,000
Italy	192,774	386,500	360,800	483,965	380,000
Neth. E. Indies	..	199,000	245,400	230,700	274,375
Surinam	219,603	392,400	377,200	511,600	615,434
U.S.S.R.	..	230,000?	250,000?	250,000?	270,000
United States	371,648	431,400	315,900	381,300	445,958
Yugoslavia	103,366	354,233	396,400	318,800	260,000
World Total	2,185 000	3,750,000	3,850,000	4,370,000	4,500,000

United States production was considerably increased in 1940, and further increase was to be expected in 1941, but domestic sources cannot meet the demand, and in both 1939 and 1940 about 56% of the consumption was imported, mostly from Surinam. Imports in 1940 totalled 629,552 long tons, 90% of which was from Surinam, as compared with a production of 439,413 tons. Because of the importance of the Surinam deposits in maintaining adequate supplies of bauxite in the United States, that country sent troops to the mines late in Nov. 1941, to protect them. (G. A. Ro.)

Beans, Dry. A traditional army food, beans achieved their largest production on record in 1941 in the United States—18,226,000 bags by estimate of the department of agriculture Oct. 10. The previous highest yield was 16,074,000 bags in 1940. The ten-year (1930–39) average crop was 13,297,000 bags (100 lb. bags, uncleaned). The 1941 planting was 2,100,000 ac.; the carry-over, 3,300,000 bags.

U.S. Production of Dry Beans in Leading States, 1941 and 1940
(In 100 lb. bags)

State	1941	1940	State	1941	1940
Michigan	6,163,000	4,309,000	New York	1,256,000	903,000
California	5,332,000	5,492,000	New Mexico	791,000	656,000
Idaho	1,014,000	1,667,000	Wyoming	649,000	605,000
Colorado	1,460,000	1,760,000	Montana	250,000	270,000

(S.O.R.)

Beard, Daniel Carter (1850–1941), U.S. artist and author, and one of the founders of the Boy Scout movement in the United States, was born June 21 in Cincinnati, Ohio. His father was a portrait painter and young Beard, who inherited his ability, studied at the Art Students' League in New York from 1880 to 1884. He established his reputation with his illustrations for Mark Twain's *A Connecticut Yankee at King Arthur's Court,* published in 1889, and for *Tom Sawyer Abroad.* But Beard's major interest was the youth movement. In 1878 he found that the sprawling U.S. cities had no playgrounds and parks for the development of healthy children. He then launched a drive to take children out of the slums into the open countryside, and the fruit of this campaign was the creation in 1908 of the Boy Scouts of America, a movement in which he was one of the leaders. By 1940 there were nearly 1,500,000 boy scouts in the United States and "Uncle Dan," as Beard was affectionately known, was national scout commissioner. In 1940, 50,000 boy scouts gathered in the court of peace in the New York world's fair to pay homage to Beard on his 90th birthday. He was the author of a number of books for boys and wrote and illustrated a monthly article for *Boys' Life,* official publication of the Boy Scouts. He died at Suffern, N.Y., June 11.

Beaverbrook, William Maxwell Aitken, 1ST BARON (1879–), British publisher and statesman, was born May 25, the third son of a Scotch Presbyterian minister stationed at Newcastle, N.B., Canada. Educated in the public schools of Newcastle while he peddled newspapers, he entered business and formed a successful merger that earned him a fortune. He went to London, entered politics and was elected member of parliament in 1910. He was with the Canadian expeditionary force in France in 1915 and later was officer in charge of Canadian war records. In 1918 he was appointed chancellor of the duchy of Lancaster and minister of information. Meanwhile, in 1917, he had purchased control of the London *Daily Express,* a failing newspaper which by the 1930s he had converted into the largest daily in the world, with a circulation in excess of 2,500,000. Lord Beaverbrook, as he was known after 1917, also became publisher of the *Sunday Express* and the *Evening Standard.* On May 14, 1940, he was named by Winston Churchill minister of aircraft production, and on Aug. 2 he was admitted to the war cabinet.

On May 1, 1941, Churchill removed him from the ministry of aircraft and appointed him minister of state. The duties of this newly created office were not itemized at the time, but it later turned out that Beaverbrook was the prime minister's chief "trouble-shooter" in matters of production, supply, procurement, U.S. lend-lease aid, etc. In a further effort to speed up the production of British arms, Churchill appointed him minister of supply June 29. Beaverbrook was present at the "Atlantic charter" meeting between Roosevelt and Churchill in August and proceeded to Washington to confer with U.S. government officials on lend-lease problems. He represented Britain at the three-power (U.S.-British-Russian) conference which opened in Moscow Sept. 29. In December, Beaverbrook again accompanied Churchill to the United States, and he remained in Washington to discuss allied problems of supply. (*See* also *Encyclopædia Britannica.*)

Bechuanaland Protectorate: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

Bee-keeping. Honey, with the exception of wheat, was apparently the only generally used food crop not included in the United States' 1941 defense program urging large increase in the production of foods in 1942. Although a sugar shortage, with quota rationing, was impending, honey apparently was overlooked. Prices for honey advanced in 1941 only about 15%, a general average estimated by the *American Bee Journal,* Hamilton, Ill. This advance was estimated at 10% in eastern and middle west states and as high as 25% in prairie and mountain states. Expectancy was expressed in the trade that the price to carlot producers might rise to 6 or 7 cents per pound. The normal production of honey in the United States is about 160,000,000 lb. Much of the production, instead of coming from individual farms, is from large apiaries favourably situated as to bee pasture. Shipments of bees from the United States to Canada in April, May and June of 1941 were reported by the *American Bee Journal* as valued at $199,580. (S. O. R.)

Belgian Colonial Empire. The table below gives material relative to the colonial and mandated territories administered by Belgium (*q.v.*). Total area, 948,000 sq.mi.; total population (est. Dec. 31, 1939), 14,131,000.

History.—The Congo remained in 1941, as it was in 1940, one of the main assets of Belgian resistance, and its natural resources were one of the principal contributions of Belgium to the British war effort. On Jan. 21, two agreements, one economic and the other financial, were signed in London. The first provided that certain raw materials produced in the Congo, particularly those necessary to the prosecution of the war, would be sold to Great Britain. The second fixed the value of the Congo franc at 176.625 to the £, and provided that the whole production of gold would be placed at the disposal of the Bank of England against payment in pounds sterling.

Although the Belgian government and the Congo administration had remained in complete agreement during the last six months of 1940, a prolonged visit of M. de Vleeschauwer, minister of colonies, brought about a closer contact, not only with the Belgian colony but also with the natives. The minister, in collaboration with the governor general, M. Ryckmans, took a series of measures necessitated by the circumstances and the changes brought about by the war in Belgium's trade. After paying a visit to Kenya and to South Africa, where he met Gen. Smuts, M. de Vleeschauwer returned to London in the late spring.

An important contingent of Congolese troops under the com-

Belgian Colonial Empire

Colony and Area sq. miles (approx.)	Population (000's omitted) (est. Dec. 31, 1939)	Capital, Status, Governors, etc.	Principal Products 1939 (in metric tons)	Imports and Exports (in thousand francs)	Road, Rail and Shipping 1939	Revenue and Expenditure (in thousand francs)
BELGIAN CONGO, 927,000	10,356	Leopoldville, colony, *Governor General:* M. Pierre Ryckmans	copper 121,500 gold 17,070 kg. coffee 23,000	(1938) imp. 1,022,637 exp. 1,807,154	rds. main, 3,206 mi.; other 39,718 mi.; rly. 3,051 mi.; shpg. cleared 132,673 net tons	(est. 1940) rev. 747,208 exp. 779,821
RUANDA and URUNDI, 21,200	3,775	Nianza (Ruanda), Kitega (Urundi), mandated territory united administratively with the Belgian Congo	coffee (export) 4,950 tons tin (export) 1,556 tons	(1939) imp. 55,041 exp. 83,855	roads open to traffic, 1,747 mi.	United administratively with the Belgian Congo

mand of Gen. Gillaert took part in the operations pursued during the summer against the Italians in Abyssinia. They distinguished themselves on several occasions, particularly in the conquest of the Galla Sidano, where 1,200 Italians and 2,000 native soldiers were made prisoners. This action led to the capitulation of 15,000 men, the total Italian forces south of the Blue Nile. (E. CA.)

Belgian Congo: *see* BELGIAN COLONIAL EMPIRE.

Belgium. Area 11,775 sq.mi.; pop. (est. Dec. 31, 1939), 8,396,276; chief towns (pop. Dec. 31, 1938): Brussels and suburbs (cap., 912,774); Antwerp (273,317); Ghent (162,858); Liége (162,229). Ruler: King Leopold III; prime minister (in exile): Hubert Pierlot; languages: French and Flemish; religion: Christian (mainly Roman Catholic).

History.—Events connected with Belgium in 1941 may be roughly divided into two groups, the one concerned with the activity of the government and the refugees in Great Britain, and the other with the attitude of 8,000,000 people who remained under German occupation.

Belgian Government in Great Britain.—As soon as the Belgian ministers were able to reach London after the collapse of France, they took a series of measures to bring into the war effort all the country's remaining resources. All Belgian men of military age in Great Britain and elsewhere were called up. By 1941 they formed, with the veterans of the 1940 campaign who were able to escape, the nucleus of a new Belgian army and air force. A large proportion of the Belgian merchant navy joined in the war effort, with a number of fishermen, munition and agricultural workers. The devotion to duty of airmen and sailors was on several occasions acknowledged by the British authorities. Belgian man power was completely mobilized.

The same may be said of economic and financial resources. An agreement signed Jan. 21, 1941, between the British and Belgian governments, placed the reserves of the Congo, in gold and war material, at the disposal of the British empire (*see* BELGIAN COLONIAL EMPIRE).

The misunderstandings which arose in 1940 concerning King Leopold, his conduct of military operations and the surrender of the Belgian army, were the subject of several publications, including *The Prisoner of Laeken,* by Emile Cammaerts, and the official *Grey Book* issued in September by the Belgian ministry of foreign affairs. Two British cabinet ministers, Anthony Eden and Oliver Lyttelton, paid homage to the dignified attitude of the Belgian sovereign who, by his refusal to collaborate in any way with the occupying power, had become the centre of resistance of the Belgian people at home and abroad.

On June 12 the Belgian government joined in the common declaration of collaboration in war and peace adopted by the representatives of the Allied nations, convened at St. James's palace by Prime Minister Churchill. They also joined in the resolution passed at the second meeting of the Allied council in September, endorsing the eight points of the Atlantic charter.

The Belgian People Under German Occupation.—From the beginning of the year it was apparent that the German authorities would be as powerless to conciliate Belgian opposition during World War II as during World War I. Their efforts to enlist support through the action of a few fifth columnists succeeded only in discrediting the few Rexist and Separatist leaders who lent themselves to this manoeuvre. Resistance was stiffened through the influence of the clergy and the trade unions. Although these unions and societies, whether Catholic or Socialist, had been dissolved or placed under German control, they retained a considerable influence, and the German press on many occasions expressed its dissatisfaction at the unwillingness of Belgian workers to increase production or to go and work in Germany. Only the threat of starvation compelled about 200,000 unemployed to do so. The removal of patriotic high officials from ministerial departments, and of a number of burgomasters and aldermen—among these the successor of Brussels' Burgomaster Max—increased the resistance already stirred by a number of seizures and requisitions. During the last months of the year, public demonstrations, the activity of the secret press, including a new *Libre Belgique,* and various acts of sabotage increased in gravity, and the Germans were compelled to resume the violent measures which their military leaders had adopted in 1914–18. Confinement in prison camps and individual sentences of imprisonment were replaced by the arrest of numerous hostages and their summary execution. The food situation grew more and more critical, and conditions made it likely that the life and health of the children of the poor would suffer gravely during the winter. Nevertheless, the spirit of the people and their faith in ultimate deliverance had never been so strong since the beginning of hostilities.

In a pastoral letter read in Belgian churches on Dec. 7 it was revealed that on Sept. 11 at Laeken castle King Leopold had married Mlle. Mary Lelia Baels, who took the name of Princess de Rethy. (E. CA.)

CHILDREN OF BELGIUM at a soup kitchen in 1941. Many children, according to an investigation by Herbert Hoover's Committee on Food for the Five Small Democracies, were so undernourished they could not attend school

Education.—In 1938: primary schools 8,712; scholars 955,038; higher schools 273; scholars 86,279; universities (1937–38) 4; students 10,776.

Banking and Finance.—Revenue, ordinary (est. 1940) 11,343,032,000 francs; expenditure, ordinary (est. 1940) 11,632,978,000 francs; public debt (Dec. 31, 1939) 59,318,300,000 francs; notes in circulation (Dec. 31, 1939) 27,994,000,000 francs; gold reserve (Dec. 31, 1939) 17,968,000,000 francs; exchange rate (average Jan.–March 1940) 1 belga = 16.88 U.S. cents.

Trade and Communication.—External trade (merchandise): imports (1939) 19,690,000,000 francs; exports (1939) 21,670,000,000 francs. Communications and transport: roads, suitable for motor traffic (1939) 6,571 mi.; railways, open to traffic, main (1939) 3,190 mi.; airways (1938), distance travelled 1,457,050 mi.; passenger mileage 8,255,980 mi.; baggage mileage 156,762 ton mi.; mail mileage 78,412 ton mi.; newspapers 52,504 ton mi. Shipping (July 1, 1939) 408,418 net tons; tonnage launched (July 1938–June 1939) 27,600 gross tons; vessels entered, in net tons (monthly average 1938) 2,497,000; (July 1939) 2,801,000; cleared (monthly average 1938) 2,502,000; (July 1939) 2,803,000; motor vehicles licensed (Dec. 31, 1938): 155,174 cars; 77,600 commercial; 67,016 cycles; receiving set licences (1938) 1,082,200; telephone subscribers, local (1938) 287,323.

Agriculture, Manufacturing, Mineral Production.—Production 1939 (in metric tons): wheat 349,000; oats 724,200; rye 349,400; potatoes 3,323,200; coal 29,847,000; pig iron and ferroalloys 3,068,000; steel 3,111,000; beet sugar 240,500; barley 51,000; butter 61,000; margarine 60,700; artificial silk 5,900. Industry and labour: industrial production (1929 = 100) (average 1939) 83.3; (Jan. 1940) 79.1; number wholly unemployed (average 1939) 195,211; (March 1940) 163,598.

Bell, Alexander (1887?–1941), British chief of the criminal investigation department of Scotland

Yard, started his career as a crime detector while he was a rookie policeman. Two factors were responsible for his rise to the head of Scotland Yard: a sharp nose for crime and an unimpressive appearance. In 1932 he became a national hero when he caught the ringleaders of the Dartmoor prison mutiny. Bell, a detective-sergeant at the time, was promoted to inspector and solved a sensational poison crime that further enhanced his reputation. He devoted his later years to investigating bucket-shop operators at which he was eminently successful because he looked like a "sucker" ripe for fleecing. Throughout his 30 years on the metropolitan police force, Bell relied heavily on reading in criminal psychology, and he left an extensive library on the subject. He died in London, July 5.

Benefactions: *see* DONATIONS AND BEQUESTS.

Bentonite. The production of bentonite in the United States in 1940 increased to 247,132 short tons. Much of the increased demand that had developed during later years had been as a substitute for fuller's earth as a filtering and bleaching agent in the refining of petroleum and also as a fluid mud to flush out the cuttings in well drilling. A number of minor uses are based on bentonite's peculiar property of absorbing large amounts of water to make an emulsion that remains in suspension indefinitely. (*See* also FULLER'S EARTH; MICA.) (G. A. Ro.)

Berenschot, Gerardus Johannes (1887–1941), Dutch soldier, born July 24, in Solok, Sumatra, was named commander in chief of the Netherlands Indies army in 1939. He helped mechanize the colony's army. Gen. Berenschot was killed in an aeroplane accident near the airport of Batavia, Netherlands Indies, Oct. 13.

Berg, Ernst Julius (1871–1941), U.S. electrophysicist and mathematician, was born Jan. 9 in Ostersund, Sweden. He studied engineering at the Royal Polytecknicum in Stockholm and went to the United States in 1892 to work as an assistant to Charles P. Steinmetz. Like Steinmetz, he worked as consulting engineer with the General Electric company in Schenectady, 1892–1909, and then joined the faculty at Union college, where he became dean of engineering in 1932. Dr. Berg was a pioneer in the radio field and in 1916 produced the first two-way voice program. He also made important contributions in developing rotary converters and in the field of electromagnetic radiation. He collaborated with Steinmetz on several technical books and with British mathematicians on calculations of value in electrical engineering. He died Sept. 9 in Schenectady, N.Y.

Bergson, Henri (1859–1941), French philosopher who disdained formula in thought and was author of the famous treatise on laughter (*Le Rire*), was born Oct. 18 in Paris. His departure from cut-and-dried presentation in his lectures drew crowded audiences at the Collège de France. In 1914, when he began a new series of lectures, French society women suddenly became "Bergson-conscious" and sent their grooms and valets to his classroom to hold seats for them. In 1918 the eminent French thinker gave up teaching because of ill-health, and his last important work, *The Two Sources of Morality and Religion,* was published in 1932. Bergson, who faded from the public eye after his retirement, reappeared in Dec. 1940.

The Vichy government passed a law barring all Jews from holding educational posts but exempted Dr. Bergson because of his contributions to French culture. The aged thinker refused, however, to accept the exemption, renounced all honours because of the discriminatory legislation and lived up to his own philosophy that "one should think like a man of action and act like a man of thought." Other later books by Bergson are *Reflexions sur le temps, l'espace et la vie, Le matérialisme actuel* (1932) and *La pensée et le mouvant* (1934). He died Jan. 4 in France. (See *Encyclopædia Britannica.*)

Berlin. The residence of Hohenzollern electors, kings and emperors from 1442 to 1918, and capital of the German reich since 1871, Berlin is the largest and most important city of Germany. Reorganized in 1920 to include several suburbs, greater Berlin in 1939 had an area of 332 sq.mi., and a population of 4,332,000. Its favourable situation in north Germany on the River Spree, between the Elbe and the Oder rivers, affords it cheap water transportation through Germany's wide-reaching system of rivers and canals. It is also the centre of Germany's network of railways, motor highways and commercial air lines. Politically important as the seat of the Prussian and German governments, it grew rapidly after 1860 as an industrial and banking centre. British bombing during 1940–41 destroyed the interior of the opera house and many other buildings. To lessen the danger from air attacks, important landmarks like the east-west axis highway, west of the Brandenburg Gate, were camouflaged with a great network of foliage. Many children were sent for safety to other parts of Germany. (S. B. F.)

Bermuda. A British insular colony, 580 mi. east of Cape Hatteras, with an appointed governor and an elected assembly; area, 19¼ sq.mi.; pop. (March 26, 1939), 30,516 (aside from semitransient tourists and members of the defense forces), of whom 62·9% were Negroes. Governor: Viscount Knollys (succeeded Lt. Gen. Sir Denis K. Bernard Aug. 27, 1941).

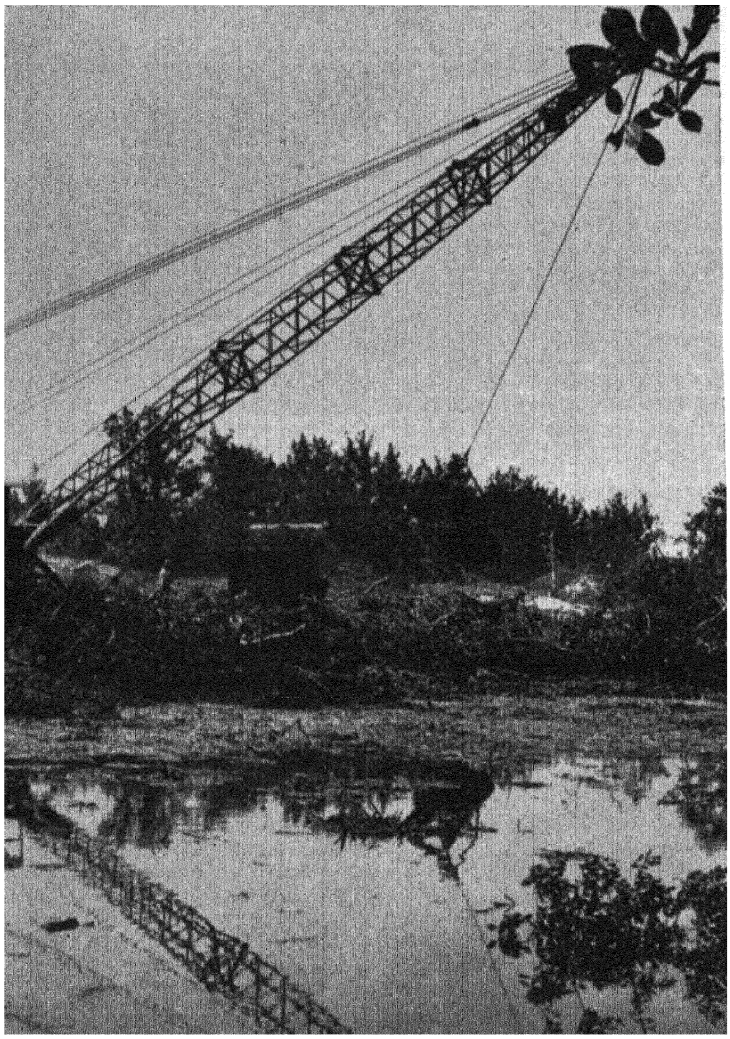
History.—World War II and its ramifications continued to dominate the course of events in Bermuda throughout 1941, with far-reaching economic and other consequences. The colony was not only a major centre of operations for prosecution of the war in the Atlantic, but also an outpost of western hemisphere defense. Although the tourist trade was but a third of normal, the addition of nearly 5,000 United States naval and air base personnel, an estimated 1,000 censors, and heavily increased British naval and other forces sharply strained the island's facilities, causing serious housing and water shortages and necessitating the shipment of fresh water from the U.S. mainland in July. Labour shortage was offset by the importation of 200 Barbadian Negro labourers.

In March the United States formally took over 526 ac., 1/13 of the colony's entire land area—acquired for naval and air bases in Sept. 1940. The base was formally commissioned on July 1, as "Kindley field," and by the end of the year an estimated 4,500 United States marine and other forces were in Bermuda. The necessary eviction of families from the acquired areas aroused considerable local resentment, as did fears that sovereignty of the islands themselves would be transferred to the United States. These were vociferously aired in the Bermudian assembly. The assembly, too, expressed its disapproval of the British policy of appointing military men to govern the colony. Of more constructive nature was its action in lifting Bermuda's half-century-old ban on the use of automobiles.

Education.—Bermuda had 30 government-aided schools in 1941, with enrolment of nearly 5,000, more than 15% of the whole population.

Finance.—The monetary unit is the pound sterling (about $4.03½). With the influx of United States military and naval forces in 1941, agitation was directed toward a shift to a decimal system of currency.

Trade and Resources.—In 1940 imports, chiefly foodstuffs and manufactured goods, totalled £1,469,504 (1939: £1,750,536), with 40.8% from the United States (1939: 46.4%), 24.2% from Canada (1939: 16.4%) and 22.7% from Great Britain (1939: 27.2%). The decline in imports from the United States was due to restrictions on purchases from non-empire countries. In the first nine months of 1941, the total reached £1,659,039, promising to equal or exceed the 1931 all-time record.



LARGE DRAGLINE excavators were common sights in Bermuda during 1941 as U.S. army engineers filled swamps, cleared land and blasted rock to prepare the leased air bases there

Exports, chiefly cut flowers, lily bulbs and fresh vegetables, were £83,608 in 1940 (1939: £115,656). The disparity between exports and imports was accounted for by tourist expenditures and, during 1940 and 1941, by military and naval outlays in connection with war operations. In 1940, 25,521 tourists visited Bermuda, less than a third of the prewar average, including 10,200 from the United States, 1,800 from Great Britain, and 12,932, chiefly North Americans, on cruise ships.

Communication.—Bermuda is a main station on the Pan American Airways transatlantic route.

Under normal conditions it has frequent, regular steamship communication with the United States, Canada and Europe.

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Bertrand, Louis (1866–1941), French author, was born March 20 at Spincourt (Meuse). He was received into the French Academy in 1925 and was renowned as a novelist, historian and historical biographer. Among his later works were *Carthage* (1930), *Les Martyrs Africains* (1930), *Le Roman de la Conquête* (1931), *Histoire d'Espagne* (1932) and *Le Livre de Consolation* (1934). Bertrand died at his villa in Cap d'Antibes, Dec. 6. (See *Encyclopædia Britannica.*)

Beryllium. Demand for beryllium increased substantially in 1940, the most important of the products being copper alloys with 1·75–2·25% Be. The master alloy with 4% Be was quoted throughout the year at $15 per pound of contained Be. Early in 1941 it was announced that plant facilities were being installed for the commercial production of master alloys with nickel, containing 10%, 15% and 20% Be, using powder metallurgy.

Imports of beryl into the United States rose to 805 short tons in 1940, 422 tons from Argentina, 377 tons from Brazil and 6 tons from South Africa.

Future production of beryl in Argentina will be treated in a local plant to produce a mixed oxide and carbonate containing 80% BeO, which will be shipped to the United States of America in brick form. Trade treaty negotiations included a proposed reduction of the normal United States imports duty of 25%.

There had been two attempts to exploit beryl deposits in Canada, one in Ontario and one in Manitoba, but no late information was at hand on progress. (G. A. RO.)

Bessarabia: *see* WORLD WAR II; RUMANIA; UNION OF SOVIET SOCIALIST REPUBLICS.

Best Sellers: *see* PUBLISHING (BOOK): *Best Sellers.*

Betatron: *see* PHYSICS.

Bevin, Ernest (1884–), British labour leader and statesman. In his youth he was a truck driver in the vicinity of Bristol; later he became interested in trade unions and was elected general secretary of the Transport and General Workers' union. In 1937 he was appointed chairman of the General Council of Trades Union congress. On May 13, 1940 Churchill named him minister of labour and national service, and he was promoted to the war cabinet on Oct. 3. In these offices he showed great energy in helping to stiffen Britain's war effort by securing the collaboration of the working classes.

When the government set up three "executive" groups for production, imports and postwar policy Jan. 6, 1941, Bevin was assigned to head the production division. This appointment was apparently designed to bring labour and employers closer into a joint war effort.

Throughout the rest of the year Bevin spoke, wrote and worked to speed up production. In July he announced the formation of joint labour-employer boards in war industries. In November he warned that wartime shortages in Britain demanded drastic measures, including the drafting of 1,000,000 married women to work in munitions factories.

Bibesco, Prince Georges Valentin (1880–1941), Rumanian aeronautical pioneer, was born April 23 in Bucharest, a descendant of Napoleon and grandson of a Walachian prince. He developed an enthusiasm for aviation after meeting Wilbur Wright at Le Mans, France, in 1908. The following year he received his aeroplane licence, the 20th international licence issued, and he became a pilot for Louis Bleriot. He then returned to Rumania, where he became commander in chief of the Rumanian air force during the Balkan war of 1913. In 1930 he was elected president of the International Aeronautical federation.

The federation received word on July 3 that Prince Bibesco had died in Bucharest.

Bible Society, American: *see* AMERICAN BIBLE SOCIETY.

Bicycling: *see* CYCLING.

Biddle, Francis (1886–), U.S. politician, 58th attorney general of the U.S. and great-great-grandson of Edmund Randolph, the first U.S. attorney general, was born May 9 in Paris. A scion of the Philadelphia Biddles, he attended Groton and then Harvard, where he received his law degree *cum laude* in 1911. After spending a year as private secretary to Oliver Wendell Holmes, supreme court justice, he was admitted to the Pennsylvania bar in 1912. He then ventured into politics, stumped for Theodore Roosevelt in the 1912 and 1916 campaigns, and ran, unsuccessfully, for the senate in 1914. He was special assistant

U.S. attorney in eastern Pennsylvania, 1922–26. An ardent New Dealer, he was appointed chairman of the National Labor Relations board in 1934. In 1938–39, he was chief counsel for the joint congressional committee investigating the Tennessee Valley authority. He was judge of the third U.S. circuit court of appeals, 1939–40, and was called from that post to become acting attorney general in June 1941 and was appointed attorney general by Pres. Roosevelt on Aug. 25, 1941. A staunch defender of civil liberties, Biddle frequently warned against mob hysteria in fighting the fifth column peril in the U.S., adding that aliens should be treated without "malice or race hatred."

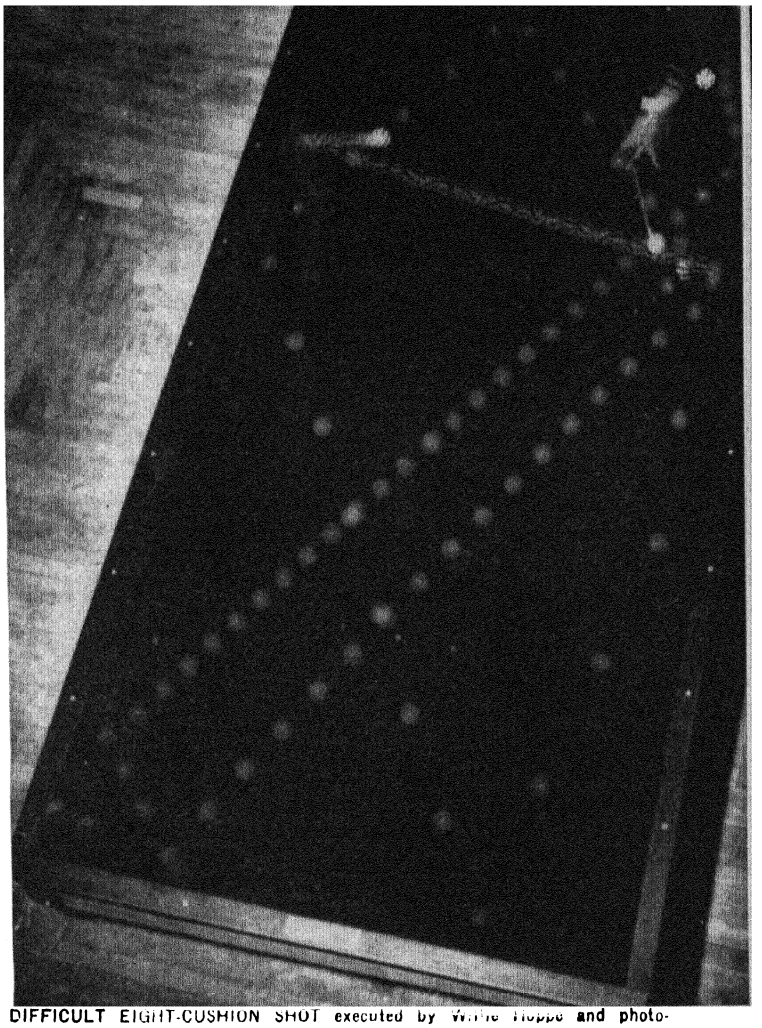
Biggers, John David (1888–), U.S. industrialist was born Dec. 19 at St. Louis and was educated at Washington university in that city and at the University of Michigan, where he received his bachelor's degree in 1909. After several years (1910–14) with the Detroit board of commerce and the Toledo, O., chamber of commerce, he became assistant treasurer of the Owens Bottle company at Toledo, and had advanced to vice president by 1926, when he also became managing director of Dodge Brothers of Britain, Ltd., in London. In 1930 he was named president of the Libbey-Owens-Ford Glass company in Toledo. In 1937–38 he directed the U.S. census of unemployment. Biggers was named deputy commissioner under William S. Knudsen (*q.v.*) on the U.S. Council of National Defense June 5, 1940. His special concern was industrial production for armaments. When the Office of Production Management (*q.v.*) was created by President Roosevelt Jan. 7, 1941, Biggers became executive director of the production division.

Biggers left the OPM late in Aug. 1941 to become U.S. minister to London. He arrived there Sept. 12 and during the next few weeks devoted himself to problems of production in connection with the lend-lease program. On Oct. 17 he returned to the United States, and on Oct. 30 President Roosevelt granted him a leave of absence to return to his position with the Libbey-Owens-Ford company.

Billiards. Once again the name Willie Hoppe led the billiard world as the veteran New Yorker successfully defended the three-cushion championship against a star-studded field at Chicago. While engaging Jake Schaefer in a challenge match on the eve of the tournament, Hoppe was stricken with pneumonia. He collapsed at the table and was rushed to a hospital, where his life hung in the balance. Overcoming the illness, Hoppe's start in the competition was delayed 16 days—he went into action and won 13 games in a row before losing to Welker Cochran. It will be recalled that in 1940 Hoppe won the title with the unprecedented string of 20 straight victories, so he made it 33 in a row before bowing; and concluded with a record of 36 out of 37.

A new rule, designed to eliminate safety play and speed up the game, was adopted during 1941 by the National Billiard association, the governing body of the sport. In the future a player will have a choice of starting with either white ball at the beginning of each half-inning. The old rule was in effect in the Chicago tournament.

In pocket billiards, a new ruler ascended to the throne in the person of Erwin Rudolph, 47-year-old expert from Cleveland, Ohio. Rudolph has held the crown four different times. His victory was at Philadelphia, Pa., where the round-robin competition was staged over a three-week period. At the completion of the regularly scheduled matches Rudolph, Irving Crane of Livonia, N.Y., and Willie Mosconi of Philadelphia, the defender, were deadlocked. In the three-cornered play-off, Rudolph gained the laurels by taking the measure of Crane in the final. (L. Ef.)



DIFFICULT EIGHT-CUSHION SHOT executed by Willie Hoppe and photographed in 1941 with a repetitive-flash camera

Biochemistry. Outstanding advances during 1941 concerned enzymes, vitamins, hormones and metabolism.

Enzymes.—A new enzyme, cytochrome C reductase, was separated in a partially purified form. The substance is a flavoprotein and is a necessary intermediate catalyst in the oxidation reduction chain between hexose monophosphate and cytochrome C. Another new enzyme, cytochrome C peroxidase, contains haemin and specifically catalyzes the decomposition of hydrogen peroxide by cytochrome C.

Vitamins.—Remarkable advances were made in the knowledge of the chemistry of biotin and its action. Biotin is the same as vitamin H (anti-egg white factor) and coenzyme R. This is another illustration of the interlocking of enzymes and vitamins. In other words, the action of biotin in stimulating yeast or mammalian growth is as a coenzyme in metabolism. Although biotin was obtained in crystalline form its actual structure was not determined. It probably is a monocarboxylic acid containing sulphur and a cyclic urea structure. The antagonistic action of egg white to biotin is due to the chemical combination of biotin with avidin, the harmful ingredient from egg white. The combination of biotin with avidin is physiologically inactive, but the biotin activity can be regenerated by hydrolyzing in an autoclave. A new factor, follic acid, of importance in yeast nutrition, was separated in pure form from leaves. Inositol, an isomer of glucose, and widely distributed in nature, previously found to be of value in yeast nutrition, was recognized as the specific anti-alopecia factor for mice.

Use of Tracers or Labelled Atoms in Studying Metabolism.—The exact identities of the precursors of creatine were finally definitely proved to be arginine and glycine by feeding these amino acids containing isotopic nitrogen to rats. The amidine group of the arginine is definitely involved. Choline nitrogen is not involved, but the methyl groups in choline are. The long accepted view that carbon dioxide is utilized in the synthesis of urea in the mammalian liver was confirmed by showing that radioactive or isotopic carbon supplied as bicarbonate leads to the formation of urea containing these forms of carbon. More surprising was the discovery that animal tissues might utilize some carbon dioxide in intermediate carbohydrate metabolism. It was shown that bicarbonate containing radioactive carbon when supplied to the proper system of tissue and substrate or to rats in the proper nutritional condition led to the formation of carbohydrate or degradation products thereof containing labelled carbon. The very rapid synthesis of radioactive thyroxine by thyroid tissue was shown by injecting radioactive iodine into rats.

Studies on the Production of Fatty Livers.—The previously observed production of fatty livers in young animals kept on a high fat, low protein

diet, free from or very low in choline content, was confirmed. The addition of adequate choline to the diet prevents the development of fatty livers. The methyl groups essential for the choline formation or action may also be supplied by methionine, an amino acid containing one methyl group attached to sulphur. The transfer of methyl groups from methionine to choline in the synthesis of the latter in these studies was established by feeding methionine containing deuterium in its methyl groups and recovering the deuterium in part in the choline.

Fatty livers are also produced in rats kept on a fat-free diet containing ample vitamin B complex from liver, or as a substitute, a synthetic mixture of pure thiamin chloride, riboflavin, pantothenic acid, pyridoxine and biotin. From these studies it was concluded that biotin appears to be the main causative agent. Egg white inositol or lipocaic concentrates (from pancreas tissue), but not choline, inhibit this action of biotin. The fact that adrenalectomized rats poisoned by phosphorus and maintained by adequate salt intake on a high fat and low protein diet did not develop fatty livers unless they were also treated with a suprarenal cortex preparation might prove to be of significance in the endocrine control of metabolism. That the suprarenal glands are involved in intermediary metabolism was also indicated by the decreased rate of deamination of amino acids by kidney tissue from adrenalectomized rats.

Hormones.—Fractionation and purification studies on the hormones of the pituitary gland in 1941 led to the revival of an old hypothesis, viz., that the blood pressure raising (pressor) and uterine muscle contracting (oxytocic) activities are represented by one large protein molecule. However, other workers gave good evidence to the contrary; that is, that these two activities can be separated almost quantitatively by mild chemical and physical treatments. The evidence indicated that the two activities are represented by two easily separated substances of similar physical but different biological properties or that a hypothetical giant molecule is easily separated by mild chemical treatment into the two active components. (*See* also PHYSIOLOGY.) (F. C. K.)

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Biography: *see* AMERICAN LITERATURE; ENGLISH LITERATURE; CHILDREN'S BOOKS.

Biological Survey, Bureau of: *see* FISH AND WILDLIFE SERVICE.

Biology: *see* BOTANY; MARINE BIOLOGY; ZOOLOGY.

Bird Refuges: see FISH AND WILDLIFE SERVICE.

Birdseye, Claude Hale (1878–1941), U.S. topographic engineer, was born Feb. 13 at Syracuse, N.Y. On graduating from Oberlin college in 1901, he took a teaching post at the University of Cincinnati. He later became topographer for the U.S. geological survey and then surveyor for the general land office. From 1932 until his death, he was assistant to the director of the geological survey. Among his outstanding achievements were the mapping of the Kilauea volcano region in Hawaii in 1912, the surveying and mapping of the summit of Mt. Rainier in 1913 and a survey of the Colorado river from Lee's Ferry, Ariz., to the mouth of the canyon in 1923. He was decorated by the French government in 1919 and won the Daly medal of the American Geographical society in 1924. He was a colonel engineer of the Officers' Reserve corps at the time of his death in Washington, D.C., May 30.

Birth Control. The world picture abroad was dark and confused during 1941. Except for Sweden, information on clinical service on the birth control movement in other countries in Europe could not be obtained. Constant and relentless pressure on the conquered nations, food rationing and requisition by Germany of supplies from every country overrun resulted in lowered birth rates.

This form of birth control is dysgenic in the extreme; but no sane population policy could be adopted as long as Germany dominated Europe, and until world reconstruction programs included, as one essential for enduring peace, a consideration of the need for solving problems of overpopulation in relation to national resources.

Australia.—Vital statistics for Australia showed a slight rise in the birth rate of 1941 over that of 1940, and a sharp increase in the number of marriages, with their rate, 11.8 per 1,000 population, the highest on record. Established birth control clinics continued their work.

Cuba.—Efforts to establish birth control centres in the island were stimulated by lectures before the Gynecological association of the island, and publication of a new illustrated pamphlet on contraceptive technique, by a leading gynaecologist, received wide circulation among the medical profession.

England.—Branch clinics of the Family Planning association in the worst bombed areas of the provinces had extraordinary escapes from serious damage and were carrying on at the close of 1941. Some of the centres in or near London and the southeastern districts were temporarily suspended. Headquarters of the association were evacuated to Bournemouth late in 1940, with a small staff at the London office.

France.—Adoption of more drastic regulations against birth control and abortion failed to stem the fall in France's birth rate, nor has increase in family allowances had any such result. Food rationing resulted in a drop in the average weight of infants born and Germany's failure to release the 1,500,000 French prisoners held outside France tended to further reduce the birth rate.

Germany.—Germany endeavoured to raise its marriage rate by allowing soldiers at the front in any country to marry by proxy. Illegitimate births were officially stimulated and encouraged. In spite of all regulations against the sale of contraceptives, sales continued. Live births in the reich were reported increasing, but figures were contrasted with those of 1939. Civil statistics for the first quarter of 1941 showed them to be 24.5% less than in the corresponding quarter of 1940, however.

India.—Progress in organization of birth control work was reported to the Family Planning association by its organizer in that country. The last census in 1940 credited India with a population of 400,000,000, an increase of 18% in 10 years.

Japan.—By official decree a higher birth rate was ordered in Japan in 1941. The objectives are a perpetual population increase, so that other nations can be outrivalled in quantity and rate of increase, and industry and military manpower maintained. Birth control was rigorously suppressed, but in spite of this and of threats and inducements, the birth rate did not go up as fast as expected. Infant mortality rates, however, increased, and malnutrition was prevalent.

New Zealand.—The Family Planning association stimulated the passage at many meetings of a resolution asking the dean of the medical school of Otago university, the only medical school in New Zealand, to include a course in contraceptive technique in training the students there.

Norway.—All Norwegian birth control centres were closed by the police, following German occupation of the country.

Sweden.—The Swedish Society for Sexual Enlightenment continued work during the year and its Stockholm Birth Control clinic advised many women. The society collected funds to open a home for deserted mothers and provide relief for them.

Puerto Rico.—There was a steady increase in the number of clinic services under the direction of the Association Pro Salud Maternal e Infantil de Puerto Rico. These services were medically directed, and research studies on them were being undertaken to determine rates of effectiveness and acceptability of the methods advised. An interdepartmental committee appointed by President Roosevelt to survey Puerto Rico reported that overpopulation was the greatest problem of the island and that "birth control should be made a major function of the Insular Department of Health, as the key to the entire health situation in Puerto Rico."

United States.—*Population.* Final figures of the 1940 census showed an increase of almost 9,000,000 during the decade, in spite of ten years of depression and the lowest marriage rates in many years. Both marriage and birth rates rose in 1941 and forecast was for a birth rate of 18.5 for the year. Number of family units in the country increased 16.6% during the decade, though the average number of persons declined slightly.

Birth Control Federation of America, Inc.—Thirty-four state organizations were affiliated with the federation in 1941. The year was one of marked progress and increased public support.

On Oct. 16, simultaneous anniversary observances were held in 32 cities throughout the U.S., commemorating the 25th anniversary of the founding of America's first birth control clinic by Margaret Sanger in Brooklyn in 1916, which was closed as a "public nuisance." Numerous articles in the lay and medical press commented on the growth of clinic service and the increasing recognition by public health agencies of the importance of contraceptive service in their own programs.

Alabama followed North and South Carolina as the third state to include birth control officially in its public health program, and reports on the programs in these states were requested by many public health officials in other states.

Field work of the federation was concentrated in the south where population studies indicated the greatest need for a program of family spacing, where infant and maternal mortality rates are highest, and where high fertility and poverty make living conditions most difficult. Prominent citizens of the south held a Third Southern Conference on Tomorrow's Children and formulated a practical program of action.

Clinical Service.—Birth control centres in the United States totalled 637 in Nov. 1941. Of these 118 were in hospitals, 206 in health departments and 313 in other quarters, while 283 were supported wholly or in part by public funds. More than 90% of public health officers answering a ques-

tionnaire stated they were in favour of using federal funds for such service.

Legislation.—Connecticut: A bill to amend the law and give doctors the right to advise patients on contraception, when medically indicated, passed the house but was defeated in the senate.

Massachusetts: An initiative petition signed by more than 44,000 voters was presented to the legislature in the form of a bill. After a hearing, the bill was referred by the legislature to the state supreme court, for an opinion on its constitutionality, the opposition claiming that a religious issue was involved. The court ruled that the bill was purely permissive and that no religious issue was a factor in the bill. The bill was later defeated by both houses. The necessary thousands of additional signatures were secured to put the question on the ballot in 1942. The opposition, led by Cardinal O'Connell of Boston, attempted to challenge the legality of the petition and prevent inclusion of the question on the ballot.

Legal.—The federal trade commission's action against falsely advertised or dangerous contraceptives continued, but trade in bootleg materials went on in spite of "cease and desist" orders and suit.

Medical Education was fostered by the distribution of more than 50,000 copies of a new pamphlet, "Techniques of Conception Control," by Robert L. Dickinson, M.D., and Woodbridge E. Morris, M.D., among medical schools, state and county medical societies, public health departments, hospitals, medical libraries and individual physicians. More than one-fourth of the leading medical schools of the U.S. were visited by a medical representative of the federation, resulting in the inclusion of contraception in some programs, and in others an increase in the time allotted to the subject of contraception. (*See* also CIVIL LIBERTY.) (M. SR.)

Birth Statistics. According to final reports there were 2,360,399 live births in the United States in 1940, with a corresponding birth rate of 17·9 per 1,000 total population. For the same year, England and Wales reported 607,131 births, and its birth rate was 14·6 per 1,000; Canada had 243,835 births with a birth rate of 21·4 per 1,000. A comparison of the birth rates in these countries for the first six months of 1941 with the corresponding period of 1940 shows an increase of 4·6% for 42 states in the United States and of 13% for 67 cities and towns of Canada. On the other hand, the great towns of England and Wales, including London, experienced a decrease of 21·2% in number of births from 1940 to 1941 over a period of comparison extending from January through August of each year. While the falling off in the birth rate in England and Wales may be attributed to wartime disruptions of normal family life, the rise in the United States and Canada may be associated with the general improvement in economic conditions and with an increase in marriage in 1939, perhaps, in part, in anticipation of draft laws and military service. Birth rates for the principal English-speaking countries for each year since 1921 are shown in the appended table.

Annual Birth Rates per 1,000 Total Population in the Principal English-speaking Countries, from 1921 to 1940

Year	United States	Canada	England and Wales	Scotland	Northern Ireland	Eire	Australia	New Zealand*	Union of South Africa (whites)
1921	24.2	29.4	22.4	25.2	23.6	19.7	21.9	23.4	28.4
1922	22.3	28.4	20.4	23.5	23.3	19.5	24.7	23.2	27.5
1923	22.2	26.7	19.7	22.9	23.9	20.5	23.7	22.0	26.7
1924	22.4	26.8	18.8	22.0	22.7	21.1	23.2	21.6	26.3
1925	21.5	26.1	18.3	21.4	22.0	20.8	22.9	21.2	26.5
1926	20.7	24.7	17.8	21.1	22.5	20.6	22.0	21.1	26.2
1927	20.6	24.3	16.6	19.9	21.3	20.3	21.6	20.3	26.0
1928	19.8	24.1	16.7	20.0	20.8	20.1	21.3	19.6	25.8
1929	18.9	23.5	16.3	19.2	20.5	19.8	20.2	19.0	26.2
1930	18.9	23.9	16.3	19.6	20.9	19.9	19.9	18.8	26.4
1931	18.0	23.2	15.8	19.0	20.7	19.5	18.2	18.4	25.4
1932	17.5	22.5	15.3	18.6	20.1	19.1	16.9	17.1	24.2
1933	16.6	20.9	14.4	17.6	19.6	19.4	16.8	16.6	23.6
1934	17.2	20.5	14.8	18.0	20.1	19.5	16.4	16.5	23.4
1935	17.0	20.3	14.7	17.8	19.5	19.6	16.6	16.2	24.2
1936	16.8	20.0	14.8	17.9	20.3	19.6	17.1	16.6	24.2
1937	17.1	19.8	14.9	17.6	19.8	19.2	17.4	17.3	24.9
1938	17.6	20.5	15.1	17.8	20.0	19.4	17.5	17.9	25.0
1939	17.3	20.3	14.9	17.4	19.5	19.1	17.7	18.8	25.4
1940	17.9	21.4	14.6	17.1	19.6	....	....	....	....

*Europeans excluding Maoris.

Birth rates in the United States are usually highest in the south and southwest and lowest in the northeast. Thus in 1940 New Mexico had 27·7 births per 1,000 population; Utah, 24·6; Mississippi, 24·1; and Arizona, 23·5. In the northeast, New Jersey had a birth rate of 14·1 per 1,000; New York, 14·6; Connecticut, 14·7; and Rhode Island, 15·1.

Among cities having 100,000 or more inhabitants according to the census of 1940, those recording the highest birth rates per 1,000 population were Camden, N.J., 29·6; Youngstown, O., 28·8; Peoria, Ill., 28·6; Salt Lake City, Utah, 28·3; and Sacramento, Calif., 27·6. The lowest birth rates per 1,000 were found in Reading, Pa., 12·0; Somerville, Mass., 12·7 (for 1939); Yonkers, N.Y., 13·4; San Francisco, Calif., 14·0; and New York city, 14·2.

There are two factors that may influence the birth rate of a community as usually reported. In the first place, it is to be expected that, other things being equal, the community with the higher proportion of its population within the reproductive ages will record the higher birth rate. Secondly, the presence of ample hospital facilities in large communities usually attracts cases for confinement from outlying districts.

The second of the foregoing considerations is particularly important in the interpretation of birth rates for urban and rural areas. For example, according to official vital statistics reports, rural districts of the United States in 1940 had a birth rate of 16·3 per 1,000, while for cities of 10,000 to 100,000 inhabitants, it was 21·8 and cities of 100,000 or more had a rate of 18·2. However, it is found on examining the completed records for 1938 (the latest for which the requisite data are available), that 17·2% of the births in cities of 100,000 or more were of nonresidents, cities of 10,000 to 100,000 had 31·2% nonresident births, and rural districts and cities of less than 10,000 had 8·9%.

Nearly all births in the United States are attended by either physicians or midwives. In 1940 nine out of every ten births received medical care, more than half of them in hospitals. Less than 10% of the births were attended by midwives and only one-half of 1% received no such attention. In urban areas, 98% of the births had medical attention, compared with 82·8% in rural areas. For the country as a whole, 96·4% of the white births were attended by physicians, while among the Negroes, the figure was 50·8%.

To compensate for this disadvantage, attendance by midwives in the case of Negro births was much more frequent than among white births.

There is a fairly definite geographic pattern in the extent to which medical attendance at birth varies within the United States. High percentages are usual in most of the northern and western states, while the smallest proportions of births attended by physicians are found in the south. Thus in 1939 the latest year of record, all births in Maine received medical attention; altogether, 20 states had 99% or more of their births attended by physicians. Although Mississippi was lowest on this list with 50·6% of births attended by physicians, it had 48·9% of its births attended by midwives, so that practically all confinements there had some professional care.

Reproductivity among American women is at a peak in the age group 20 to 24 years. Thus the birth records for 1939 indicating the number of cases of live births (counting twin births or triplets as a single case), according to the age of the mother, were: 48 per 1,000 women of all marital states of ages 15 to 19 years; 119 per 1,000 of ages 20 to 24 years; 109 at ages 25 to 29; 74 at ages 30 to 34; 41 at ages 35–39; and 14 at ages 40 to 44. (*See* also CENSUS, 1940.)

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Bismuth. Although no production figures are published, the United States is known to be the world's largest producer of bismuth, followed by Peru, Mexico and Canada, with minor amounts from several other countries. World production is estimated to be about 1,500 metric tons, of which the United States contributes nearly one-half. The output of Peru was 383 tons and of Mexico 185 tons in 1940, while Canada was probably somewhat higher than Mexico. (*See* also METALLURGY.)

(G. A. Ro.)

Blackouts: *see* PHOTOGRAPHY: *Blackout Bulbs;* MUNICIPAL GOVERNMENT.

Blackton. James Stuart (1875–1941), U.S. pioneer film producer, was born Jan. 5 in Sheffield, England, and went to the United States in his youth. After a brief career as a reporter and a painter, he became interested in motion pictures, and, together with a partner, he launched the Vitagraph company in 1896. Blackton produced many notable films of the silent screen era, among them *The Christian* and *The Battle Cry of Peace.* In 1925 he sold the Vitagraph company to Warner Brothers for a sum reported to be in excess of $1,000,000. He was wiped out, however, in the depression and in 1935 he became director of a federal work relief movie project. He died in Hollywood, Calif., Aug. 13.

Bloch, Claude Charles (1878–), U.S. naval officer, was born July 12 in Woodbury, Ky., the son of a Czechoslovak immigrant. After graduating from the naval academy in 1899, he served under "Fighting Bob" Evans in the Spanish-American War and was cited for rescuing Spaniards from the burning ships of Adm. Cervera's fleet. He saw service in the Philippines and in the Boxer rebellion. In 1918 he escorted troopships and merchantmen through Atlantic war zones to European ports. He was made a captain in 1921 and became chief of the navy ordnance bureau in Washington, 1923, commandant of the Washington navy yard, 1930, and commander of a training squadron scouting force, 1931. In 1936 he was commander of the battle force with the rank of admiral, and he was named commander in chief of the U.S. fleet in 1938. This office he retained until Jan. 6, 1940, when he was sent to Pearl Harbor as commandant of the 14th naval district. He was stationed at this post during the Japanese raid of Dec. 7, 1941.

Block, Paul (1877–1941), U.S. newspaper publisher, was born Nov. 2 in Elmira, N.Y. After studying at Cornell university, he returned to Elmira where he became an advertising solicitor for a newspaper. Two years later he went to New York city and there established his own newspaper advertising agency in 1897. Branching out in the publishing field, Block bought a number of newspapers on his own account, but later sold them to the Hearst chain. The Block chain was never very extensive and at his death consisted of only three newspapers, one in Pittsburgh and two in Toledo. Block was a virulent critic of President Roosevelt and the New Deal. In 1937, when the president named Senator Hugo Black to the supreme court, Block sent one of his Pittsburgh reporters to Alabama to investigate Justice Black's past links with the Ku Klux Klan. The ensuing "exposé" was hailed as a journalistic coup.

He died in New York city, June 22.

Blockade. It was believed that the maritime blockade* as effected by sea and air power in the Atlantic, the Mediterranean and the Pacific would be one of the major determinants of the outcome of World War II. The blockade of 1939, 1940 and 1941 had to a considerable degree pinched the civilian and military life of the axis. Although the war might be long and costly, so long as the British and United States fleets with Russian and Allied land power exerted the necessary pressure to deny access to raw materials and foodstuffs needed by the axis, it would not be possible for Germany, Japan and Italy to win.

Blockade is, in its generally accepted usage, the process by which a belligerent controls the ingress and egress of sea-borne trade to another belligerent. The interruption of communications subjects a belligerent to a severe stress of its general population as well as of its army and navy. Blockade concerns the interruption or stopping of sea communications and is a maritime method of war. A land blockade is enforced by direct control of bases, frontiers and physical occupation of bases. The status of the aeroplane and blockade was not clear in 1941.

Blockade may involve the control of neutral ships bound for neutral ports wherein the doctrine of "ultimate destination," "ultimate consumption" or even "substitution" may be involved in the case of contraband. For a discussion of these theories and principles one should consult the standard authorities on international law. Suffice it to say that a blockade is not binding unless it is rendered effective by force. In short, a "paper blockade" or a blockade that is ineffective is invalid according to the law of nations. "There is no such thing," says Stowell, "as a legitimate blockade of neutral ports and territories."

International law relative to submarine warfare was disregarded by Germany in 1914–18. Again in 1940 and 1941 the axis powers resorted to a ruthless submarine warfare with the indiscriminate laying of magnetic mines for the purpose of breaking Britain's blockade of the axis-controlled territory. This unilateral concept of total war scorned most international rules of war and treaty obligations as evidenced by Germany's unprovoked attacks on surrounding states and the treacherous Japanese attack on the U.S. fleet at Pearl Harbor, Dec. 7, 1941. This was then followed by bombing attacks on Manila and Singapore that killed many civilians, women and children. International law had no place in axis practices.

The fact that a blockade exists is generally promulgated by the blockader. A breach of blockade is usually followed by the capture and condemnation of a vessel and its cargo.

"It is agreed," writes the authority Hall, "that for a maritime blockade to be duly set up and maintained:

1. The belligerent must intend to institute it as a distinct and substantive measure of war, and his intention must have in some way been brought to the knowledge of the neutrals affected.
2. It must have been initiated under sufficient authority.
3. It must be maintained by sufficient and properly disposed force."

By this definition it is clear that contraband cargo, rights of visit and search, and seizure are closely associated with the practice of blockade.

In the days of sail and limited gun ranges, the sea blockade was maintained by a close blockade. This was particularly true in the wars of Great Britain against the French revolutionary governments and the French empire. To a degree the blockade was "close" in the Civil War when the federal navy by preventing the Confederacy from engaging in sea-borne commerce or receiving supplies, hastened the peace. British sea power in 1914–18 maintained such an effective sea blockade that despite Germany's desperate attempt to break the cordon of steel by submarine warfare, the population of the Central Powers was brought close to complete starvation. In 1941 the British fleet plus units of the United States navy had the enormous task of maintaining a blockade of practically all the continent of Europe and escorting vessels to the

*All assertions or opinions contained in the above article are the private ones of the writer and are not to be construed as official or reflecting the views of the navy department or the service at large.

British Isles through the counterblockade maintained in the Atlantic by the axis. Great Britain and the United States were transporting war materials and foodstuffs to the British Isles and the Suez canal area in the face of aggressive submarine warfare and aerial opposition on the part of Germany and Italy with axis bases in Norway, Denmark, Holland, France, Italy, Greece and northern Africa.

In its modern operation, a blockade is usually a "long range" one. This natural evolution of the blockade resulted from the advent of the mine, long-range shore batteries, the submarine, the aeroplane and the torpedo. The tactical or close blockade was seriously questioned as to its effectiveness after the Russo-Japanese War when Admiral Togo in front of Port Arthur lost two battleships by mines. This was one-third of the major force of the Japanese and compelled Togo to relinquish his grip on the port. The first large-scale example of the long-range blockade was that instituted by the royal navy from 1914 to 1918. This pattern, with modifications resulting from ever-changing conditions, was followed by the British in 1939–40 and '41. Cruisers, auxiliary cruisers and some major ships patrolled the seas at a distance of 500 mi. or more from shore while destroyers, submarines, motor torpedo boats and aircraft struck at coastal shipping, troop transports and axis men-of-war inshore. Trade from the Atlantic to the continent was practically nonexistent.

Germany and Italy had by a counterblockade, or in their interpretation of a blockade, attempted to sink all vessels carrying supplies of whatsoever nature to the British Isles or British possessions. To a degree, the axis was successful and until the United States navy was employed to augment the British fleet in the patrol of the north Atlantic and to escort shipping, the losses in merchant tonnage were alarming. Other factors also tended to effect this decrease in merchant tonnage. Secretary of the Navy Knox reported in Dec. 1941 that 14 German submarines were sunk or damaged by U.S. ships since the north Atlantic patrol was instituted.

The total of British, Allied and neutral ship losses from the beginning of the war until Dec. 1941 was more than 8,000,000 tons. The British claimed about 4,000,000 tons for axis losses of ships captured, sunk, seized or scuttled. In April 1941, British-Allied-neutral losses were at a high—597,193 tons.

British sea power commenced to exert its economic pressure on Germany at the very outbreak of World War II by a blockade that was defined as, "an act of war carried out by warships of a belligerent detailed to prevent access to or departure from a defined part of the enemy's coast." To maintain this blockade was the most difficult task that the royal navy had ever faced in its long history because of the advent of air power and the decided superiority of the nazis in this effective, fast, long-range weapon of war. Planes became the eyes of the submarine and gave the underwater weapon vital information on convoys and surface disposition of men-of-war. For years the royal navy, operating from the British Isles, had dominated the communications of the North sea, the English channel and the French coast, but with the fall of Norway, Denmark, the Low Countries and France the situation was radically changed. The disposition of the royal navy was also affected by the threat of an invasion of the British Isles, a possibility that had not been seriously considered since Napoleon's abortive attempt.

The royal navy went to stations on Sept. 3, 1939. A formal blockade was not declared but instead a proclamation of lists of contraband was made that covered practically all imports to Germany. As used in 1914 and today, blockade implies a major method of economic warfare. On Sept. 9, 1939, the British government stated that, "to prevent contraband from reaching the enemy, His Majesty's government will use their belligerent rights

IT ALL DEPENDS on which end you look through, decided Seibel of the *Richmond Times-Dispatch* in recording "Another Controversy" of 1941

to the full." The term "long distance economic blockade" is rather loosely used as meaning: all methods of stopping all supplies or trade to a belligerent. Economic warfare, aside from the physical disposition of ships in a blockade, requires highly organized machinery. In modern warfare it is exceedingly dangerous to stop merchant ships for visit and search on the high seas because of the danger of submarine or air attack. This necessitates that ships suspected of carrying contraband or of being in enemy service be sent to certain control ports for careful inspection.

The axis counterblockade required many British and American men-of-war for patrol, escort and convoy duty. With the exception of some raiders, few German or Italian surface men-of-war were at sea. The royal navy was in 1941 much occupied in cutting the sea lanes of Italy to northern Africa and at the same time fought to keep its own sea lanes open to the Suez canal and the empire of the east. Italy lost more than one-half of its effective sea power in these operations. It was believed that because of the British sea blockade as well as the loss of the fascist African empire of Ethiopia and Libya, Italy would be the first of the axis powers to collapse. The blockade was beginning to affect seriously Italy's ability to keep its ships in fuel and oil, make necessary repairs as well as secure much-needed raw materials. The blockade worked a great hardship on the Italian people. Military and naval morale was low. There was food for those who paid bootleg prices and it was reported that the German "observers" there usually had money and bought in large quantities. In Sept. 1941 there were 7,554 cases of bootlegging, hoarding and other offences violating the economic laws; and of these offences there were 6,592 convictions. Because of the relentless blockade food rationing was broadened to include all types of meats, including entrails.

The president of the United States in a radio address on Sept. 11, 1941, enunciated and to some extent extended the traditional American concept of "freedom of the seas." With a realization that Germany, by ruthless north Atlantic submarine warfare, was making serious inroads on American raw materials and the manufactured products carried in British bottoms, the president said:

> The time for active defense is now. . . . This is the time for prevention of attack. . . . In the waters which we deem necessary for our defense, American naval vessels and naval planes will no longer wait until axis submarines lurking under the surface of the water or axis raiders on the surface of the sea strike their deadly blows first.
>
> Upon our naval and air patrol—now operating in large numbers over a large expanse of the Atlantic ocean—falls the duty of maintaining the American policy of freedom of the seas—now. That means very simply and clearly that your patrolling vessels and planes will protect not only American merchant ships but ships of any flag—engaged in commerce in our defense waters.

This policy and the effective measures that followed struck a serious blow to Hitler's great hope of victory by nazi counter-blockade in the north Atlantic ocean. The British, who must import about one-fourth of all foodstuffs and raw materials, were losing ships at an alarming rate. The positive U.S. naval support and protection of British shipping and United States shipping had at the end of the year greatly reduced the merchant ship losses.

With the entrance of the United States into World War II on Dec. 7, 1941, the effect of naval blockade became world-wide. Before the German attack on Russia there were four major leaks in the British blockade. The most important was from North Africa where Italy was maintaining a precarious line of communication and bringing over some foodstuffs and minerals for axis consumption. The second was the Trans-Siberian railway, whereby some Latin-American countries sent some minerals and fats. The third was the LATI air line out of Brazil, which carried securities, intelligence reports and a small amount of strategic materials, and the fourth was the railroad across Iran that brought information, securities and some supplies to Germany. At the end of Dec. 1941, all these routes were closed. The Italians admitted that they maintained with difficulty a precarious line of communication to Africa.

The Anglo-American blockade pinched nazi life even though Germany's leaders prepared diligently to meet the situation. Food rationing became effective on Aug. 28, 1939. This remained in effect, with a further cut of 20% in meat rationing in May 1941. There was a call throughout the winter of 1941 for warm clothes for the German army on the Russian front.

The curtailment of the imports of Australian and Argentine wool had its effect in spite of the reported German success in the production of *Zelwoole* or synthetic fibres. As far as wardrobes were concerned the nazis were making the most of their reserves. Germany was taking all the foodstuffs possible from the occupied countries of Europe.

Economic war with its police force—blockade—is one of the most decisive factors in modern warfare. To strangle an enemy comprises a twofold task: First, to prevent by every possible means delivery of and access to the raw and manufactured materials necessary for enemy war effort. Second, to maintain the flow of war materials and foodstuffs necessary for one's own war effort. As a rule, a superiority of air and sea power will achieve both missions. Great Britain had in World War II a minister of economic warfare who co-ordinated the world-wide effort of the empire by employing all British trade agents and officials around the globe. The United States recognized the efficacy of an "all out" economic warfare against the axis and Vice-President Wallace was charged with the activities in this field.

In preparation for war and fearful of a blockade, Japan for some years accumulated stock piles of strategic raw materials and oil reserves. After Japan moved into Indo-China all credits were frozen in the United States. This affected Japan's spinning, weaving, rayon, steel, copper, rubber and other industries. The licensing system then cut off the Nipponese silk trade as well as that of furs, bristles, canned fish, camphor, toys and other commodities, for which the United States was the best market. The U.S. was compelled to take this action against a palpable enemy. It was a form of economic blockade.

The Japanese thrust at the Philippines, Borneo, Malaya and the Dutch East Indies was for the purpose of securing oil, rubber and tin. If Allied sea and air power, with sufficient army strength, could prevent or hinder for a time the southward aggression it was believed by most experts that Japan would be unable to prosecute a major war for a long period. Without new territory and much-needed raw materials both the stock piles of Germany and Japan would run low. (*See* also INTERNATIONAL LAW; SHIPPING, MERCHANT MARINE; SUBMARINE WARFARE; WORLD WAR II.)

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Blood Plasma: *see* MEDICINE.

Blood Pressure: *see* MEDICINE.

Blumenthal, George (1858–1941), U.S. banker and art collector, was born April 7 in Frankfurt-on-Main, Germany. He went to the United States in 1882 and became associated with a banking firm. After 32 years as a partner in the banking firm of Lazard Frères, he retired in 1925 to devote all his time to art and philanthropy. In 1928 he gave $1,000,000 to the Metropolitan Museum of Art in New York city, and his donations to the Mt. Sinai hospital, also in New York city, were said to have exceeded $2,000,000. Blumenthal also gave substantial contributions to French educational and medical institutions. In 1934 he was appointed president of the Metropolitan Museum of Art, a post he held until his death in New York city, June 26.

Board of Economic Warfare: *see* ECONOMIC WARFARE, BOARD OF.

Bock, Fedor von (1880–), German army officer, was born Dec. 3 at Kuestrin, near Berlin, and was educated at the Potsdam Military school. At the age of 17 he was assigned to an infantry guards regiment. He had advanced to a captaincy by the time of Germany's entry into World War I in 1914 and emerged from the war a major. In 1919 he became commander of the Peace army and in 1920 commander of the third army group, which post he retained for 18 years, until his appointment by Hitler as commander of the first army group in 1938. During the invasion of France in May and June 1940 he commanded the lower Somme army group. He was one of the 12 German generals created field marshals of the reich by Hitler on July 19, 1940.

In 1941 Hitler delegated to him command of the central German armies in the Russian campaign. Bock dealt the Russians some of their severest defeats in the early part of the campaign, notably at Bialystok and Minsk; also, later in the year, at Smolensk and Vyazma. He unleashed six separate major offensives against Moscow in the fall of 1941. The last, begun in November, fell short of its goal near Tula, Mozhaisk and Volokolamsk. Then Bock began his series of "orderly retreats" and "defensive actions." There were many reports at the end of the year that he had resigned, but none of them was confirmed in Berlin.

Bohemia and Moravia. A German protectorate in central Europe after March 16, 1939, formerly a part of Czechoslovakia. Area, 19,058 sq.mi. (Bohemia

12,525; Moravia 6,533); population, estimated about 7,000,000, of whom two-thirds are in Bohemia. Capital, Praha (Prague). Chief cities: Praha (848,823); Brno (264,925); Moravska Ostrava (125,347); Plzen (114,704); Olomouc (66,440). Religion: mainly Roman Catholic. President: Dr. Emil Hacha.

History.—Though the vast majority of the population is Czech and though a skeleton puppet administration exists for internal affairs, the administration of the country remained entirely in German hands in 1941. The Germans are not only exclusively responsible for the foreign affairs, the defense and the communications of the territory, but they manage also all its internal affairs. The protectorate formed, after Sept. 15, 1940, an integral part of the German Customs union and its whole economic life has been thoroughly co-ordinated with that of Germany. The process of Germanization was rapidly promoted by the occupation authorities. But the resentment of the Czech people grew as fast, and found its expression during 1941 in repeated acts of non-co-operation and direct sabotage. These acts represented the will of practically all classes and sections of the Czech nation. The pro-fascist group, called Vlajka, remained completely without any influence in spite of strong German backing. The great Czech national organizations, like the legionnaires of World War I, and especially the historically and numerically important gymnastic organization, Sokol, were dissolved.

The conflict between the Czechs and the "protector" came to its head at the end of September. The Reichsprotector, Baron Constantin von Neurath, was relieved of his duties and Reinhold Heydrich, the right-hand man of the chief of the gestapo, Heinrich Himmler, was appointed in his place. The prime minister of the autonomous Czech government, Gen. Alois Eliaš, was arrested and condemned to death for "preparing high treason." It is interesting that some of the men arrested and subsequently executed by the Germans were known as ardent "collaborationists," who like Gen. Eliaš had been appointed by the Germans to the offices. Among those executed, whose number amounted to many hundreds, were the mayor of Praha, Dr. Otto Klapka, Gen. Josef Bily, former army commander in Bohemia, Gen. Hugo Vojta, and several other high officers and officials, university professors and leading intellectuals, besides many men from all ranks and occupations. At the same time extreme measures were adopted against the Jews in Bohemia and Moravia; all their synagogues were closed and their deportation to eastern Poland ordered. The reprisals did not promote a better feeling on the part of the Czechs for the "new order." The hopes of practically all the Czechs were centred upon an American and Allied victory and upon the Czechoslovak government formed in London. (For activities of the government-in-exile during 1941, *see* CZECHOSLOVAKIA. *See* also RUTHENIA; SLOVAKIA.)

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Bois, Elie-Joseph (1878–1941), French newspaper editor, was born Feb. 2 at Vichy, France. After working for provincial newspapers, M. Bois at 20 went to Paris, where he free-lanced for many journals. In 1908 he joined the staff of *Le Temps* and in early 1914 became editor-in-chief of *Le Petit Parisien*, which under his direction became one of the most widely read newspapers in France. After the collapse of France in June 1940, M. Bois fled to London, where he wrote a number of articles on the nazi conquest of his homeland. He died at his home in London, April 27.

Bolivia, a South American inland republic on the southern Andean plateau; area: 419,470 sq.mi.; pop. (1941 est.): 3,457,000; chief cities (with est. pop.): La Paz, the capital

"AN UNDIPLOMATIC EXIT!" Cartoon comment of Duffy in the *Baltimore Sun* upon the Bolivian declaration of July 19, 1941, that the German minister was *persona non grata*

(202,000); Oruro (45,000); Cochabamba (37,000); Potosí (35,000); Sucre (32,000). Religion: predominantly Roman Catholic. President in 1941: Gen. Enrique Peñaranda.

History.—During 1941, Bolivia continued to benefit superficially from wartime demands for its mineral production, above all, for tin and tungsten; but rapidly mounting living costs brought on extensive strikes and unrest. By executive decree of Aug. 22 a 5% to 30% salary increase was ordered throughout Bolivia, but continued price rises caused serious railway and other strikes in October. Agreements with the United States for purchase of 18,000 tons of tin annually for five years (initiated in 1940) and of 3,000 tons of tungsten annually for three years gave promise of more substantial prosperity, once internal readjustments were effected.

Meanwhile, Bolivia's role of producer of essential strategic war materials and its long-continued internal unrest made it a focal point of axis intrigues. Nazi propagandists were active. To combat them, the government expropriated the German-owned Lloyd Bolivian airline (May 14). Rumours of a nazi putsch were active in June, and the situation reached white heat with the disclosure in July of an extensive plot in which German Minister Ernst Wendler was the driving force. President Peñaranda then acted with energy and dispatch, expelling Wendler, proclaiming a state of siege and ordering the arrest of many oppositionists. Nevertheless, the situation remained delicate throughout 1941.

Relations with the United States centred about problems of hemisphere defense, to which Bolivia gave strong support. But these relations were complicated by the question of Standard Oil company petroleum properties expropriated in 1937. This problem remained unadjusted at the end of 1941, although negotiations

were reported to be progressing satisfactorily. An important tungsten contract with the United States was made in the face of a Japanese offer of considerably higher unit price. Upon Japan's entry into the Pacific war, Bolivia gave strong support to the United States, severing relations with Germany, Italy and declaring war on Japan.

In Jan. 1941, Bolivia took part in the first Río de la Plata regional conference, at Montevideo, and under agreements made there acquired important rights of transit and special preferential trade rights.

Education.—Bolivia had some 2,000 primary schools in 1941, with more than 150,000 enrolment, and three universities. The 1941 budget allotted 79,000,000 bolivianos, or 14.1%, to education.

Defense.—The standing army was estimated in 1941 to number 14,000, with a reserve of 75,000, and an air force of 60 planes. A U.S. military mission replaced the Italian mission, which had been in charge of training until Oct. 1941. More than 25% of the 1941 budget was allotted to defense (145,000,000 bolivianos).

Finance.—The monetary unit is the boliviano (value: approx. 2 cents U.S.). National revenues in 1940 totalled 599,768,000 bolivianos, expenditures 505,000,000 bolivianos (est.). Revenues, derived extensively from export duties on metals, rose sharply in 1941. The foreign debt, approximately $53,600,000, was in complete default in 1941.

Trade and Communication.—External communication is by rail to Chile, especially, and to Peru and Argentina, and by Pan American airways to all parts of America. Construction of sections of a 680-km. railway from Santa Cruz to Corumbá, Brazil (with an eventual connection from there to the Atlantic coast), and of a further link from Santa Cruz to Vila Vila, near Cochabamba, continued during 1941. Expected U.S. financial aid to cover the estimated $33,000,000 cost was held up in 1941, however, when United States engineers recommended substitution of a paralleling highway at one-fourth of the cost. A further railway extension from the Argentine border to Santa Cruz was being financed by the Argentine government under an agreement of Feb. 11, 1941. The railway mileage in 1941 was in excess of 2,229 km. The Bolivian highway system included almost 900 mi. of the Pan American highway and nearly 5,000 mi. of other roads, with considerable additional mileage under construction. An internal air line, German-controlled until May 1941, when it was taken over by the Bolivian government, provides the only regular communication with some important areas, however.

Bolivia is the world's second largest producer of tin, which accounts for some two-thirds of all export values (72% in 1940). Under the international tin quota, an annual export of 46,778 tons is allotted. Actual export in 1940 was 38,531 tons, with a value 12.8% greater than all exports in 1939. In Sept. 1941, some 4,100 tons were exported, and the 1941 total was expected to reach the international tin quota allotment of 46,778 tons. Tungsten (2,002 tons in 1940), antimony (10,060 tons), silver (175,000 kg.), zinc (12,197 tons), copper (4,056 tons), lead (14,111 tons), gold (336 kg.) and other minerals account for practically all the exports. In 1940 increases in both volume and value were as high as 57% and 207% over 1939. During 1941, not only were there further substantial increases in tin, tungsten, antimony and zinc, but large long-term tin and tungsten contracts with the United States promised continued high production levels.

Foreign trade (officially reported in £ sterling) totalled as follows: Exports, 1939: £8,888,777; 1940: £12,877,211; imports, 1939: £4,848,358; 1940 (1st half): £2,474,986. In 1939, 64.4% of exports went to Great Britain, 16.8% to Belgium, 9.1% to the United States; in 1940 practically all were taken by Great Britain and the United States. In the year ending Aug. 31, 1941 (the second war year), exports to the United States were valued at $19,730,000, more than 12 times the figure for the corresponding period in 1938–39. Imports are chiefly manufactured goods from the United States and foodstuffs from Peru and Argentina. Import values during 1941 closely approximated the 1939 and 1940 levels.

Mining is the dominant industry; agriculture and grazing are insufficient for domestic needs, as is manufacturing. (L. W. Be.)

Bombing: *see* Munitions of War.

Bonds: *see* Stocks and Bonds.

Bonine, Fred N. (1863–1941), U.S. eye specialist, was born Oct. 21 in Niles, Mich. He studied at Freiburg, Germany, was graduated from the University of Michigan and took postgraduate work in European universities. On returning to the United States, Dr. Bonine took up practice in his father's office at Niles and established an international reputation as an eye specialist. He was credited with saving the sight of Jack Dempsey when the famous fighter's eye affliction threatened his career. Dr. Bonine died in Niles, Aug. 22.

Book-collecting. The accent on modern literature continued to be stressed in contemporary bibliophily. The late A. Edward Newton was a bridge linking the old school with the new, having, as he did, a taste sufficiently catholic to include the Caroline poets and Christopher Morley. A composite portrait of the new-school collector would depict a man in his early 30's who is a university graduate and a successful executive, usually in a field not intimately related to the arts. His chief cultural concern is the literature of his own day, and he reads books as well as collects them. He has some, perhaps considerable, aesthetic appreciation of externalities, and is therefore likely to have a due regard for fine printing.

Bibliographical activity during 1941 inevitably continued to concern itself chiefly with American books. The new (fourth) edition of Merle Johnson's *American First Editions,* edited by Jacob Blanck, evidenced a higher degree of selectivity in this field. The last previous edition listed 199 authors; 23 of these were dropped and 11 new names added. Blanck's bibliography of Harry Castlemon (Charles Austin Fosdick) is an excellent affirmation of a continuing interest in American juveniles. Harry Dichter and Elliott Shapiro collaborated to provide badly needed assistance to collectors in a fascinating field and produced *Early American Sheet Music, 1768–1889.* Dr. Thomas Franklin Currier, associate librarian emeritus of the Harvard college-library, whose monumental bibliography of John Greenleaf Whittier (1937) marked a milestone in meticulous research, reconstructing the poet no less than his books, pushed toward completion a bibliography of Oliver Wendell Holmes which should represent a parallel achievement.

The activities of the Bibliographical Society of America continued to reflect the enthusiasm of its broadened membership base and wider outlook on the panorama of the printed book. Carroll A. Wilson, as chairman of the society's publication committee, had the task of supervising the activities of a group of eager explorers of the bibliographic field. Rollo G. Silver's *Directory of Nineteenth Century American Publishers* is a significant manifestation of this committee's capacity for achievement.

The first issues of *American Notes and Queries,* which made their appearance during 1941, indicated the lively interest of the new school in pursuit of bibliographical and related minutiae.

The traffic in imported items suffered, of course, as a consequence of the battle of the Atlantic, but not to so great an extent as might have been supposed. So far as can be ascertained, only a single important shipment of books, consigned to a large New England university, was lost as a result of enemy action.

Sales.—The dispersal of the great A. Edward Newton library was the most important event of the year. The 2,007 lots brought a total of $376,560. The high point of the sale was the Ouvry-Carysfort-Proby copy of the first folio Shakespeare (1623), which brought $22,000. While this copy is known to have cost Mr. Newton in the neighbourhood of $60,000 some 15 years before, one of the executors of the estate pointed out that the securities represented in the purchase had originally cost Mr. Newton less than the auction figure, and that the same securities were once more worth rather less than the auction figure.

There was considerable sentimental buying at the Newton sale, and many books went for several times their shelf value solely because they had once been units in the library of the best-known and most widely read collector of his day.

Under the competent editorship of Edward Lazare, *American Book Prices Current Index, 1933–1940* appeared at the close of 1941, recording the fluctuations of the book market during the Roosevelt era. It was a noteworthy coincidence that the last important book auction of 1941 was the dispersal of the library of William H. Woodin, President Roosevelt's first secretary of the treasury.

Prices in general reflected the instability and uncertainty of the time. The auction trend was distinctly higher, particularly in the under-$1,000 group. The bargains were principally in the

higher brackets. On the other hand, many modern books brought prices that appear excessive when set alongside the figures at which many standard and time-tested lots changed hands.

A list of books, roughly 100, that brought $1,000 or more during the 1940–41 auction season, as compiled by the *American Bookfinder,* depicted graphically the resurgence of interest in the work of William Blake during the past quarter century. The Blakes were the bright particular stars of the Newton sale, as these statistics prove: *America, a Prophecy* (1793), $5,500; *Europe, a Prophecy* (1794), $8,000; *The First Book of Urizen* (1794), $8,250; *The Marriage of Heaven and Hell* (*c.* 1794), $6,300; *Songs of Innocence and Experience* (1794–95), $6,100. This census does not take into account the Blake water colours, which are outside the province of this comment, but which sold for comparable or better prices.

Other high prices brought during the 1941 season included: Gutenberg *Bible,* the *Apocalypse of St. John the Apostle,* complete, 16 leaves (*c.* 1455), $6,000; Boswell's *Johnson* (1791), one of two known copies with the uncancelled leaf citing Johnson's views on marital fidelity, $2,500; *The Scots Musical Museum* (1790–92), Robert Burns's copy, with about 3,000 words of interleaved autograph material, including several songs, $15,500; *Alice's Adventures in Wonderland* (1865), presentation copy of the subsequently suppressed first edition, $15,300; *The Game and Playe of Chesse* (*c.* 1483), written and printed by William Caxton, $6,800; Dickens's *Pickwick Papers* (1836–37), original parts, some defects, $3,500; Dante's *Divine Comedy* (1814), John Keats's copy, with autograph material in his hand and in that of Fanny Brawne, $7,000; Milton's *Comus* (1637), $7,900.

(J. T. W.)

Books: *see* CHILDREN'S BOOKS; PUBLISHING (BOOK); *see* also under AMERICAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE, etc.

Book Sales: *see* BOOK-COLLECTING.

Borates. The production of crude borates in the United States in 1940 declined about 1%, to 243,355 short tons, while exports of borax dropped about 30%, to 64,313 tons. Argentina was the next largest producer, followed by Italy and Turkey, but all three account for not more than 10–15% of the total. (G. A. Ro.)

Borglum, (John) Gutzon (De La Mothe)

(1871–1941), U.S. sculptor, was born March 25 in Idaho. Borglum once estimated that his gigantic sculpture of the faces of Washington, Jefferson, Lincoln and Theodore Roosevelt, carved in the granite cliffs of Mt. Rushmore, Black Hills of South Dakota, would last for several million years. The cost of this project, begun in 1927, was estimated at $1,520,000. Before his death Borglum finished the work on the heads, though the final touches remained to be completed from his drawings and models. The faces measure 60 ft. from chin to crown and are carved to the scale of men 465 ft. tall. Among his other works are "Wars of America," Newark, N.J.; "Sheridan Equestrian," Chicago; "North Carolina memorial," battlefield of Gettysburg, Pa.; "Woodrow Wilson memorial," which was presented by Ignace Paderewski in 1931 to the city of Poznan, Poland (this sculpture was reported destroyed by German armies in World War II); "Trail Drivers' memorial," San Antonio, Tex.; and the statue of Thomas Paine, Paris, France. During World War I, Borglum, who was also an expert aerodynamic engineer, was appointed by President Wilson to investigate inefficiency in aeroplane manufacture. He died in Chicago, March 6. (For further biographical information see *Encyclopædia Britannica.*)

Borneo. An island in the East Indies, divided politically into the British protectorate of Brunei; the independent states of North Borneo and Sarawak, both under British protection; and Dutch Borneo.

British Borneo.—Area, total *c.* 82,000 sq.mi.; pop. (est. Dec. 31, 1938) *c.* 790,000. Petroleum and natural gas are produced in considerable quantities, the total production of crude petroleum in 1939 being 939,000 metric tons. Large areas have been taken for the cultivation of Manila hemp.

Brunei: 2,226 sq.mi.: pop. (est. 1938) 38,000 (Malays 30,433); capital, Brunei Town; British resident, J. G. Black; ruler, Sultan Ahmed Tajudin.

North Borneo: c. 29,500 sq.mi.; pop. 302,174 (Chinese 53,000); capital, Sandakan; governor and commander-in-chief, C. R. Smith. Following the extension of war to the Pacific, a Dutch naval force landed in British North Borneo on Dec. 13 at British request and annihilated a Japanese settlement on the east coast. The Japanese made further landings, however.

Sarawak: c. 50,000 sq.mi.; pop. *c.* 450,000 (Malays, Dyaks, etc., *c.* 350,000; Chinese *c.* 100,000); capital, Kuching; ruler, Sir Charles Vyner Brooke (Rajah); language (official), English; religions, Mohammedan, Buddhist.

Japanese landings were made in mid-Dec. 1941, at Miri and Lubong. After destroying the oil refinery and installations in the Miri and Seria oilfields, British detachments in these areas were withdrawn.

Production.—*Brunei,* 1939 (exports): petroleum 776,027 tons; natural gas 1,181,891,000 cu.ft.; cutch 700 tons; rubber 1,285 tons. *North Borneo,* 1939 (exports): rubber 23,900 metric tons; copra 13,050 metric tons; sago flour 2,705 metric tons. *Sarawak,* 1940 (exports): benzene, kerosene oil and liquid fuel $11,036,330; rubber $26,167,140; gold $875,680; sago flour $2,184,997.

Overseas Trade.—*Brunei,* 1939: imports £379,373; exports £916,869. *North Borneo,* 1940: imports $9,978,419; exports $20,270,502. *Sarawak,* 1940: imports $32,645,192; exports $45,770,407.

Communication.—1938: roads, suitable for motor traffic: *Brunei* 102 mi.; *North Borneo* 236 mi.; *Sarawak* 101 miles. Railways open to traffic, *North Borneo* 125 miles.

Finance.—1940: Currency: Straits dollar ($1 = 2*s.*4*d.* = 47c U.S.).

	Brunei $	*North Borneo* $ (1939)	*Sarawak* $
Revenue	1,483,640	3,527,522	7,463,315
Expenditure	1,367,193	1,942,848	5,018,007

Dutch Borneo.—Area: western district, 56,664 sq.mi.; southern and eastern district, 151,621 sq.mi.; pop. total (census 1930) 2,194,533. Government: under the governor-general of the Netherlands Indies. A heavy Japanese raid on Pontianak on Dec. 19 resulted in considerable casualties and damage.

Boston. Ninth largest city of the United States, with a population of 770,816 by the federal census of 1940. Boston is a seaport at the head of Massachusetts bay and the capital of the state of Massachusetts. Area, 43·9 sq. mi., comprising most of Suffolk county. Mayor (Jan. 1, 1942): Maurice J. Tobin.

At the non-partisan elections held in Nov. 1941, Mayor Tobin (Dem.) defeated ex-governor James M. Curley (Dem.) in a strongly contested election by 125,318 to 116,430 in a total vote of 267,252. The tax rate in 1941 was $39.60 on an assessed valuation of $1,460,782,900, and the net bonded debt was $150,749,000. City employees numbered 18,540; the total departmental expenditures were $38,807,534.23. The overseers of the public welfare

expended $14,053,165. Relief and WPA employment declined markedly. The 1941 Community fund raised by 200 institutions in the metropolitan area amounted to $4,800,000.

Traffic difficulties were somewhat relieved by the Huntington ave. subway extension and the underpass at Massachusetts ave. Two miles of elevated railway on Atlantic ave. were condemned. The state bought the Boston airport to develop it further. Federal funds ($1,500,000) were secured for dredging a seaplane channel.

The *Boston Transcript*, a famous evening newspaper, discontinued publication. The noncommercial short-wave radio station, WRUL (Boston radio), broadcast propaganda to Europe and South America.

Boston was a leader among U.S. cities in civilian defense during the year. Mayor Tobin appointed a committee of public safety in June. Of the 23,000 volunteers engaged in civilian defense on Dec. 7, more than 5,000 had been trained as air-raid wardens and 2,000 as auxiliary firemen. The organization received its first trial in the false alarm of Dec. 9. The city was spending $150,000 on civilian defense at the end of the year.

Boston harbour was improved by the dredging of ship canals, and two piers were taken over by the army. The state appropriated $4,700,000 for the purchase and improvement of five Mystic river piers. A number of British warships visited the harbour for repairs in 1941, and warships and merchant ships were launched in steadily increasing numbers.

Of the total commerce of the port of Boston, imports accounted for $182,308,561 in the first eight months of 1941, a gain of 77·1% over the same period in 1940; exports were $15,925,548, a loss of 21·1%. War demands greatly reduced the number of ships calling at the port until Boston became an export centre for lend-lease goods in October.

Indices for Jan.–Nov. 1941 (average 1925–27 = 100) were as follows: manufacturing employment 96·1, a gain of 29·8%; manufacturers' payrolls 104·3, a gain of 47·9%; department store sales 73·7, a gain of 11·8%; total wages paid 93·5. Building permits in 1941 increased 42%. (S. J. McK.)

Botana, Natalio (1888–1941), Argentinian publisher, was born on a ranch near Sarranda Del Yi, Uruguay. A turbulent champion of the underprivileged, Botana fled Uruguay in 1913 after an abortive revolution and started a newspaper, *La Critica*, in Buenos Aires the same year. He revolutionized the treatment of news in Latin American journals, abandoning flowery literary style for direct writing; the circulation of the paper soared to 300,000.

After the overthrow of President Hipólito Irigoyen in 1931, General Uriburu suppressed *La Critica*, threw Botana into prison and later forced him into exile. In 1936 the Buenos Aires federal court acquitted Botana of charges filed by the German government that *La Critica* had libelled Adolf Hitler. Botana died in Jujuy, Argentina, Aug. 7, of injuries received in a motor car crash.

Botanical Gardens: *see* BOTANY.

Botany. By treating branches of a petunia plant with colchicine, A. B. Stout and Clyde Chandler (New York Bot. Garden) obtained tetraploid ($4n = 28$ chromosomes) branches while the other branches were in the usual haploid condition ($2n = 14$ chromosomes). The normal or diploid branches are self-incompatible (do not form seed when the pistil is pollinated with pollen from the same flower), but "self-pollinated flowers on the tetraploid branches on the same plants produced extra large capsules that were well filled with seeds." The change from self-incompatibility to self-compatibility resulted from the change from diploidy to tetraploidy.

From taxonomic, genetical and cytological evidence it had previously been suggested that common wheat, *Triticum vulgare*, originated from a natural cross between a wheat of the emmer type and a species of the related genus *Aegilops*. E. J. Britten and W. P. Thompson (Univ. of Saskatchewan, Saskatoon, Canada) made an artificial synthesis of a wheat with characters similar to that of common wheat, by crossing *T. turgidum* (with 14 chromosomes) with *A. speltoides* (with 7 chromosomes). This hybrid (with 21 chromosomes) was sterile but by treatment of the seedlings with colchicine the chromosome number was increased to 42 (which is that of common wheat) and the plants resulting were fully fertile, and had leaf, glume, keel and head characters similar to those of wheat.

Isolated *Datura stramonium* embryos, as small as 0·14 mm. in diameter and removed as early as 10 days after pollination, were grown successfully by J. van Overbeek, M. E. Conklin and A. F. Blakeslee (Calif. Inst. Tech., Pasadena, Calif.) provided a small amount of non-autoclaved coco-nut milk was added to the culture medium. At least three growth factors in coco-nut milk were recognized.

A species of the fungal genus *Neurospora* is able to synthesize its own requirements for *p*-aminobenzoic acid (one of the factors in the vitamin B complex) but when E. L. Tatum and G. W. Beadle (Stanford university, Calif.) exposed the fungus to X-radiation, a mutant was obtained which had lost the power to form *p*-aminobenzoic acid.

When adequate amounts of this substance were added the growth of the mutant was indistinguishable from that of the parent form. Certain chemicals could substitute partially for *p*-aminobenzoic acid, but not *o*- and *m*-aminobenzoic acids.

Previously it had been assumed that crown gall tumours were formed only by a direct stimulation by the causal organism (*Phytomonas tumefaciens*).

P. R. White and A. C. Braun (Rockefeller inst., Princeton, N.J.) found that the secondary tumours which developed in sunflower plants at some distance from the site of the primary tumour were bacteria-free. Tissue fragments were removed aseptically from the interior of such tumours and the bits of tumour tissue which were bacteria-free were grown by tissue culture methods.

One of these isolations went "through 13 successive passages, has been divided into 482 pieces, each several times as large as the original and has undergone a theoretical increase in volume of approximately 450,000 times." Some stimulus from the bacterium was essential for the induction in the host cells of the capacity to form galls but the maintenance of this capacity "is not dependent on the continued presence of the bacteria."

The "green snow" of Yellowstone National park was examined by Erzsébet Kol (Franz Joseph univ., Szeged, Hungary). The coloration is caused by the presence of immense quantities of algae (especially *Chlamydomonas yellowstonensis*), and a fewer number of certain other organisms.

The stems of a number of species normally growing in a prostrate position were induced by D. G. Langham (Inst. Exp. Agr., Caracas, Venezuela) to become erect by shading the stems. Growth habit was changed at will by changing the intensity of light.

C. E. Yarwood (Univ. of Calif., Berkeley, Calif.) found a diurnal cycle in the development of the asci of the peach leaf curl fungus (*Taphrina deformans*). "Asci start growth from ascogenous cells in the evening, nuclear divisions occur at night, and spores mature the following day. Ascospores are naturally discharged in greatest numbers in the evening with the maximum at about 8 P.M. . . ."

G. E. P. Smith (Univ. of Arizona, Tucson, Ariz.) found that

tamarisk (*Tamarix aphylla*), a rapidly growing tree, is alkali resistant, furnishes trunks which make good fence posts easily impregnated with creosote without the application of heat, and the wood proves to be of good cabinet quality with a handsome grain, suitable for desks, showcases, lamps, bowls, etc.

In 1879, Dr. W. J. Beal at Mich. Agr. Coll. started a test of the longevity of seeds of various species (20 or 21) of plants growing in the vicinity. The seeds were mixed with sand, placed in glass bottles, and buried approximately 18 inches below the ground surface. At intervals of five years up to 1920, and since then at intervals of ten years, a sample bottle has been removed and the number of seedlings produced by the various species has been recorded.

The tenth sample was removed and tested in 1940 by H. T. Darlington (Mich. State Coll., East Lansing, Mich.). Only four species produced seedlings in the 1940 test: *Oenothera biennis*, *Rumex crispus*, *Verbascum Blattaria* and *Silene noctiflora* (this last-named species not being listed as having been included originally and not presenting an appearance in any previous test). "Thus, only four species came through for the sixty-year trial as compared with five species for 1930 and eight for 1920." The marked drop in the germinations for the 1940 test may be related to the chipping out of a piece of glass from this bottle. (*See* also HORTICULTURE.)

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Botanical Gardens.—Cornell university published in 1941 a bulletin entitled *The Cornell Arboretum*. This speaks of adding 396 ac. to the arboretum, with other acquisitions along Fall and Cascadella creeks to follow.

The arboretum will ultimately become an extensive tract running north and south of the university with a large loop to the east. The work will be tied in with many phases of plant science in the university.

New York Botanical garden was fenced, thus eliminating through traffic and giving the garden for the first time defined limits. Educational facilities were extended especially for training in gardening.

Director Gager of Brooklyn Botanic garden received the Arthur Hoyt Scott gold medal and a cash award of $1,000 for his work in developing the garden as a scientific and educational institution during the 30 years of his directorship. The garden has added an ivy garden, 60 hardy species and varieties, to the 20 or more "gardens within a garden." Dr. Svenson has made a study of the littoral flora of Ecuador to compare with his former studies of the Galapagos flora and with Darwin's findings on geographic distribution of plants. Additions were made to the flowering cherry collection.

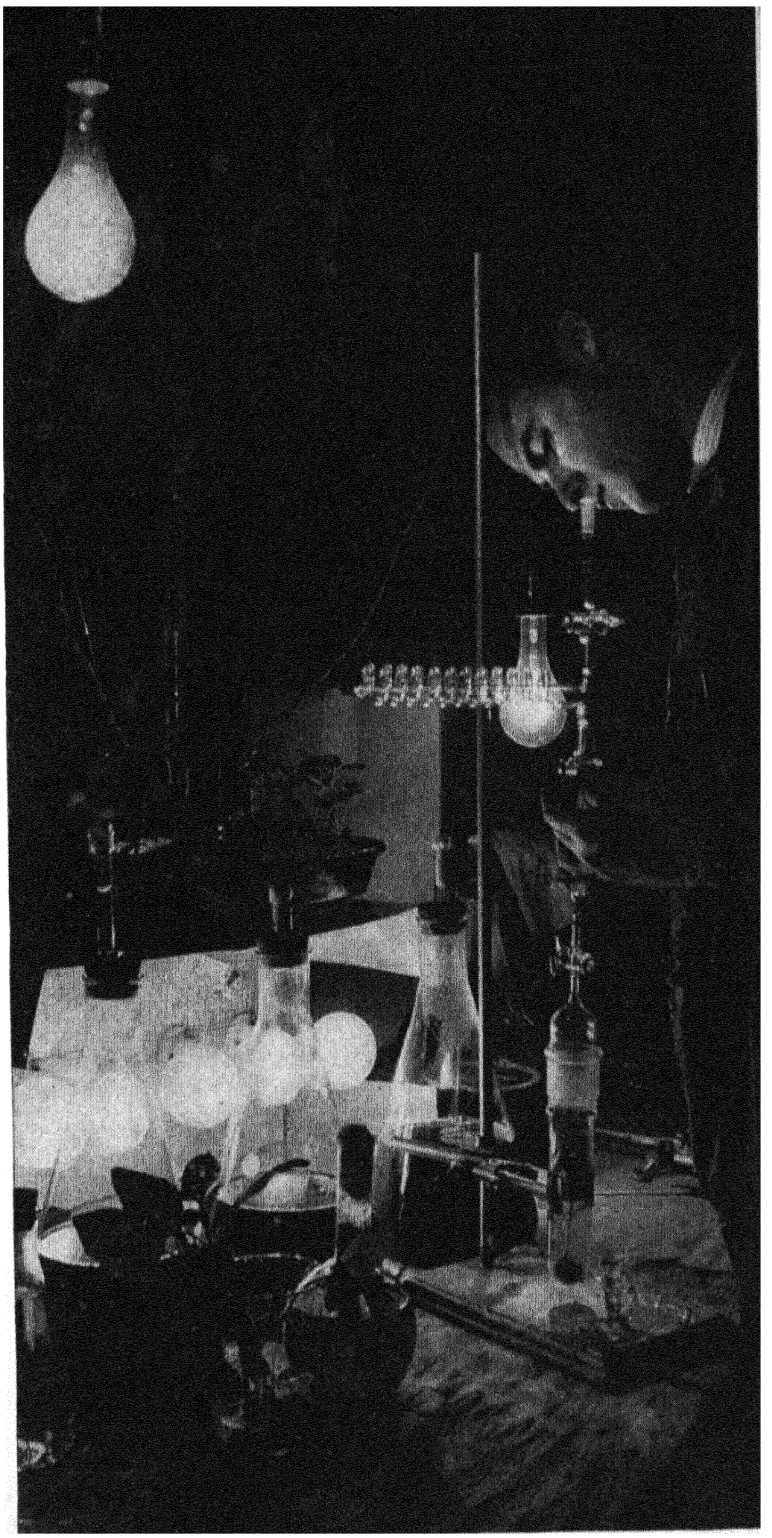
Missouri Botanical garden made great progress in construction of its new arboretum 35 mi. southwest of the city. The authorities also carried out various planting plans. At the city garden they had an exhibit of 15 new hybrid water lilies that they developed during 15 years of breeding. These were illustrated in colour in the March *Bulletin*.

Arnold arboretum published the second edition of *Rehder's Manual of Cultivated Trees and Shrubs*, also the *Merrill-Walker Bibliography of Eastern Asiatic Botany*. Both are monumental in the fields covered.

University of Wisconsin arboretum established a prairie nature trail on a 100-ac. plat. They were in 1941 also studying propagation and management of wild flowers to help eliminate the promiscuous gathering of these in the wild. University of Washington studied the propagation of *Calluna* and *Erica* and have a large collection of heathers. The Holden arboretum, Cleveland, Ohio, tested several species of rhododendron for hardiness in that region. Montreal Botanical garden emphasized the growing of model home vegetable gardens of city lot size (25x100 ft.) and of school gardens. Morton arboretum, Lisle, Ill., added to its hard road until it had 13 mi. within the arboretum.

No *Bulletins of Miscellaneous Information* were received from Royal Botanic gardens, Kew, after July 1940. The garden suffered material damage from bombs. (*See* also HORTICULTURE.)

(W. C.)



ARTIFICIAL PHOTOSYNTHESIS demonstrated in 1941 in the laboratories of the Carnegie institution at Stanford university, California. A small sunflower plant in the sealed glass tube at the right feeds on radioactive carbon dioxide introduced by a spiral tube. Electric bulbs take the place of sunlight in completing the process of photosynthesis

Bowling. This was in 1941 the leading competitive indoor sport in the U.S., played by about 12,000,000 persons on about 180,000 alleys in recreation centres, clubs, schools, etc. It was estimated that bowling represented an annual monetary turnover of some $350,000,000 for fees, dues, equipment, apparel, refreshments, etc.

Three all-time records were marked up during the 41st annual American Bowling congress tournament in St. Paul, Minn., from March 13 to May 6, 1941. The attendance of 150,000 was a new high. Twenty-five singles recorded totals of 700 or better. Two outstanding individual achievements were: the perfect 300 game rolled by William Haar, of Chicago, Ill., in the doubles, and a 299 game, by William Caskey, of Canton, O.

Ray Farness, of Madison, Wis., emerged as individual star, scoring 767, the highest score of the 1941 classic and the fifth highest in A.B.C. history, when he and William Lee took the doubles title with 1,346. Fred Ruff, of Belleville, Ill., won the singles title with 745. Top honours in the two-man event went to Bill Lee and Ray Farness; the five-man crown was won by the Vogel brothers combination from Forest Park, Ill. Harry Kelly, of South Bend, Ind., won the all-events title with 2,013. Mrs. Nancy Huff of Los Angeles, Calif., won the singles with 662.

(J. B. P.)

Boxing. As he did in 1937, 1938, 1939 and 1940, Joseph Louis Barrow, known to countless sport followers as Joe Louis, the "Brown Bomber," reigned supreme in boxing in 1941.

Other divisions of boxing were clouded in confusion and Louis's activities made the heavyweight ranks the most active in the sport. He defended his title seven times, knocking out all opponents who faced him, and bringing to 19 the number of times he risked his crown since the night in 1937 when he knocked out James J. Braddock in eight rounds of a bout held in Chicago, Ill.

Louis realized $347,678 in the aggregate from his two most important battles of the year, the first against Billy Conn, Pittsburgh boxer who voluntarily surrendered the world light-heavyweight championship for the chance to fight for the heavier and richer crown, and the second against Lou Nova, California challenger. Smaller purses realized from his five other championship battles, added to this sum, raised Louis's ring earnings from the start of his boxing career back in 1934 to slightly more than $2,180,000. By the close of 1941, only Jack Dempsey and Gene Tunney topped Louis as a "money-making champion." No titleholder, however, going back to the days of the great John L. Sullivan, ever defended his title as many times as Louis.

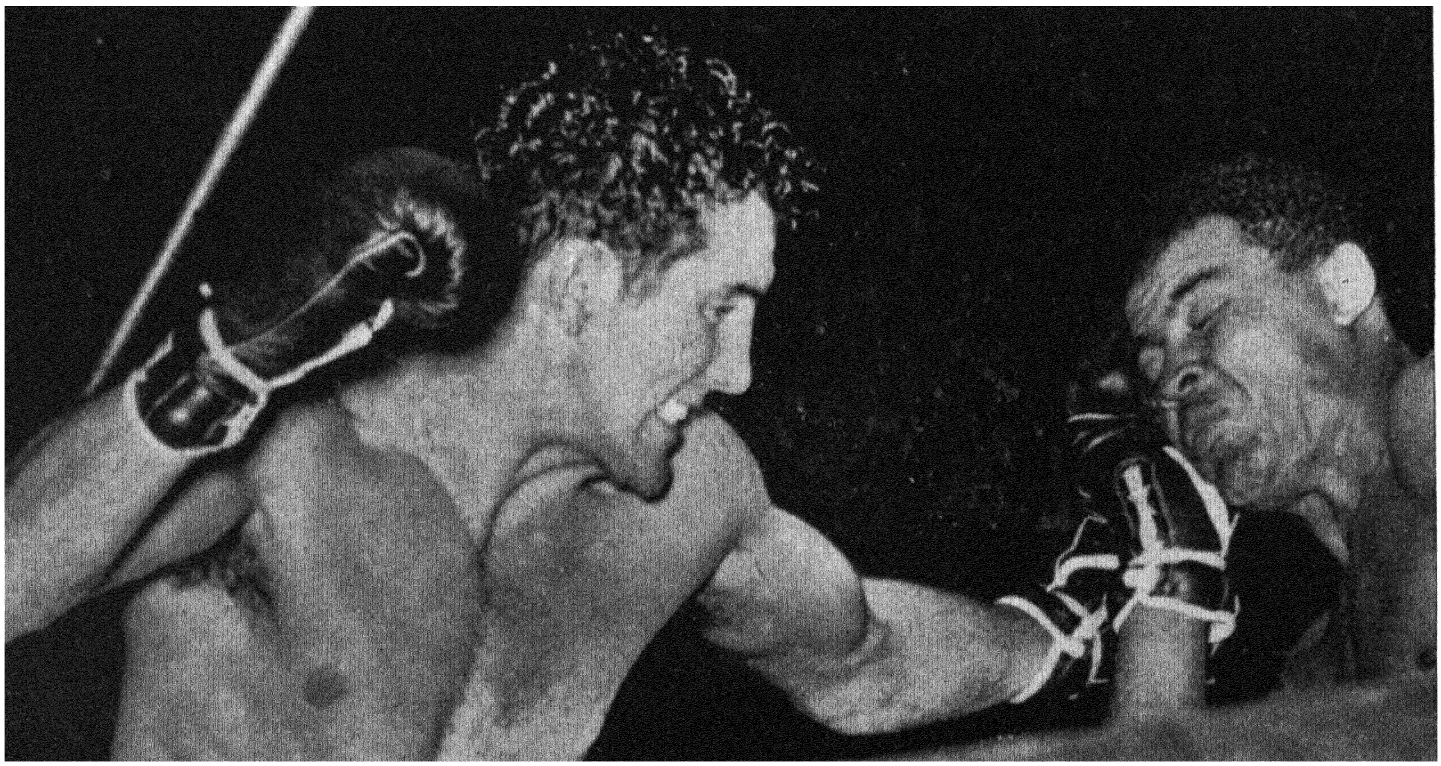
Strangely, the greatest danger came to Louis from two opponents who were appraised as among his least dangerous rivals. Jacob Baer, Jr., known as Buddy Baer in boxing, a California 250-pounder, bowled Louis out of the ring in the first round of their battle in Washington, D.C., May 23, with a ponderous right-hand punch. Louis clambered back into the ring to save his title, and proceeded to subject Baer to such a terrific beating the Californian did not respond to the bell for the seventh round. The result went as a seven-round knockout, since the sixth round had been completed.

On June 18 Louis again faced eclipse when for 12 rounds of a scheduled 15-round bout at the Polo Grounds, New York city, Conn outboxed the champion and closed the 12th round by flooring Louis with a left hook to the jaw. But the experience only maddened Louis, who threw all his fury into a 13th round in which he knocked out Conn.

At the Polo Grounds, too, on Sept. 29, Louis knocked out Nova in six dull rounds before the largest crowd of the season. There were 56,549 persons who saw the contest, paying the year's largest receipts, $583,821. A crowd of 54,484 persons saw the Conn bout in June, paying receipts of $451,743.

Louis knocked out Clarence (Red) Burman in five rounds, Jan. 31, 1941, in his first bout of the year. He followed this with a two-round knockout of Gus Dorazio in Philadelphia, Pa., Feb. 17. On March 21 he knocked out Abe Simon in 13 rounds at Detroit, Mich., and on April 8 Louis knocked out Tony Musto in nine rounds in St. Louis, Mo. The Baer bout followed this one, and was followed by the contests against Conn and Nova.

Rival claims to the light-heavyweight title were set up when Conn voluntarily surrendered the crown in order to get the Louis bout. The dispute was settled Aug. 26 when Gus Lesnevich, Cliffside Park, N.J., defeated Tami Mauriello, of New York city, in a 15-round bout. Mauriello, who had disputed Lesnevich's title claim, suffered a duplicate beating on Nov. 14 in a return bout. In the middleweight class the abdication of Billy Soose, of Farrell, Pa., engendered confusing title claims which were settled only when Tony Zale, Gary, Ind., who had recognition as National Boxing association champion, conquered Georgie Abrams, of the U.S. navy, on Nov. 28. On July 29 Freddie (Red) Cochrane, of Newark, N.J., defeated Fritzie Zivic, Pittsburgh, Pa., to win the world welterweight championship in the biggest boxing upset of the year. Shortly after the bout Cochrane



JOE LOUIS was near defeat in his fight with Billy Conn June 18, 1941 at New York city, but the champion rallied to knock out the challenger in the 13th round

enlisted in the navy. Lew Jenkins, Sweetwater, Tex., lost his lightweight championship claims, which had been recognized in New York, when Sammy Angott of Washington, Pa., defeated him Dec. 19 in a 15-round bout held in Madison Square Garden, New York city. Angott, who had been recognized as National Boxing association champion, thereby gained undisputed right to the title. Chalky Wright, Los Angeles, Calif., and Jackie Wilson of Pittsburgh, Pa., disputed the world featherweight championship as the year ended, Wright being recognized by the New York State Athletic commission, while the National Boxing association recognized Wilson. Lou Salica of New York city three times defended his world bantamweight title, his victims being Tommy Forte, Philadelphia, Pa. (twice), and Lou Transparenti, Baltimore, Md.

Amateur Boxing.—Boxing under the auspices of the Amateur Athletic union and among college teams attracted wide popularity, although competition was on a modified scale in college circles. Cornell dropped boxing as an intercollegiate sport, although favouring expansion on an intramural basis, and Annapolis considered dropping the intercollegiate scale, too. Syracuse university won the Eastern Intercollegiate association championships. The Eastern Intercollegiate conference championships were cancelled. The University of Idaho captured the National Collegiate Athletic association championships and produced three individual champions.

(J. P. D.)

Boys' Clubs of America, Inc.

Boys' Clubs of America, Inc., is a federation of 352 organizations functioning in 197 cities, which provide leisure-time activities under trained leadership for nearly 300,000 boys between the ages of 7 and 18. They are found chiefly in the congested high-delinquency districts of urban communities. Boys' clubs are non-sectarian organizations and welcome boys of all classes and creeds. Each organization within the membership of the Boys' Clubs of America is completely autonomous, but looks to the national organization for the stimulation and promotion of the Boys' Club movement, and program, personnel and finance services which would be difficult, if not impossible, to secure if left to the individual units.

Boys' Clubs of America, Inc., was organized in Boston, Mass., on May 19, 1906. Its control is vested in a board of directors who are elected by vote of the representatives of the member organizations. Specific responsibilities are delegated to a professional staff and to an executive committee. The officers are Herbert Hoover, chairman of the board; William Edwin Hall, president; Albert H. Wiggin, treasurer; William Ziegler, Jr., secretary. The headquarters are at 381 Fourth avenue, New York city. The budget for the year 1940 was approximately $170,000.

Boy Scouts.

On Feb. 8, 1941, the Boy Scouts of America celebrated its 31st anniversary, on which date Franklin D. Roosevelt, president of the United States and honorary president of the Boy Scouts of America, delivered a challenging message to the nation over a nation-wide broadcast.

The theme of the 31st national council meeting, held at the Willard hotel, Washington, D.C., from May 16 to 17, was "Physically Strong, Mentally Awake and Morally Straight." Members attended from all parts of the U.S.

The program for strengthening and invigorating democracy, organized and launched in 1940, was further emphasized during 1941 and Scouts took active part in the defense program of the U.S. government. Troops took inventory of membership, equipment and training on a nation-wide scale in order to be in a position to measure their readiness to serve the government.

The first call for Scout service was received from the president of the United States on April 26, 1941, requesting that Boy Scouts lend their aid to the secretary of the treasury as special messengers in the distribution of the official government posters. Scouts all over the country responded enthusiastically to this emergency call and a total of 1,607,500 posters were distributed.

On July 24 a second nation-wide service project was performed by the Boy Scouts of America, in co-operation with federal, state and local officials and other volunteer agencies. This project was the collection of aluminum. Again Scouts rallied to an emergency call and more than 10,000,000 lb. of aluminum were collected.

Other activities in relation to the unlimited emergency in the national defense program in which Scouts took part were: Organization of emergency service corps, patriotic mobilization as a demonstration of national unity, blackout demonstrations and manoeuvre participation, defense housing survey, United Service Organizations campaign participation, baseball defense bond day, civilian defense volunteer offices, inter-American good-will participation, national book campaign, consumers' pledge distribution, participation in civilian defense week, national salvage campaign. During 1941 there was an increase in membership of 5.7%. There were 2,162,570 persons on the rolls of the Boy Scouts of America during 1941. There was a total of 50,739 troops and packs. Since 1910, 10,183,743 persons have been members of the organization (Dec. 31, 1941).

BOY SCOUTS of Madison, Wis. and of many other U.S. cities made house to-house canvasses for used aluminum in the summer of 1941 to bolster the nation's supply of this strategic metal

Great Britain.—After the death of Lord Baden-Powell (*q.v.*) on Jan. 8, 1941, in Kenya, British East Africa, Lord Hampton became Chief Scout of the British Boy Scouts association.

Scouts performed more than 180 different kinds of service jobs. More than 60,000 boys have been awarded the National Service badge for sustained work as A.R.P. messengers, first-aid orderlies, telephonists, signallers, stretcher bearers, instructors to the home guard, assistants in rest centres. Many of these service jobs were dull, routine tasks, others meant long periods on duty waiting for the emergency and being prepared to meet it when it came. The Scout fitted himself for these emergencies by training. He learned how to fight fire, how to act if an attack is made with poison gas, how to deal with panic. He attained skill in first aid, in relaying verbal messages, in signalling and in a thorough knowledge of his own district. Many lives were saved by Scouts during air raids. (J. E. W.)

Brandeis, Louis Dembitz

(1856–1941), U.S. jurist, was born in Louisville, Ky., Nov. 13. Educated in elementary schools in Germany and the United States, he was graduated from Harvard law school in 1877 and practised in Boston from 1879 to 1916. Young Brandeis started as a corporation lawyer, but swung toward economic liberalism and won a reputation in the years between 1907 and 1916 as a crusader "for the people" and as an active foe of big business monopoly. In Jan. 1916, he was appointed by President Wilson as associate justice of the supreme court, being the first Jew to attain this position. Justice Brandeis established a record as a militant liberal in the high court, and his name was frequently linked with that of Oliver Wendell Holmes in dissenting opinions. He upheld the minimum wage law for women and was the author of a frequently cited majority opinion in which he defended labour's right to picket but not to intimidate.

Of 16 major New Deal laws which were brought before the supreme court, Justice Brandeis sided with the administration in 10 instances, but in 1935 he voted against the National Recovery act, which aroused his dislike for "bigness." He resigned from the

court in Feb. 1939 because of age and failing health and resumed an active role in the Zionist movement in an effort to relieve the plight of Jewish refugees from Germany. He died in Washington, D.C., Oct. 5. (See *Encyclopædia Britannica.*)

Brauchitsch, Walther von (1881–), German general, was born in Berlin on Oct. 4, the son of a general of cavalry, and was educated in the German capital. He entered a military academy and became a lieutenant in 1900. In 1912 he became an officer of the German general staff and he served in this position during World War I. He was appointed inspector of artillery in 1932, and the following year he succeeded Marshal von Blomberg as commander of the East Prussian army district, which in 1935 was transformed into the 1st army corps. In 1937 he became commander of the 4th army group, and in Feb. 1938, after the "army purge," he succeeded Gen. von Fritsch as commander in chief of the German army. He personally directed the campaigns in Poland, the Netherlands, Belgium and France. For his military services to the reich he was singled out for mention by Adolf Hitler on July 19, 1940, and, with 11 other generals, was raised to the rank of field marshal.

In 1941 Brauchitsch supervised German operations in the Balkans and Crete, in northern Africa and in the U.S.S.R. When his armies in the east slowed down, wavered and finally turned backward, Hitler announced on Dec. 21, 1941, that he had removed Brauchitsch as commander in chief as of Dec. 19 and, answering an "inner call," had taken over that position himself.

Brazil. A republic in eastern South America and largest independent country in the western hemisphere; language: Portuguese; religion: overwhelmingly Roman Catholic; capital: Rio de Janeiro (pop. 1,781,567); president in 1941: Dr. Getúlio Vargas.

Area and Population.—The area is 3,291,416 sq.mi., 7·5% more than that of continental United States. The boundary approximates 23,648 km. in length and touches every South American country except Chile. The population was officially estimated at 45,002,176 on Dec. 31, 1939. Preliminary reports on the comprehensive census taken Sept. 11, 1940 (published late in 1941), however, showed a total population of only 41,356,605, distributed by states as follows: Alagoas, 957,621; Amazonas, 449,077; Bahia, 3,907,086; Ceará, 1,994,000; Espirito Santo, 758,425; Goyaz, 882,865; Maranhão, 1,246,813; Matto Grosso, 427,629; Minas Geraes, 6,797,219; Pará, 949,808; Parahyba, 1,424,457; Paraná, 1,243,838; Pernambuco, 2,674,683; Piauhy, 832,250; Rio de Janeiro, 1,861,727; Rio Grande do Norte, 774,503; Rio Grande do Sul, 3,336,632; Santa Catharina, 1,182,854; São Paulo, 7,230,163; Sergipe, 541,945; Acre (territory), 81,326; federal district (*i.e.*, Rio de Janeiro city), 1,781,567. No census reports on individual cities have been made; the chief cities (with 1939 official pop. est.) are: São Paulo, 1,322,643; Recife (Pernambuco), 550,389; São Salvador (Bahia), 388,183; Porto Alegre, 385,389; Belém (Pará), 318,341; Bello-Horizonte, 217,218; Santos, 203,126. In 1941 unofficial sources estimated the approximate racial distribution to be: whites, 32·7% (including 8·9% chiefly Italian and 2·6% chiefly German stock); Negroes and mulattoes, 37·2% (full-blooded Negroes 5% to 12%); Indians and mestizos (pure Indians 2·2%), 17·7%; orientals, 0·7%. The Negro and mulatto population predominates in the north; the southern states are largely white. The German elements are concentrated in the south, particularly in Santa Catharina, Paraná and Rio Grande do Sul states.

An average of about 20,000 permanent immigrants were entering the country annually until 1941 (1939, 22,668; 1940, 21,259). To check further increase in the European-born population, and especially a threatened large influx of refugees, a sweeping decree-law was issued March 19, 1941. Under it, immigration was restricted to nationals of American countries, except for agricultural workers, skilled technicians and those bringing at least 400 contos ($20,000) of capital.

History.—Brazil's history in 1941 was featured by foreign relations, with a marked trend toward increasingly close political and economic ties with the Americas. Improvement of defenses, repression of axis propaganda and other activities, reorientation of the national economy toward greater economic interdependence of the Americas and development of a more diversified production were the dominant factors.

Of particular consequence to Brazil was the continued shortage in shipping facilities. (*See* below, under *Communication.*)

Development of transportation by air was coupled closely with defense preparations. Direct communication with continental Europe ceased in December when the Italian "LATI" air service between Italy and Brazil (via Dakar), long a carrier of axis-destined mica, crystal, diamonds and other minerals of great importance for war needs, was discontinued as a result of the refusal of United States-controlled oil companies to supply fuel. Subsequently, its charter was cancelled by the Brazilian government. At the same time, the German Condor lines operating within Brazil were forced to quit. Internal and external air transportation was relieved, however, by corresponding expansion of the Panair do Brasil, a Pan American Airways subsidiary. Especially significant was the permission granted Panair to improve and construct landing fields in the strategic Natal area 1,600 mi. from axis-controlled Dakar (*q.v.*) in West Africa. In recognition of the increased importance of the Natal region, Brazil extended the service period of its military there.

Relations with the axis powers were strained on several occasions during the year. In March vigorous protest was made to Germany over the bombing of a Brazilian ship in the Mediterranean. The ever-present problem of a large, only partly assimilated German population in the south continued to hinder Brazil's nationalistic program. In October a German "sport society" in Santa Catharina was closed for giving instruction in German. In the same month a pro-nazi newspaper, although printed in Portuguese, was suppressed for slurring the Portuguese language and "preaching racism and sedition." Earlier in the year a presidential decree gave all foreign language publications six months to terminate. This order affected some 50 periodicals, including 15 German, 9 Italian, 8 Japanese, 5 English, 5 Syrian, 4 Spanish.

Fear of pro-axis revolutionary activity was heightened during the year, especially after disclosures in Argentina in September revealed the existence of a widespread revolutionary organization there with many "cells" in Brazil, which—it was charged—were planning invasion of Argentina from southern Brazil (*see* also ARGENTINA).

Pres. Vargas and other high officials frequently emphasized Brazil's co-operation in furtherance of American solidarity. The Havana conference pacts of July 1940 were formally ratified in March, and relations with the United States were especially close. A number of Brazilian army officers were sent to the United States for special training, and United States aid in military supplies and installations was accorded by a "lend-lease" agreement of Oct. 1. Under it, in return for credits estimated at between $90,000,000 and $110,000,000, Brazil, on its part, undertook to guarantee to supply the United States with certain strategic materials, notably minerals.

Co-operating with the United States in hemisphere defense, in June Brazil backed a United States declaration to Portugal that the Azores and other Portuguese Atlantic islands must remain in

friendly hands. Formal and active support was given in November to United States defense measures in Surinam (*q.v.*). Garrisons on the Surinam border were strengthened, and a military mission was sent to Paramaribo to co-operate with the Netherlands and the United States in the defense of the colony.

The only irritant of consequence to friendly U.S.-Brazilian relations arose from the publication in July of a United States blacklist of axis-controlled firms in Latin America. Designed to throttle pro-axis economic activities in Hispanic America, the hastily drawn initial list included the names of several influential Brazilians. Enforcement was complicated, furthermore, by Brazilian laws penalizing refusal to sell goods. Subsequent modification of the blacklists alleviated the friction.

Upon the entry of the United States into active war in December, Brazil moved closely with the United States. The press indignantly condemned Japanese methods at Pearl Harbor. The government officially reiterated its support of continental solidarity. Official support was given also to the policy initiated by Uruguay, under which the United States and other American nations at war were regarded as nonbelligerents and therefore entitled to full access to Brazilian ports and airfields. More than $100,000,000 of non-American bank deposits were frozen by executive decree. In addition, registration was denied the German D.N.B., and the nazi Transoceanic and Italian Stefani news agencies were placed under special censorship. The National Press council forbad criticism of the policies of any American nation. At the same time, extra police precautions against disorders were taken to avoid violence in many areas, especially São Paulo, centre of a large Japanese population.

As the year closed, Brazil prepared to play host to a meeting of American foreign ministers scheduled for Jan. 15, 1942, in Rio de Janeiro to consider the practical application of the Havana pacts under the new war conditions.

Under war conditions, Brazil, in 1941, further stressed its long-established policy of cultivating close economic, political and cultural relations with its more immediate neighbours. Several commercial and cultural conventions were signed with Paraguay in June. Among the more important provisions were those making Santos a free port and providing for improved communications between that city and Concepción, Paraguay. A treaty signed with Chile in November marked another step toward greater economic interdependence. Political and economic relations with Canada were strengthened with the exchange of diplomatic representatives and, following the visit in October of a Canadian economic commission, an exploratory trade agreement was signed. In the same month, Brazil and Colombia signed a cultural accord facilitating student exchange.

Of tragic consequence in 1941 were severe floods in the southern state of Rio Grande do Sul—the worst since 1876. Porto Alegre suffered especially, where public utilities were entirely wiped out. Some 60,000 were left homeless within the state, and the large rice crop was all but destroyed. The total property loss was estimated at $5,000,000.

More cheerful was the continued social advance in 1941. On May 1, Pres. Vargas formally inaugurated the labour courts provided for by the constitution of 1937. A decree in September forbad labour of children under 14 and restricted labour between 14 and 18 according to family need.

Education.—In 1937, there were 2,662,243 in primary schools, approximately 300,000 in secondary, normal and technical institutions and 25,441 in universities and colleges. Education accounted for 8.42% of all public expenditures in 1940.

Defense.—Brazil had a standing army of 88,548 in 1941 and a trained reserve officially estimated in excess of 250,000, a fourth of which was state militia. Military service is compulsory. The navy in 1941 had 2 old battleships, 2 cruisers, 16 destroyers and 4 submarines. Nine destroyers were building. The air force had 100 planes and 3,500 officers and men.

Finance.—The monetary unit is the milreis (value in 1941: 5 cents to 6 cents, U.S.), ordinarily expressed in contos of 1,000 milreis each. Improved finances permitted the liquidation, in 1941, of a $19,200,000 loan made in 1937. By decree of April 1941, all banks of deposit were nationalized, but in November modifications were permitted in favour of American corporations.

Foreign Trade.—In 1940, exports totalled 4,966,158 contos, a decline of 11.5% from 1939; imports were 4,964,149 contos, a decline of 0.4%. The chief exports, coffee (32.11%), cotton (16.9%), fresh and canned meats (9.3%), hides and skins (4.5%) and cacao (3.9%), except for meats, declined. Meats, carnauba wax (3.4%), castor oil (2.4%), precious stones, largely diamonds (2.0%), and vegetable oils (1.9%) registered increases. Leading imports were machinery and apparatus (15.0%), wheat (9.5%), iron and steel manufactures (8.9%), automobiles (6.3%), coal, coke, etc. (5.8%), chemicals and pharmaceuticals (5.6%).

In 1940, the United States continued to be Brazil's best customer, taking 42.3% of its exports (1939, 36.2%), followed by Great Britain 17.3% (1939, 9.6%), Argentina 7.2% (5.5%), Japan 5.7% (5.5%), China 3.1% (3.0%), Canada 2.1% (0.3%), Uruguay 1.5% (1.0%), Portugal 1.3% (0.6%), Spain 1.1% (0.3%), Chile 0.77% (0.4%). By 1940 the war had virtually eliminated Germany (1939, 12%), France (6.3%), and other continental European countries.

The United States dominated Brazil's imports in 1940, supplying 51.9% (1939, 33.6%). Argentina, with 10.8% (1939, 8.4%), rose to second place over Germany and Great Britain. Other leading suppliers were Great Britain 9.4% (9.3%), Curaçao 4.7% (3.4%), Japan 2.4% (1.5%), Canada 1.9% (1.5%), Portugal 1.6% (1.8%), British India 1.4% (1.1%). Former major exporters to Brazil who were eliminated in 1940 included Germany (1939, 19.2%), Belgium and Luxembourg (4.2%), France (2.8%), Sweden (2.3%), Italy (1.8%).

Foreign trade with other South American countries rose sharply in 1940, with exports 10.3% (1939, 7.2%), largely to Argentina (7.2%) and Uruguay (1.5%), and imports 15% (1939, 10.3%), with Argentina supplying 10.8%, Uruguay 1.2% and Peru 1.1%.

Despite further restriction of markets, curtailment of transportation facilities, and threatened, if not actual, lack of raw materials, Brazilian trade rose through the first ten months of 1941, when a favourable balance approximated $50,000,000 in contrast to a $200,000 deficit for the same period of 1940. The improvement resulted from increased prices, large shipments of cotton to Japan, China and Canada and a heavy demand for a variety of minor export commodities, including manganese, iron ore, mica, quartz crystals, carnauba wax, castor seed and industrial diamonds. In the first eight months of 1941, exports increased 41% to $223,237,000, while imports declined 6.4% to $169,161,000. The United States took 52% of the exports during this period and furnished 58% of the imports. Great Britain purchased 13.5%, but its sales were only nominal. In the first ten months of 1941, Germany and Italy, who together in 1938 had supplied 28% of Brazil's imports and taken 21% of its exports, furnished 3% of all imports and purchased 2% of all exports.

Communication.—Brazil's external communications, ordinarily good, suffered from wartime conditions in 1941. Lack of bottoms, already acute, was further threatened through the withdrawal of Japanese vessels and abandonment of the principal United States regular shipping services. The situation was improved in November, however, with the purchase of eight Italian ships (46,000 tons) tied up in Brazilian ports.

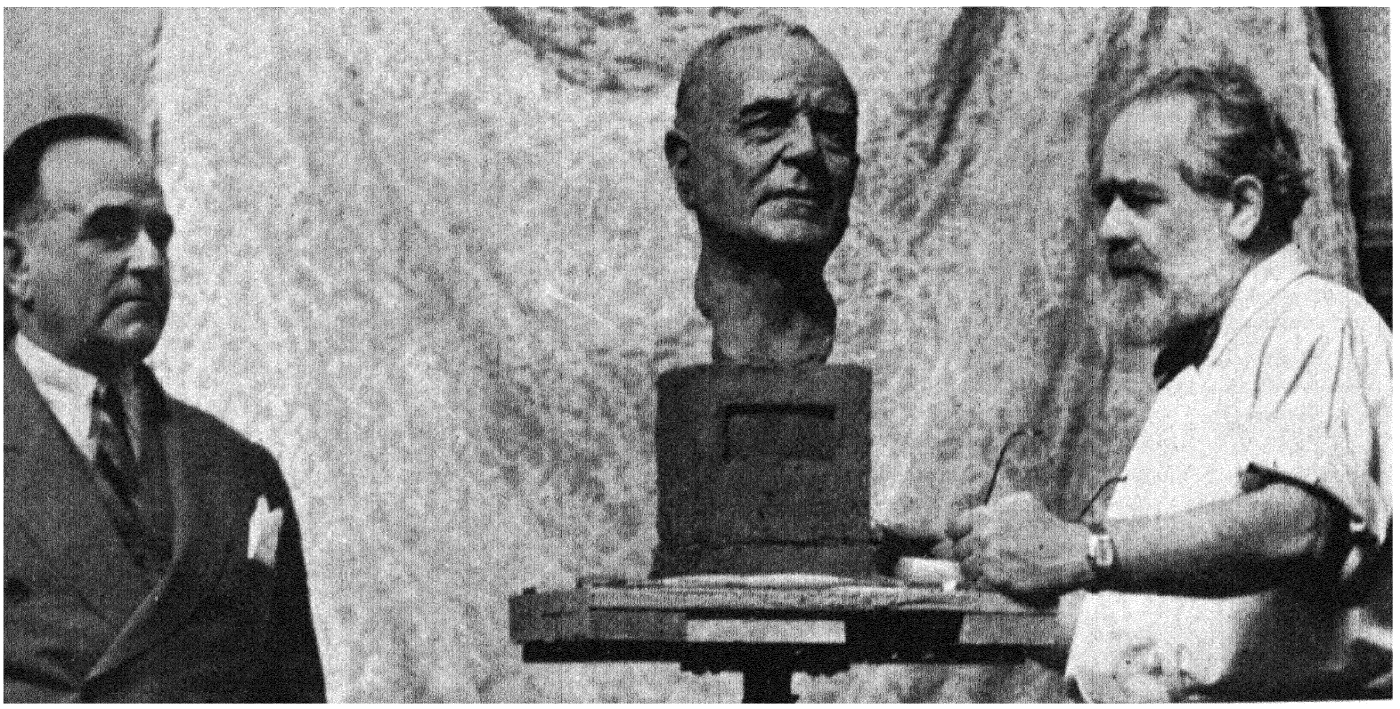
Through most of 1941, the Italian "LATI" air line maintained service from Italy, via Dakar, to Brazil and thence to Buenos Aires and Chile, but was discontinued in December (*see* above). Pan American Airways expanded its service, including that of its subsidiary, Panair do Brasil, which took over the domestic routes of the German Condor line.

Creation of an air ministry, with jurisdiction over both civil and military aviation, in Jan. 1941, marked the culmination of a decade of aviation development in Brazil. Aviation statistics as of 1940 showed 512 landing fields (1930, 31), 7,900 regular scheduled flights (1930, 1,780), 4,337,300 flown miles (1930, 673,735 mi.), 70,734 passengers carried (1930, 4,567), 999,894 kg. of express carried (1930, 23,864 kg.).

Railway and highway communications are inadequate, with the Amazon basin depending almost entirely on waterways. In 1941 Brazil had 21,750 mi. of railways in operation, and about 600 mi. under construction, including an extension of the Central railway of Brazil to tap important iron and manganese deposits, and lines to the Paraguayan and Bolivian frontiers. The last was planned as part of an eventual transcontinental railway from Santos to the Pacific at Arica, Chile.

In 1941 there were about 140,000 mi. of highway in Brazil, most of it unsurfaced.

Agriculture.—Brazil is primarily an agricultural country, with one state, São Paulo, producing 40% of the national farm wealth. Coffee, the chief export crop, ordinarily provides half of the world's production, but accounted for only 32% of 1940 exports against more than 70% in 1930. The 1941–42 crop, owing to drought conditions, was estimated to be the smallest in many years. Under government policy and control, a sacrifice quota of 35% was purchased by the government for destruction or for use in the manufacture of caffelite, a plastic, leaving available some 12,000,000 bags of the 1941–42 crop against 20,850,000 bags in 1940–41. Under the inter-American coffee quota, Brazil was originally allotted 9,715,338 bags of 132 lb. for export to the United States in the year ending Sept. 30, 1941, with an additional export allotment of 7,813,000 bags for other countries (*i.e.*, including continental Europe). The United States quota was altered several times during 1941, in order to check sharply advancing prices, and the 1941–42 quota was placed at 10,317,904 bags, a 10.945% increase. Brazil's proportion was thus approximately 57.5%. Cotton, Brazil's second crop, accounted for 16.9% of all export values in 1940. The 1940–41 northern crop was officially estimated at 146,700 metric tons, the southern crop 360,000 to 400,000 tons. About 25% is for domestic consumption. Exports for the first eight months of 1941 were 222,244 tons, valued at 758,158 contos, against 146,126 tons of 575,735 contos value in the corresponding period of 1940. Japan, Canada, United States and China were the principal purchasers. Scarcity of bottoms and the spread of World War II to the far east, however, darkened the outlook for continued improvement.



PRESIDENT GETULIO VARGAS of Brazil sitting for U.S. sculptor Jo Davidson in 1941. Davidson was also commissioned to do the heads of the other South American presidents, as part of the U.S. goodwill program

Corn is important for domestic consumption. The 1939 production was 5,405 tons. Other important agricultural products include rice, sugar, oranges, beans and manioc. Forest products, mostly semi-cultivated, include yerba maté (Paraguay tea), carnauba wax (1939 export, 8,653 tons), castor seed (1940, 117,000 tons), oiticica oil (1940, 7,235 tons), a substitute for tung oil. War demands greatly increased both the unit value and volume of Brazilian vegetable waxes and oils. The babassu palm nut, whose oil is used as a combustible, was being developed in 1941 as a gasoline substitute.

Brazil is the natural home of the rubber plant, but lost its market to the plantation rubber of the East Indies. A revival was being furthered, however, in 1941 and the United States rushed, by air, two shipments of seed for experimental purposes. Brazilian forests, it is estimated, contain 5,000,000,000,000 ft. of hardwoods.

The livestock industry provides frozen meats, hides and skins for export. In 1938 there were 41,883,374 cattle, 23,542,966 hogs, 14,167,450 sheep, 6,712,710 horses, 5,905,581 goats, 4,119,273 mules.

Manufacturing.—Brazilian manufacturing received its start in World War I, and under World War II received a further great stimulus. Total industrial production in 1940 was valued at 25,145,000 contos, an increase of 25.77% over 1938. The leading manufactures in 1940 (with percentage of increase over 1938) were: foodstuffs, 8,490,000 contos (23.3%); textiles, 5,708,000 contos (14.3%); chemicals and pharmaceuticals, 1,886,000 contos (24.1%); metal manufactures, 1,595,000 contos (38.9%); furniture and woodwork, 1,230,000 contos (37.1%); paper, 769,000 contos (48.5%). Plans for a Brazilian steel industry continued, with a large steel plant under construction.

Mineral Production.—Brazil is rich in minerals and war demands provided attractive markets, but the industry is handicapped by lack of adequate transportation facilities. There are extensive coal deposits in the southern states of Rio Grande do Sul and Santa Catharina but they are of poor quality, with 1,336,301 tons produced in 1940; by law, this coal must be consumed in mixture with imported coal. Brazil possesses about 22% of the world's iron supply; 185,548 tons of pig iron were produced in 1940. Manganese production totalled 270,000 tons in 1940.

War encouraged the exploitation of heretofore minor minerals. These and their 1940 export figures are: diamonds (254 kg.), rock crystal (1,103 tons), mica (1,117 tons). Potential petroleum deposits were under development in 1941 in northern Brazil, especially in the state of Bahia, and a railroad was being pushed west to tap Bolivian resources. In 1940 Brazil produced 697,800 tons of cement and in 1941 was virtually self-sufficient in that product.

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(L. W. BE.; J. S. CU.)

Bread and Bakery Products.

The most important development in the U.S. and British baking industries was the production of white breads containing vitamins and minerals natural to whole wheat. In the U.S. this nutritionally improved white loaf was known legally as "enriched bread." It became generally available in May 1941, and by the end of the year comprised somewhat more than one-third of all bread produced in the U.S.A.

Enriched bread has added thiamin (vitamin B_1), the pellagra-preventive vitamin known as nicotinic acid or niamin, and iron. The amounts of these added nutrients in the U.S.A. were those recommended by the National Research council, but official federal standards for this product were to be issued early in 1942, as a result of hearings held before the Federal Food and Drug administration in Aug. 1941.

The nutritional enrichment of white bread may be accomplished in several ways. One is by the use of enriched flour, for which federal standards were promulgated in 1941, to take effect on Jan. 1, 1942. Another method is by the use of enriched yeast, and a third by the direct addition of the vitamins and iron to the dough.

Through the customary use of dry milk solids, this white bread also contains riboflavin (vitamin B_2) and calcium. Riboflavin was designated officially as a required ingredient of enriched flour after July 1, 1942, and would also be required in enriched bread.

Since more than 95% of the bread consumed in the U.S. is white bread, the enrichment program was regarded as a significant contribution to improved national nutrition.

The biennial census of manufactures of the U.S. department of commerce showed that in 1939 there were 18,043 establishments making bread and other bakery products. These employed 201,533 wage earners, who were paid $262,001,562. The cost of materials was $567,427,173, and the total value of products amounted to $1,211,023,755. Of the entire number of baking establishments, 2,569 were wholesale only, 8,978 were retail only and 6,496 were both wholesale and retail. (*See* also FLOUR AND FLOUR MILLING.)

(J. A. TO.)

Brett, George Howard

(1886–), U.S. army officer, was born Feb. 7 in Cleveland, O. A graduate of Virginia Military institute in 1909, he was a major during World War I, retiring from active service in 1920. He later returned to the army, specialized in military aviation, and won his rating as a command pilot. In Oct. 1940, he was promoted to the rank of major general. Prior to U.S. entry into World War II, Gen. Brett visited the middle east and Britain to co-ordinate British and U.S. aircraft production. After Japan attacked U.S. Pacific possessions, Gen. Brett, British General Wavell (*q.v.*) and Generalissimo Chiang Kai-shek (*q.v.*) set up a military council in Chungking for common prosecution of the war against Nippon. On Jan. 3, 1942, when President Roosevelt and Prime Minister Churchill made Gen. Wavell supreme commander of Allied forces in the far east, Gen. Brett was appointed deputy supreme commander for the region.

Brewing and Beer. The generic word beer covers the malt beverage group including beer, ale, porter, etc. In 1941 the product was manufactured in 39 states and sold in the U.S. in all of the states under regulation and licence. It is taxed by the federal and state governments, and in scattered cases local taxes are imposed. Aside from taxation, control is vested in the states, which generally treat beer distinctly from liquors because of its low alcoholic content.

The industry's production and sales statistics are based on United States internal revenue reports of tax-paid withdrawals (sales) based on the United States fiscal years ending June 30. As cited here, the reports cover the period since beer's re-legalization by act of congress effective April 7, 1933 (which preceded the effective date of repeal of the prohibition amendment by 8 months). On Dec. 31, 1941, there were 510 breweries in the U.S. as compared with the peak of 750 in 1935.

Sales Records.—Following are the sales records in United States barrels (31 gal.) by fiscal years ending June 30th: 1933 (85 days) 6,277,728; 1934, 32,266,039; 1935, 42,228,831; 1936, 48,759,840; 1937, 55,391,960; 1938, 53,926,018; 1939, 51,816,874; 1940, 53,014,230; 1941, 52,289,348.

Monthly federal reports, subject to minor corrections after final audit, show tax-paid withdrawals for the six months July-Dec. 1941 totalling 31,388,000 barrels. This marks a decided increase and gives an estimated barrelage of 57,000,000 for the calendar year 1941. Per capita consumption was 13·5 gal. in the calendar year 1941 as compared with 12·5 gal. in the calendar year 1940.

Industry features of the calendar year 1941 included: Sales increases of 5,200,000 bbl. over 1940 as the national income increased; payment during the full year of the additional emergency tax of $1 per barrel for national defense (total federal tax $6 per barrel); industry activities to "clean up or close up" law-violating retail outlets and expansion of this program to include areas around the army camps throughout the United States.

Law Observance.—The industry's nation-wide program, being conducted through the United Brewers Industrial foundation, with committees of brewers and beer distributors applying it intensively in 14 states, worked directly with retailers and the public authorities to protect the good repute of beer and brewing from abuse by a minority of law violators. These committees reported more than 40,000 inspections of retail outlets to the end of 1941, and about 4,800 warnings resulting in more than 2,000 voluntary corrections of improper conditions and another 2,000 licence revocations and other legal actions.

In addition, an "army camp area" program covered 35 of the 37 states in which there were large concentrations of troops in training, including 12 of the 14 states mentioned above. This program for camp and training areas, directed by the foundation, brought co-operative effort of brewers, wholesalers, retailers and their associations to work with military and civil authorities for the maintenance of wholesome conditions where beer is sold. Light beer was sold on military reservations and its availability was commended by Secretary Stimson and other ranking officials as an aid to morale and temperance for troops in training.

Market Conditions.—Package sales, considered significant of increased home use, continued to gain in 1941 when 56% of all beer was sold in bottles or cans. In 1934 the percentage was 25% package against 75% draught.

Taxes.—Federal excise and special taxes on beer for the fiscal year 1941 totalled $322,706,232. Cumulative federal taxes since re-legalization totalled $2,077,408,188. State and local taxes for that period are estimated at $825,000,000, bringing the combined public revenue from beer to approximately $2,902,000,000 for the period from April 7, 1933, to June 30, 1941. A substantial part of this revenue went for national defense and the balance for other public purposes. During 1941 a number of states waived state taxes on beer sold in military reservations.

War Conditions.—In addition to contributing to the war effort through payment of enormous taxes, aiding morale and in other ways, the beer industry used surplus farm crops not required for defense purposes and was virtually noncompetitive with any defense activities. It required no imported raw materials and the export of beer and ale exceeded the imported finished product. Because of the war, world production and consumption reports for this industry were no longer available. (H. Hy.)

Brick. Total shipments of all types of brick were somewhat less in 1940 than in 1939, due mainly to low shipments in the first quarter of the year. No specific figures were available for the year, but from preliminary data it was estimated that common brick declined 3%, face brick 12%, vitrified brick 18%, and hollow tile 11%, but the first half of 1941 gave indications of marked improvement, especially in common and face brick. (G. A. Ro.)

Brick Production in the United States
(In millions)

Type of Brick	1936	1937	1938	1939
Common	2,966.5	3,252.6	2 729.9	4,725.9
Face	848.8	937.6	803.1	
Hollow	?	?	?	58.8
Glazed	?	?	?	194.0
Vitrified	88.9	90.2	94.1	61.1
Sand-lime	103.2	138.3	95.0	153.3
Fireclay	626.6	728.4	365.2	525.0
Silica	229.3	220.1	91.0	175.4
Magnesite and Chromite	20.4	22.8	12.1	21.5

Bridge, Contract: *see* CONTRACT BRIDGE.

Bridges, Robert (1858–1941), U.S. editor, literary critic and journalist, contributed to many American magazines under the pen name of "Droch." Born July 13 in Shippensburg, Pa., he was graduated from Princeton, where he was a classmate of Woodrow Wilson. He was assistant editor of the *New York Evening Post*, 1881–87, and then went to *Scribner's* magazine, where he served in a similar post. He was editor of *Scribner's* from 1914 until his retirement in 1930. He died Sept. 2 at his home in Shippensburg.

Bridges. The world's longest spans of the various types in 1941 are listed in the table.

The collapse on Nov. 7, 1940, of the Tacoma Narrows bridge with a main span of 2,800 ft. (the third longest span in the world) directed concentrated study to the problems of aerodynamic oscillations of bridges. The insurance claims were settled for $4,000,000, and plans were being made for rebuilding the bridge.

The world's longest double-leaf bascule span (*see* table) at Sault Ste. Marie, Mich., collapsed on Oct. 7, 1941, dropping a locomotive into the canal below, with the loss of two lives. The

World's Longest Spans

Type	Bridge	Location	Year	Span
Cable Suspension	Golden Gate	San Francisco	1937	4,200 ft.
Eyebar Suspension	Florianopolis	Brazil	1926	1,114
Cantilever	Quebec	Canada	1917	1,800
Steel Arch	Kill van Kull	New York	1931	1,652
Continuous Truss	Duisburg	Germany	1935	839
Wichert Truss	Homestead	Pittsburgh	1937	533½
Continuous Girder	Mangfall	Germany	1935	354
Simple Truss	Metropolis	Ohio river	1916	720
Concrete Arch	Esla	Spain	1940	645
Vertical Lift	Cape Cod canal	Massachusetts	1935	544
Swing Span	Fort Madison	Mississippi river	1927	525
Bascule	Sault Ste. Marie	Michigan	1914	336
Masonry Arch	Plauen	Saxony	1905	295

cause of the failure was unknown.

A notable concrete arch bridge at Esla, Spain, was completed in 1940 with a span of 645 ft., establishing a new world record for concrete arches. The construction was in an advanced stage, scheduled to be completed in 1935, when the Spanish revolution interrupted the work for five years. The prior record for concrete arches was held by the Plougastel bridge over the Elorn river at Brest, France, with a span of 612 ft., completed in 1930.

Despite the war, or as a military necessity, a new highway suspension bridge over the Rhine at Rodenkirchen was completed by the nazis in 1940. Its main span of 1,246 ft. was in 1941 the longest bridge span on the European continent. Another new suspension bridge built by the nazi regime is the Reichsbruecke over the Danube at Vienna, completed 1937, with a main span of 793 ft.

The Story bridge over the Brisbane river, Queensland, with a cantilever span of 924 ft., was completed July 6, 1940, at a cost of £1,600,000. It is a government-owned toll bridge and the second longest span in Australia.

A new suspension bridge near Victoria, Australia, completed 1941, with a main span of 550 ft., has rocker towers and novel anchorages in clay. One anchorage is an open, ribbed, concrete box; the other is a pier in the water, with the horizontal component of the cable pull being taken by the approach girders.

The Rainbow bridge at Niagara Falls, with a 950-ft. steel arch (the longest hingeless arch span in the world), was completed Oct. 1941, at a cost of $4,000,000. It is a publicly owned toll bridge, replacing the old privately owned arch bridge of 840-ft. span, which was wrecked by the ice in Jan. 1938. The new arch was erected with the aid of a cable tieback system, employing the strands originally used as the temporary footbridge ropes for the Golden Gate bridge.

The new highway bridge at St. Georges over the Chesapeake and Delaware canal, under construction 1940 to 1941, is a steel tied-arch of 540-ft. span. It replaces a vertical lift bridge wrecked by a ship collision in Jan. 1939.

The longest arch bridge in Colorado, 420 ft. long and 209 ft. above the river, was completed Aug. 1940. It spans the Eagle River canyon and straddles an old low-level highway bridge, which latter in turn spans the river and the railroad tracks below. Carrying a concrete deck on two steel arch ribs, it was built by the Colorado state highway department to eliminate a dangerous stretch of mountain road.

The Meramec River bridge near St. Louis, Mo., completed 1941 with a main span of 264 ft., is of novel design. It is a continuous tied-arch, the only bridge of this type in the United States.

The Howrah bridge over the Hooghly river, India, under construction 1938 to 1941, is a cantilever bridge costing £1,750,000.

The world's highest bridge piers—concrete piers up to 360 ft. tall—are in the Pit River cantilever bridge, in California, completed 1941, with a main span of 630 ft. Carrying a railroad on the lower deck and a highway on the upper deck, the bridge was made necessary by the construction of the Shasta dam, located eight miles downstream on the Sacramento river, whereby water will be backed up to a height of 400 ft.

A new cantilever bridge at New London, Conn., under construction 1941 to 1942 at a cost of $6,000,000, with a main span of 540 ft., was to carry an express highway over the deep tidal estuary of the Thames river.

The new bridge over the Connecticut river at Hartford, under construction 1940 to 1942, was to have three continuous steel girder spans of 270, 300 and 270 ft., respectively, establishing a new record for the longest continuous girder span in the United States. During the erection of the first span, at the Hartford shore, a falsework failure on Dec. 4, 1941, caused the loss of 15 lives.

Three notable vertical lift bridges were completed in 1941: A 365-ft. span flanked by towers 200 ft. high over the St. Johns river at Jacksonville, Fla.; a 332·5-ft. span over the Passaic river in New Jersey; and a double-deck 224-ft. span, with towers 207·5 ft. high, carrying railroad and U.S. Highway No. 1 over the Piscataqua river between Portsmouth, N.H., and Kittery, Me.

In the new Kentucky River bridge at Clay's ferry, Ky., a continuous truss bridge with spans of 320, 448 and 320 ft., respectively, under construction 1941 to 1942, the tallest pier is 205 ft. high.

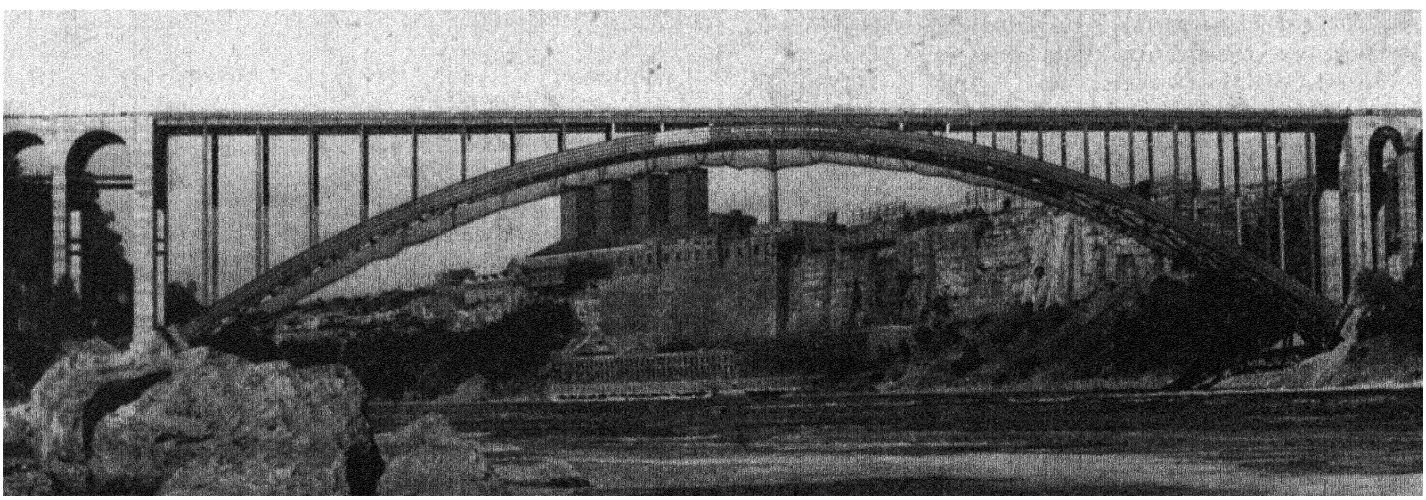
A novel bridge at Santa Paula, Calif., completed June 1940, is a cellular girder of reinforced concrete, with a clear span of 120 ft. It is only 2 ft. 9 in. deep at mid-span, a new record for slenderness of such spans. By using the rigid frame type with counterweighted abutments, the bending movements were reduced to one-fourth the usual amount.

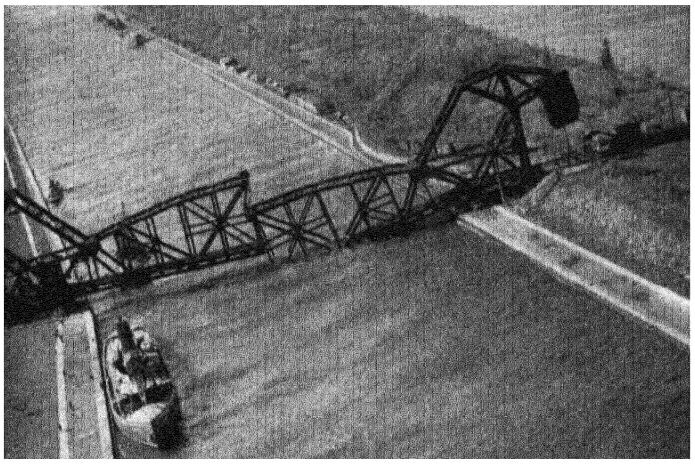
The artistic bridge awards of the American Institute of Steel Construction for bridges completed in 1940 went to the Susquehanna River bridge at Havre de Grace, Md., containing 36 Wichert continuous trusses and girders, including two 456-ft. spans of arch outline; the Dunning Creek bridge on the Pennsylvania turnpike, comprising six continuous girder spans with arched lower flanges; a suspension bridge of 360-ft. span over the Klamath river in California; and the Oceanic bridge over the Navesink river in New Jersey, a double-leaf bascule of 98-ft. span.

The Santa Fe Railway bridge at Los Angeles, built in 1901, was wrecked March 4, 1941, by high water causing overturning or settlement of one pier with the consequent collapse of a 200-ft. truss span and a 90-ft. girder span.

A notable cantilever bridge at Cernavoda, Rumania, built in 1896 with a main span of 623 ft., was crippled by military operations in World War I and was subsequently rebuilt, only to be

RAINBOW BRIDGE at Niagara Falls, shortly before its dedication in the fall of 1941





COLLAPSING end of a freight train, a bridge over St. Marys Falls canal at Sault Ste. Marie, Mich. fell into the canal Oct. 7, 1941 and held up many ore-laden freighters. The locomotive and tender sank into the canal; two trainmen were drowned

wrecked again, more seriously, in 1941.

In Great Britain aerial bomb damage to both highways and railways was surprisingly low, and relatively few bridges were hit. In instances where there was a hit, the bomb as a rule merely punctured the deck, exploding in the water or mud beneath, with very little damage to the structure. (D. B. S.)

Briquettes, Fuel: *see* FUEL BRIQUETTES.
British Borneo: *see* BORNEO.

British Columbia.

Bordering on the Pacific ocean, British Columbia is the most westerly province of the dominion of Canada. Area, 366,255 sq.mi., of which about 8% is considered to be agricultural land. The forest and mining industries flourish over much of the remaining heavily timbered and rugged terrain. The population of the province, 809,203 persons (1941), is concentrated in the southwestern corner, mainly in the cities of Vancouver, Victoria and New Westminster. The greater part of Canada's oriental population is resident in this province, comprising about 90% of the Japanese (23,428, nearly half of whom are Japanese nationals) and 60% of the Chinese (20,500).

History.—In Jan. 1941, at the invitation of the dominion government, delegates of the provincial government attended a dominion-provincial conference in Ottawa, called to consider the adoption of Plan One as submitted by the Rowell-Sirois commission on dominion-provincial relations. At the conference, T. D. Pattullo, premier of British Columbia, declined to accept the Sirois plan as the sole basis for discussion on the ground that the plan would, if implemented, place the province permanently in an adverse financial position. The premier, who had been consistently opposed to the suggestion that the provinces should withdraw from the income and inheritance taxation fields in favour of the dominion, also contended that centralization of economic control in the dominion government would be unduly increased under the plan. Returning to Victoria, after Prime Minister King had closed the two-day conference in the face of active opposition from three provincial governments, Premier Pattullo and his Liberal government encountered severe press criticism. In June, J. L. Ilsley, dominion minister of finance, submitted a compromise plan to the provincial governments. Offering compensation, Ilsley asked all provinces to withdraw from the income and inheritance tax fields for the duration of the war. Seeking reelection in October, the Liberal government announced its intention to accept the compromise plan if returned to office. In the election of Oct. 21, the Liberal administration failed to obtain a majority in the legislative assembly; there were elected 21 Liberals, 14 Co-operative Commonwealth Federationists, 12 Conservatives and 1 Independent Labourite. Favouring a coalition government and dissatisfied with Premier Pattullo's decision to form a new minority Liberal government, four members of the cabinet resigned. Failing to secure support for his policies, Premier Pattullo resigned as leader of the Liberal party Dec. 2. When the legislative assembly convened Dec. 4, Premier Pattullo announced the resignation of his cabinet. No legislation was introduced during the single day session of the assembly, which was adjourned until Jan. 8, 1942. Called by Lieutenant Governor W. C. Woodward to form a government, the new provincial Liberal leader, John Hart, announced the formation of a Liberal and Conservative coalition government Dec. 10, indicating that the C.C.F. members had declined an earlier invitation to join in the formation of a union government. The new cabinet, comprising eight ministers, included P. Maitland, leader of the provincial Conservative party, and two other Conservatives; the remaining five portfolios were held by Liberals. The C.C.F. members of the legislative assembly, under the leadership of Harold Winch, constituted the opposition.

Other events during 1941 included the appointment of G. McG. Sloan, puisne justice of the court of appeal, as commissioner to inquire into the administrative policy of the Workmen's Compensation board, in July; the visit of H.R.H. the duke of Kent, and the appointment of W. C. Woodward, Vancouver merchant, as lieutenant governor, in August. In September, a single commissioner, Judge A. M. Millar, was appointed to investigate the operations of the provincial marketing boards. On Dec. 8, as a result of war conditions in the Pacific area, the province experienced its first "blackout."

Manufacturing, Trade, Agriculture, Minerals.—Stimulated by the extraordinary requirements of war, the tempo of business activity increased steadily during 1941. As employment increased, the enlarged purchasing power and rising production costs began to make their influence felt and, during the first nine months of 1941, the cost of living rose sharply—20% above Aug. 1939, in the principal coast cities. The introduction of price and wage control by the federal government in November, together with the dominion wartime taxation measures of the spring, showed signs of restraining this inflationary tendency in the latter part of the year. The important foreign commerce of the province, previously affected but lightly by the hostilities in Europe, showed a minor reduction as a result of the entry of Japan into the war in December. According to preliminary provincial estimates, the value of production amounted to $55,000,000 in agriculture (1940, $51,772,571); $22,000,000 in fisheries (1940, $21,710,167); $118,000,000 in forestry (1940, $102,804,000); and $75,000,000 in mining (1940, $75,352,730). (G. N. P.)

British East Africa.

Under this heading are grouped British colonial territories on the east coast of Africa, of which certain essential statistics are given in the table on page 118. *See* BRITISH EMPIRE for population, capital towns, status and governors. (*See* also RHODESIA.)

History.—The tendency of the East African colonies to unite in common action both for military and civil purposes began with the outbreak of war against Italy in 1940. A joint delegation from the East African colonies went to the Eastern Group conference at Delhi in 1941, the first time that a delegation representative of all sections of the East African territories set out to deal with problems mutually affecting the welfare of all. A war supplies board and a civil supplies board for East Africa were set up, the latter to carry out policy with regard to con-

British East Africa

Territory and Area in sq.mi.	Principal Products	Imports and Exports (in thousand £)	Road, Rail and Shipping	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary
KENYA 224,960	(1940 exports) coffee 165,974 cwt. (£406,283); sisal 23,748 tons; pyrethrum 97,720 cwt.; gold 104,015 oz.	(1940) imp. 9,041; exp. 4,092	(1937) rds. arterial, 3,160 mi.; rlys. 1,290 mi.; shpg. cleared 2,158,767 net tons	(1939) rev. 3,812; exp. 3,808	(1937) Europ.: schls., 35, schlrs., 2,091; African: schls., 52, schlrs., 4,503; Indian: schlrs., 7,635; mission schls. 100
MAURITIUS 720 (dependencies, 87)	(1939 metric tons) sugar 229,457; copra 1,600	(1939) imp. Rs. 33,303; exp. Rs. 37,188	(1939) rds. 700 mi.; rly. 141 mi.; shpg. cleared 776,454 net tons	(est. 1939–40) rev. Rs. 17,330; exp. Rs. 17,324	(1938) schls., 126; schlrs., 39,952
NYASALAND 47,949	(1939 metric tons) tobacco 6,600; tea 5,100	(1940) imp. 793.0; exp. 1042.3	(1937) rds. main, 1,852 mi.; rly. 289 mi.	(1940) rev. 999.7; exp. 1002.0	(1939) elem.: Europ.: schls., 4, schlrs., 117; African: schls., 4,279, schlrs., 204,761
SEYCHELLES 156	(1939 metric tons) export: copra 4,700; cinnamon leaf oil 67.3	(1939) imp. Rs. 1,150; exp. Rs. 1,284	(1938) 46 mi. of 1st class cart rd.	(est. 1939) rev. Rs. 833; exp. Rs. 904	(1938) elem. schls., 26; schlrs., 5,648; sec. schls., 2; schlrs., 395
BRITISH SOMALILAND 68,000	(1938 exports) gums and resins 594 metric tons; skins, number, 1,690,883	(1938) imp. 568; exp. 212	(1938) rds. for wheeled traffic, *c.* 2,000 mi.	(1938) rev. 206; exp. 227	(1938) elem.: govt. schls., 2; schlrs., 121; private-aided schls., 14; schlrs., 514
TANGANYIKA 360,000	(1940 exports) coffee 312,680 cwt. (£440,903); sisal 78,528 tons	imp. 3,001; exp. 5,183	(1938) rds. 2,783 mi.; rly. 1,377 mi.; shpg. cleared 3,077,051 net tons	(1940) rev. 2,308; exp. 2,258	(1938) elem.: Europ.: schls., 19; schlrs., 934; Indian: schls., 67, schlrs., 5,128; African: schls., 1,014, schlrs., 76,360
UGANDA 93,981	(1940 exports) coffee 343,016 cwt. (£460,405); cotton 54,206 tons (£3,760,109)	imp. 1,984; exp. 5,155	(1938) rds. 7,488 mi.; rly. 332 mi.	(1940) rev. 1,718; exp. 2,260	(1938) elem.: schls., 300, schlrs., 34,232; sec.: schls., 22, schlrs., 1,250
ZANZIBAR (640) and PEMBA (380)	(1940 exports) cloves 217,813 cwt.; copra 184,890 cwt.	imp. 876; exp. 881	(1939) rds. (Z.) 151 mi.; (P.) 71 mi.	(1939) rev. 499; exp. 452	(1938) elem.: schlrs. (govt. schls.) 2,428, (private schls.) 2,930

trol of imports, currency and exchange and supplies for civil needs. The former did excellent work in support of Gen. Alan Cunningham's advance into Italian East Africa from the south. The East African governors met in conference in January. A conference on yellow fever was held in Nairobi, at which there were representatives of the health services of the Sudan, Kenya, Uganda, Tanganyika, Nyasaland, the Rhodesias, South Africa, the Belgian Congo and the military forces of East Africa. The chief recommendation was the extermination of the yellow fever carrier mosquito from all seaports, all urban centres and aerodromes, and all lines of communication.

In the East African campaigns, soldiers from East Africa, South Africa, West Africa and the Rhodesias, white and black, fought together. Officials from some of the East African colonies were made responsible for civil administration in the former Italian colonies.

(*See* WORLD WAR II.)

Kenya.—The governor of Kenya received a visit from the governor general of the Belgian Congo and paid him a return visit. A personal tax was introduced for Europeans and Asiatics in Kenya. A mobile cinema van, to show pictures and give talks to Africans about the war and other matters of general interest was a great success.

Uganda.—Experiments were being made to introduce crops likely to develop secondary industries. Flax and flue-cured tobacco were being grown with this in view. The principal commercial crops had a successful year. Uganda African truck drivers distinguished themselves in the military transport services.

British Somaliland.—This territory, taken by the Italians Aug. 19, 1940, was reoccupied by British forces in March 1941. Berbera, the capital, was captured March 16 by a landing force supported by the navy and the R.A.F. Hargeisa fell a few days later, and the British, joined by empire forces from Italian Somaliland, proceeded to the conquest of Abyssinia.

Tanganyika.—A labour department was set up and a labour commissioner was appointed to deal with the most urgent improvements in labour conditions. The Dar-es-Salaam township authority included lady members, Africans and an unofficial majority. The Masai, a wild and warlike tribe, offered to sell 6,000 head of cattle a year and to divide the proceeds between gifts to the government for war purposes and a development fund for the Masai country. A successful campaign against rinderpest was carried out in co-operation with the veterinary officers of Northern Rhodesia.

Zanzibar.—The sultan of Zanzibar more than once broadcast to his people to support the British cause, emphasizing that the well-being of the Moslem world was bound up with a British victory. The clove industry, on which Zanzibar's prosperity depends, reached a stage where new development was necessary, as large areas of clove trees were reaching the end of their economic life, which is 60–70 years. It was proposed to replant the best lands with cloves, and to use the marginal lands for other export crops such as pineapples.

Regular nursing training for women began—an innovation in a Moslem territory. The first batch of probationers included both Arabs and Africans.

Nyasaland.—The 50th anniversary of the protectorate was celebrated in 1941. Nyasaland Africans were in great demand for the King's African Rifles, as infantrymen and as skilled mechanics and signallers; and the demand for workers on Southern Rhodesian mines and farms was constant.

The native labour association of the Rand mines suspended its recruiting until the military requirements were met and put its organization at the disposal of the Nyasaland government. A junior secondary school, long awaited, was opened at Blantyre. The governor in his opening speech paid tribute to the educational work of the missions.

Mauritius.—A department of education was created, with a director to control the educational system of the country. One of the objectives is the better teaching of English and the spread of the English language.

Special programs were introduced in Hindustani for the Indian population to counteract the German Hindustani radio propaganda. (M. RD.)

British Empire. The governments of the British empire and the governors and premiers were as follows as of Dec. 1, 1941:

Country	Area Sq. miles (approx.)	Population (000's omitted) (est. 1938)	Capital	Status	Governors and Premiers
Europe					
Great Britain and Northern Ireland	93,091	47,600	London	Kingdom	George VI, King-Emperor. *Prime Minister* of Great Britain: Winston Churchill. Governor of Northern Ireland: The Duke of Abercorn. *Prime Minister* of Northern Ireland: J. M. Andrews.
Channel Islands	75	96	St. Helier / St. Peter Port	Kingdom of Great Britain and N. Ireland	*Jersey:* Maj. Gen. J. M. R. Harrison. *Guernsey:* Maj. Gen. A. P. D. Telfer-Smollett.
Eire	26,601	2,934*	Dublin	Dominion	*President:* Dr. Douglas Hyde. *Prime Minister:* Eamon de Valera.
Gibraltar	2	20	Gibraltar	Colony	General the Viscount Gort.
Isle of Man	227	49	Douglas	Kingdom of Great Britain and N. Ireland	Vice-Adm. Lord Granville.
Malta	122	269	Valletta	Colony	Lt. Gen. Sir W. G. S. Dobbie.
Asia					
Aden, Perim, etc.	80	48	Aden	Colony	Sir J. Hathorn Hall.
Aden Protectorate	112,000	600		Protectorate	
Bahrein Islands	213	120	Manama	Protectorate	Ruler: H. H. Shaikh Sir Hamad bin 'Isa al Khalifah.
Borneo:					
State of North Borneo	29,500	302	Sandakan	Protectorate	C. R. Smith, Gov.
Brunei	2,226	38	Brunei	Protectorate	J. G. Black (Brit. Res.)
Sarawak	50,000	c. 450	Kuching	Protectorate	Rajah: H. H. Sir Charles Vyner Brooke.
Burma	261,610	16,824†	Rangoon	Member of the British Commonwealth of Nations	Sir R. Dorman-Smith; Premier: U Saw.
Ceylon	25,332	5,992*	Colombo	Colony	Sir A. Caldecott.
Cyprus	3,572	377	Nicosia	Colony	C. C. Woolley.
Hongkong	391	1,040	Victoria	Colony	Sir M. A. Young, Gov.
Indian Empire	1,575,187	388,800†	Delhi	Member of the British Commonwealth of Nations	Emperor of India: H.I.M. George VI. *Secretary of State:* L. S. Amery. *Viceroy and Governor General:* Marquess of Linlithgow.
Malaya:					
The Straits Settlements	1,357	1,358	Singapore	Colony	Sir T. S. W. Thomas, Gov.
Federated Malay States	27,700	2,108		Protectorates	The Rulers of Perak, Selangor, Negri Sembilan, and Pahang.
Unfederated Malay States	24,347	1,820		Protectorates	The Rulers of Johore, Kedah, Perlis, Kelantan, Brunei, and Trengganu.
Palestine	10,100	1,466*	Jerusalem	Mandated territory	Sir H. A. MacMichael, High Commissioner
Trans-Jordan	34,740	350	Amman	Mandated territory	Emir H. H. Abdullah ibn Hussein
Africa					
Kenya Colony and Protectorate	224,960	3,366	Nairobi	Colony and protectorate	Sir Henry Monck-Mason Moore.
Uganda Protectorate	93,081	3,745	Entebbe	Protectorate	Sir Charles Dundas.
Zanzibar	1,020	242	Zanzibar	Colony and protectorate	Sir Henry Guy Pilling (Brit. Res.)
Mauritius	809	416	Port Louis	Colony	Sir Bede Clifford.
Nyasaland	47,949	1,076	Blantyre	Protectorate	Sir Donald Mackenzie-Kennedy.
St. Helena and Ascension	81	4	Jamestown	Colony	Major W. B. Gray.
Seychelles	156	31	Victoria	Colony	Sir A. F. Grimble.
Somaliland Protectorate	68,000	350	Berbera	Protectorate	V. G. Glenday.
Basutoland Protectorate	11,716	580	Maseru	Protectorate	Lord Harlech.
Bechuanaland Protectorate	275,000	275	Mafeking, in Cape Province	Protectorate	Lord Harlech.
Southern Rhodesia	150,333	1,390	Salisbury	Self-governing colony	Sir H. J. Stanley.
Northern Rhodesia	290,323	1,400	Lusaka	Colony	Sir E. J. Waddington.
Swaziland	6,705	160	Mbabane	Protectorate	Lord Harlech.
Union of South Africa	472,550	10,160	Seat of Government, Pretoria / Seat of legislature, Cape Town	Dominion	Sir P. Duncan. *Premier:* General J. C. Smuts.
South-West Africa	317,725	293	Windhoek	Mandated territory	Dr. D. G. Conradie, Administrator.
Nigeria, including British Cameroons	372,674	19,725	Lagos	Colony and protectorate and mandated territory	Sir B. H. Bourdillon.
Gambia	3,990	205	Bathurst	Colony	Sir W. T. Southorn.
Gold Coast, including British Togoland	91,843	3,450	Accra	Colony and protectorate and mandated territory	Sir Alan Burns.
Sierra Leone and Protectorate	27,925	1,970	Freetown	Colony and protectorate	Major Sir H. C. Stevenson.
Anglo-Egyptian Sudan	967,500	6,362†	Khartoum	Condominium	Sir H. Huddleston.
Tanganyika Territory	360,000	5,258	Dar-es-Salaam	Mandated territory	Sir W. E. F. Jackson.
America					
Bahamas	4,375	68	Nassau	Colony	H.R.H. Duke of Windsor.
Barbados	166	193	Bridgetown	Colony	Sir H. Grattan Bushe.
Bermudas	19	31	Hamilton	Colony	Lord Knollys.
British Guiana	80,500	338	Georgetown	Colony	Sir G. J. Lethem.
British Honduras	8,598	58	Belize	Colony	J. A. Hunter.
Canada	3,729,665	11,225	Ottawa	Dominion	Earl of Athlone. *Premier:* W. L. Mackenzie King.

*Pop. est. 1939 †Pop. est. 1941

(*Continued on next page*)

British Empire (continued)

Country	Area Sq. miles (approx.)	Population (000's omitted) (est. 1938)	Capital	Status	Governors and Premiers
America (Continued)					
Falkland Islands and Dependencies	4,618	3	Port Stanley	Colony	A. W. Cardinall.
Jamaica and Dependencies	4,840	1,180	Kingston	Colony	Sir A. F. Richards.
Leeward Islands (Antigua, St. Kitts-Nevis, Montserrat, and the Virgin Islands)	422	93*	St. John (Antigua)	Colony	Sir D. J. Jardine
Newfoundland and Labrador	*c.* 152,000	295	St. John's	Colony, Constitution suspended	Vice-Adm. Sir H. T. Walwyn.
Trinidad and Tobago	1,980	465	Port of Spain	Colony	Maj. Sir H. W. Young.
Windward Islands (Grenada, Dominica, St. Vincent, and St. Lucia)	825	271*	St. George's (Grenada)	Colony	Sir H. B. Popham.
Oceania					
Commonwealth of Australia	2,974,581	6,930	Canberra	Dominion	Brig. Gen. Lord Gowrie. *Premier:* J. Curtin.
Fiji	7,055	211	Suva	Colony	Sir H. C. Luke.
New Zealand	103,415	1,618	Wellington	Dominion	Marshal of R. A. F., Sir Cyril Newall. *Premier:* Peter Fraser.
Papua	90,540	280	Port Moresby	Part of Commonwealth of Australia	H. L. Murray, Administrator.
Pacific Islands	11,911	162		Colonies and protectorate	Sir H. C. Luke.
New Hebrides	5,700	50	Vila	Condominium	Sir H. C. Luke.
New Guinea, Territory of	93,000	670	Rabaul	Mandated territory	Brig. Gen. W. Ramsay McNicoll
Western Samoa	1,133	59	Apia	Mandated territory	A. C. Turnbull, Act. Administrator.
Nauru	8	3		Mandated territory	Lt. Col. F. R. Chalmers.

*Pop. est. 1939 †Pop. est. 1941

British Guiana, a British crown colony in northeastern South America. Area, 89,480 sq.mi. The population (1931 census: 310,933; 1938 official est.: 337,521) is largely East Indian (42%) and Negro (38%). East Indians are numerically greater than in any other American area except Trinidad, and proportionately more than in any except Surinam. The chief cities are Georgetown, the capital (67,584) and New Amsterdam (9,514). Bartica, main outlet of the diamond and bauxite areas, was rapidly growing in importance in 1941. Governor in 1941: Sir Gordon Lethem (succeeded Sir Wilfred F. Jackson July 4, 1941).

History.—Throughout 1941, constitutional reforms involving broadening of the franchise and other changes were under discussion. A new labour code, with minimum-wage provisions, was also in preparation. In July the United States formally took over the bases acquired under the "destroyer-base exchange" agreement of Sept. 1940: a seaplane base near Suddie, at the mouth of the Essequibo river, and Atkinson field, a patrol plane and squadron base, with a 4,708 ac. aerodrome, on the Demerara river, 25 mi. from its mouth.

The colony continued to feel the economic effects of World War II, with reduced diamond and other exports, but higher sugar and bauxite returns. Contributions and loans in support of the imperial war effort were made on an increasingly large scale.

Education.—In 1938 British Guiana had 239 primary schools, with an enrolment of 53,373, and seven secondary schools.

Finance.—The monetary unit is the British Guiana dollar, tied to the pound sterling at 4.8665 and normally equal to the United States dollar (1941 value: 83¼ cents U.S.).

Trade.—In 1940 imports (primarily foodstuffs, textiles and miscellaneous manufactured goods) increased 26.8%, to $14,337,242 (all values in British Guiana dollars), with a further 10% rise in the first eight months of 1941. Under wartime regulations, no public report was made of bauxite exports (19.7% of the 1939 total). Exports in 1940 (except bauxite) were $10,479,100, 4% less than the full 1939 figure. The principal exports were sugar, 142,707 tons (68% of export value); gold, 33,058 oz. (9.9%); rum, 1,811,535 gal. (7%); rice, 11,676 tons (6.7%); diamonds, 17,559 carats (2.6%). Timber (2%), molasses (1.9%) and balata (1.5%) were also important. Export values in the first eight months of 1941 ($6,560,470) were 80% from sugar.

Communication.—External communication is good, with frequent steamship and air transport service. Within the colony, however, railways (79 mi. in 1941) and highways (322 mi.) are practically restricted to the coastal plain. Except for some roads to the diamond centres and a 300-mi. cattle trail to the far interior, interior communication is primitive and entirely by navigable rivers. Improvement of waterways and other communication, however, was the subject of several intensive studies after 1939.

Resources.—British Guiana is, essentially, an undeveloped region. Agriculture is restricted to the coastal plain, with the chief crops sugar (70,622 ac.; 1939: 189,245 tons; 1940, 167,645 tons) and rice (72,132 ac.; 1939: 67,314 tons; 1940: 51,580 tons). The annual wage of sugar estate labourers alone is well over $5,000,000 (1940: $5,177,780; Jan.–Aug. 1941: $5,319,549). Coco-nuts (25,000 ac.), pineapples and some coffee (annual export: 25,000 lb.) are also grown.

Bauxite, diamonds and gold are the leading minerals. In 1941, bauxite was being developed at a rapid pace, and although no statistics were published, on the basis of Surinam's experience (*see* SURINAM), 1941 production may be presumed to have at least doubled that of 1939.

Forests cover 87.4% of the colony's area, with extensive stands of valuable greenheart and other hardwoods, and were all but undeveloped in 1941. Balata, for machine belting, and some tree gums are also collected. The interior highlands have great possibilities for white settlement, but lack of communications has kept them virtually unoccupied. Several rivers are potential sources of hydroelectric power on a large scale; Kaieteur falls, on the Potari river, is estimated to have a greater potential capacity than has Niagara. (L. W. BE.)

British Honduras, British crown colony in northern Central America bordered by Guatemala on the west and Mexico on the north. Area, 8,598 sq.mi. The boundaries with Guatemala were settled in 1859; Guatemala, however, officially reopened the question early in 1939, but two years later formally announced it would not be pressed for the duration of World War II. The population by the 1931 census was 51,347, and was officially estimated at 58,759 as of Dec. 31, 1939. The capital is Belize (1931 pop.: 16,687).

History.—The year 1941 was marked by considerable unemployment and consequent economic depression, the direct effect of war disruption of the colony's trade. In November a hurricane destroyed an estimated 45% of the still-unpicked citrus crop. Meanwhile, efforts were directed especially toward increased production of foodstuffs, particularly beans, corn and rice, with the object of reducing importations.

Education.—The colony had 106 elementary schools in 1941, with a total enrolment of more than 10,000, and five secondary schools, with nearly 500 enrolment.

Finance.—The monetary unit, the British Honduras dollar, is valued at 4.8665 to the pound sterling, and normally is equivalent to the United States dollar, with a 1941 exchange value of around 83 cents U.S.

Trade.—In 1940, exports were valued at 3,039,505 British Honduras dollars (1939: 2,519,674); imports at 3,318,070 (1939: 3,532,059). Imports are chiefly foodstuffs (1940 value: 521,939 British Honduras dollars), textiles, machinery and other manufactured goods. Imported foodstuffs comprised flour and condensed milk especially (28% each), and rice, beans and peas, pork and lard. The colony serves as an important trade intermediary between adjacent sections of Mexico and the outside. In 1940, re-exports aggregated 47.3% of all exports. In 1940 domestic exports were valued at 1,620,680 British Honduras dollars, with forest products 82% (79.6% over an 18-year period). In 1939 mahogany logs, mahogany timber and chicle represented 31.5%, 18.5% and 20.3%, respectively, of all domestic

exports. Agricultural products were 17.75% of all domestic exports, chiefly bananas (9.5%), grapefruit (4.26%), and coco-nuts (2.73%). Banana production (1939: 522,578 stems; 1940: 437,432) was taken entirely by the United States, as was most of the coco-nut crop; grapefruit was taken by Great Britain and Canada. Marine products (sponges and tortoise shell) represented 0.25% of 1940 exports.

Communication.—Belize has regular steamer service to New Orleans, Kingston and Tampa. Central American Air Transport (TACA) provides a semiweekly service from San Pedro Sula, Honduras, to Belize and other points. Navigable rivers handle considerable domestic traffic. The colony had one 25-mi. railway in 1941, primarily used for logging; and 185 mi. of improved highway, but few subsidiary roads.

(L. W. Be.)

British Legion. The organization and machinery of the legion, extended to cater for the needs of the men of World War II as well as of World War I functioned to its full extent, and by mid-1941 there were more than 12,000 cases from the war in progress on the books. Its representatives on the ministry of pensions' central advisory committee did much successful work in connection with the redrafting of the royal warrant relating to compensation for death and disablement in the war in progress, and in other matters; a special committee studied the whole problem of demobilization and resettlement; and, at the request of the war office, a scheme was prepared for the organization of the sons of veterans of World War I as air force cadets. For 1941 the principal officers, including Major Gen. Sir Frederick Maurice, president, and Col. A. S. L. Ashwanden, chairman, were re-elected.

Amended figures for Poppy day 1939 collection showed that it reached the record of £596,102; in 1940 it amounted to £595,200, making since 1921, when the appeal was first launched, a grand total of nearly £8,836,000. Both the main body of the legion and its women's section presented numerous mobile canteens to the Queen's Messenger convoys and to the London county council for London's homeless.

British Malaya: *see* Federated Malay States; Japan; Straits Settlements; Unfederated Malay States; World War II.

British Pacific Islands: *see* Pacific Islands, British.

British Possessions in the Mediterranean.

These comprise Gibraltar, the Maltese islands and Cyprus, of which the table below gives certain statistics. (*See* also British Empire.)

History.—During 1941 these islands played an increasingly prominent part in the war, especially Malta, the possession of which became of immense importance to both sides, for it lies athwart the direct route between the axis powers and their North African outposts.

The defense of Gibraltar had been completely modernized by May 1941. By August almost the entire civil population had been evacuated. Though extra precautions had to be taken in the spring on reports that Germany was seeking permission to send five divisions through Spain to attack the garrison, relations with the Spanish government remained friendly. In May there was an attack on the Rock—with great loss to themselves—by airmen (reported to be French) from French Morocco; in July Italian planes, intending to attack it, bombed instead La Linea, on the other side of the Spanish frontier, and in September some Italian torpedo boats did slight damage in the harbour. The duke of Gloucester paid the garrison a six days' visit in October.

During the year Malta was not only on the defensive as a naval and fleet air arm base, but became more and more a base for offensive operations. This island bore the brunt of enemy action in the Mediterranean. The defenses of Malta are exceptionally strong, its buildings are mostly of stone and Valletta is well provided with ancient subways in the rock. Although the island had been subjected to 773 raids by the end of July 1941, casualties among civilians were comparatively small, amounting to 316 killed and 265 seriously injured. The law courts and many churches and convents were destroyed, and St. John's cathedral was damaged.

Compulsory service was introduced for all males in February—military from 18 to 41, and nonmilitary from 16 to 56. In March increased taxation was announced; the deficit for 1940–41 was met by an imperial grant of £1,000,000; and the deficit for 1941–42 was estimated at £662,000.

Though Cyprus did not experience its first air raid till the middle of May, it had taken an active part in the fighting from the start. The first colonial troops in France were from the Cyprus regiment and Cypriots formed part of the British forces in Greece. The withdrawal from Crete (end of May) brought the threat of invasion nearer. The garrison was heavily reinforced by British and Imperial troops, and by September armoured detachments, artillery and anti-aircraft defenses had brought it up to full strength. Desultory bombing, causing little damage, took place from the beginning of July, but before the end of June the evacuation of women and children and all civilians (including 500 Polish refugees, many Jews from central Europe and some U.S. mining engineers) was complete. Cyprus suffered from a severe earthquake in January.

Expenditure for 1941–42 was estimated at £1,082,713; an income tax was imposed for the first time, and the taxes on tobacco, spirits and beer were raised. (L. H. D.)

British Somaliland: *see* British East Africa.

British South African Protectorates.

Under this heading are grouped the British protectorates in the south of Africa, of which certain essential statistics are given in the table on page 122. *See* British Empire for population, capital towns, status and governors. For other territories of the British empire in the south of Africa, *see* South Africa, Union of.

History.—Lord Harlech was appointed as high commissioner for Basutoland, the Bechuanaland Protectorate and Swaziland in succession to Sir Edward Harding. Each of the three protectorates was raising a company in 1941 to form an auxiliary military pio-

British Possessions in the Mediterranean

Territory and Area in sq. mi.	Population (est. Dec. 31, 1938)	Principal Products 1939 (in metric tons)	Imports and Exports 1938 (in thousand £)	Road, Rail and Shipping 1938	Revenue and Expenditure (in thousand £)	Education, Elementary and Secondary 1938
Gibraltar, 1.76	20,139	..	free port: no statistics kept	shpg. cleared, 13,748,978 tons net	(1938) rev. 208 exp. 200	elem. schools 13; scholars 2,714; sec. schools 4; scholars 450
Malta, 122	268,668	potatoes, 31,500 wheat, 7,600	imp. 3,866 exp. 219 re-exp. 468	rds. Malta 267 mi. Gozo 68 mi.	(est. 1939-40) rev. 1,524 exp. 1,517	elem. schools 82; scholars 29,118; sec. schools 3; scholars 1,244
Cyprus, 3,572	376,529	wines, 158,000 hectolitres; pyrites (1938), 770,000; barley, 49,200; wheat, 68,300; potatoes, 31,300	imp. 2,267 exp. 2,391 re-exp. 88	rds. 862 mi. rlys. 71 mi.	(1939) rev. 920 exp. 974	elem. schools: Christian 492; Moslem 212; scholars: Christian 37,646; Moslem 7,493; sec. schools 34; scholars 4,463

British South African Protectorates

Territory and Area in sq.mi.	Principal Products 1938 (in metric tons)	Imports and Exports (in thousand £)	Road and Rail 1938	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary
BASUTOLAND 11,716	(1938-1939) wheat, 33,100; maize, 68,800	(1940) imp. 875.4 exp. 461.7	rds. 502 mi.	(1939-40) rev. 421; exp. 396	(1939) Elem. schls.: native, 848; other schls., 69; total schlrs., 82,941
BECHUANALAND c. 275,000	(1938) gold, 19,111 oz.; silver, 1,127 oz.	(1938) imp. 361 exp. 376	rds. 2,048 mi. rly. 396 mi.	(1939-40) rev. 285; exp. 272	(1939-40) schls.: Europ., 12; coloured, 2; native, 131
SWAZILAND 6,705	gold, 1,246 oz.; tin, 174 tons	(1938) exp. 116	rds. 654 mi.	(1938-39) rev. 115; exp. 161	(1939) Europ.: schls., 10; schlrs., 422; native: schls., 243; schlrs., 8,388; Eurafrican: schls., 3; schlrs., 102

neer corps for service in the middle east. All the protectorates gave generously to war funds in 1941.

Basutoland.—The paramount chief died after only one year's reign in which he had already shown the qualities of a great ruler. His principal wife was appointed regent on the advice of the council of chiefs during the minority of the heir. In a speech of greeting to the high commissioner, she expressed the readiness of the Basuto for any sacrifice to help Britain win the war. Basutoland had already given £150,000 to war funds.

Bechuanaland.—Girls' education was progressing much faster than boys', because boys were sent to mind the cattle at outposts for part of the year. Cattle post schools, staffed by itinerant teachers, had been developed to meet this situation.

(M. RD.)

British West Africa. Under this heading are grouped the British colonial territories on the west coast of Africa, for which certain essential statistics are given in the table on this page. *See* BRITISH EMPIRE for population, capital towns, status and governors. (X.)

History.—A conference of West African governors was held at Accra, and subsequently a secretariat for the conference was established in Lagos. The co-ordination of supplies for civil and military needs in British West Africa was to be one of the tasks of this office. It was announced in the official gazette that the cocoa control scheme was being operated in the interests of large populations in the Gold Coast and Nigeria who were dependent on cocoa for a livelihood. A draft was published of a workmen's compensation bill, uniform for the West African colonies, which was to come into operation shortly.

West African troops distinguished themselves in the East African campaign; and as soon as it was announced that Africans could join the R.A.F., applications began to come in; 350 were received within two months. Great interest was expressed in the fortunes of the Free French forces and especially in the appointment of M. Eboué as governor of French Equatorial Africa. Direct contact was made with the Free French territories in Africa when Gen. de Gaulle (*q.v.*) paid an official visit to Lagos. A weekly air-mail service between Lagos and the Free French and Belgian territories was operating at the end of 1941.

Nigeria.—Lagos is an important airport as well as seaport. It is the flying boats' southern terminal and the base for land planes to Khartoum and Cairo. Increases were authorized in grants to agriculture and education and a new forestry school was opened. The information office, which is almost a public relations office, works through the press, cinemas (including six mobile vans), broadcasting and literature. Secondary industries were being developed to use local products; notably there was a cassava starch industry and industries undertaking the processing of sugar, twine and castor oil.

Gold Coast and Cameroons.—There were 16 rediffusion stations in 1941 used for BBC and local broadcasts. The radio station at Accra serves Nigeria and Sierra Leone as well as the Gold Coast and the neighbouring French territories. The cocoa crops which form the chief industry in the Gold Coast were bought by the British government. The Nigerian agriculture department was responsible for maintaining former German plantations in the Cameroons.

Sierra Leone.—The government laid in large stocks of rice to meet a possible shortage, and in spite of an increased demand from people employed on war work, normal supplies were available on the market. A committee appointed to inquire into the cost of living included 8 African women out of 14 members.

Gambia.—There were large exports of ground-nuts and at the same time local food crops increased considerably so that the territory was nearly self-supporting. The British government promised to buy up to 45,000 tons of ground-nuts. A labour advisory board was appointed to advise the governor on matters concerning labour conditions. (M. RD.)

British West Indies: *see* WEST INDIES, BRITISH.
Broadcasting: *see* RADIO.

Bromine. The United States bromine production jumped from 37,882,000 lb. in 1939 to 59,266,000 lb. in 1940, and probably increased still further in 1941. Germany, France, Palestine and Italy all produce material amounts, and there are other minor outputs, but the United States usually accounts for more than 80% of the world total. (G. A. RO.)

Brooke, Sir Alan Francis (1883–), British army officer, was born at Baguères de

British West Africa

Territory and Area in sq. mi.	Principal Products	Imports & Exports (in thousand £)	Road, Rail & Shipping 1938	Revenue & Expenditure (in thousand £)	Education: Elementary & Secondary 1938
NIGERIA (including British Mandate of Cameroons) 372,674	(1938-39) (metric tons) palm kernels 117,500; ground nuts 259,000	(1939) imp. 6,757; exp. 10,409	rds. 20,900 mi.; rlys. 1,961 mi.; shpg. cleared (1939) 1,700,019 net tons	(actual 1939-40) rev. 6,113; exp. 6,499	elem. and middle schools 565; scholars 25,067
GOLD COAST (including Ashanti, Northern Territories and British Mandate of Togoland) 91,843	(1938) cocoa 239,000 metric tons; gold production (1939) 24,300 kg.	(1939) imp. 7,264; exp. 12,863	(1939) rds. 2,316 mi.; rly. 500 mi.; shpg. cleared 2,158,501 net tons	(1939-40) rev. 3,734; exp. 3,939	elem. schools 927; scholars 83,824; sec. and higher educ. scholars 2,078
ST. HELENA (47) and ASCENSION ISLANDS (34)	(1938) export flax fibre 284 tons; tow 199 tons	(1938) imp. 38; exp. 7; re-exp. 2	rds. 45 mi.	(est. 1939) rev. 16; exp. 15	812 scholars
GAMBIA 3,099	(1939-40) (metric tons) ground nuts 50,600	(1939) imp. 386; exp. 557	rds. 869 mi.; shpg. cleared 567,966 net tons	(1939) rev. 152; exp. 206	(1939) elem. schools 8; scholars 1,943; sec. schools 4; scholars 205
SIERRA LEONE 27,926	(1940 [value]) diamonds £780,770; iron ore £403,269	(1940) imp. 2,503; exp. 2,148	rds. 818; rly. 311; shpg. entered 2,725,573 tons	(act. 1939) rev. 1,131; exp. 1,165	elem. schools 253; scholars 20,851

Bigorre, France, on July 23, the son of Sir Victor Brooke. After completing his studies at the royal military academy, Woolwich, he joined the royal field artillery in 1902. He was stationed in Ireland from 1902 to 1906, then India. At the outbreak of war in 1914 he went to France, where he commanded an ammunition column. Advancing rapidly, he was soon recognized as a foremost British authority on artillery and was a general staff officer of the royal artillery at the time of the armistice. After the war he joined the staff college, Camberley, and the imperial defense college, and from 1929 to 1932 he was commandant of the school of artillery. After duty at various other military posts he was appointed in 1939 commander-in-chief of the anti-aircraft command. When Germany invaded the Low Countries on May 10, 1940, Brooke was commander of the B.E.F. 2nd corps in France. His guarding of the British retreat from Flanders was an important factor in the successful evacuation at Dunkirk. Back in England early in June, he hastily reassembled British military manpower for the expected nazi invasion and prepared a formidable series of defense zones. For his work in Flanders he was knighted, and on July 19, 1940, he was appointed to succeed Sir Edmund Ironside as commander-in-chief of the home forces.

On Nov. 18, 1941 Brooke was appointed chief of the British imperial general staff to succeed Sir John Greer Dill. Lieut.-Gen. Bernard C. Paget (*q.v.*) was named to succeed Brooke as commander-in-chief of the home forces.

Brooke-Popham, Sir Robert (1878–), British air officer, was born Sept. 18 in Mendelsham, Suffolk, Eng. Educated at Haileybury and Sandhurst, he entered the army in 1898; in 1912, he helped establish the air battalion of the royal engineers, a "freak" unit that was the forerunner of the R.A.F. During World War I, Sir Robert was one of the first six British pilots to fly over German lines, and was frequently cited for bravery. After the war, he was commandant of the R.A.F. staff college, 1921–26; head of the Iraq air command, 1928–30; air chief marshal, 1935; and inspector-general of the R.A.F., 1935–36. He retired from the army in 1937 to become governor general of Kenya, but returned to the R.A.F. as air chief marshal when Germany invaded Poland in Sept. 1939. In Nov. 1940, he was appointed commander-in-chief of British forces in the far east, but was removed from this command on Dec. 27, 1941, after he failed to stem the Jap invasion of Malaya. Sir Henry Royds Pownall (*q.v.*) succeeded him.

Brookings Institution. While the research activity of the institution in 1941 covered a broad area in economics and government, a substantial part of the program dealt primarily with problems arising from national defense. Among the studies published were the following: *Nazi Europe and World Trade,* by Cleona Lewis, an investigation of the import and export trade requirements of a possible post-war Germany which would embrace the entire continent of Europe; *Congressional Apportionment,* by Laurence E. Schmeckebier, dealing with the apportionment of representatives in congress, both among and within the states; *Government of Montgomery County, Maryland,* a study of a typical metropolitan-area residential county; *Air Mail Payment and the Government,* by F. A. Spencer, an analysis of the development and status of air mail compensation in relation to the regulation of air traffic rates; *The Presidents and Civil Disorder,* by Bennett M. Rich, a historical and analytical account of executive action to quell domestic disturbances. Pamphlet studies included the following: *Government in Relation to Agriculture,* by Edwin G. Nourse; *Fundamental Economic Issues in National Defense,* by Harold G. Moulton; *Effects of the Defense Program on Prices, Wages and Profits,* by Meyer Jacobstein and Harold G. Moulton.

Fifteen fellowships for work in the social sciences were granted to advanced graduate students for the scholastic year 1941–42. Headquarters of the Brookings institution are at 722 Jackson place N.W., Washington, D.C. (H. G. Mo.)

Brooklyn-Battery Tunnel: *see* TUNNELS.

Brower, Gerald (? –1941), U.S. colonel, was born in Brooklyn, N.Y. A graduate of Cornell university, he joined the A.E.F. in World War I. After the war he became interested in aviation and attended the Air Service Field Officers' school, the Air Service Engineering school and the Army War college. In 1940 Colonel Brower was sent to Egypt as an official U.S. air observer with the British air forces in the middle east. He was killed in a plane accident at El Obeid, near Khartoum, April 20.

Brown, Carleton Fairchild (1869–1941), U.S. philologist and educator, was born July 15 at Oberlin, O. Ordained a Unitarian minister in 1894, he spent six years in the clergy and then returned to school, studying at Harvard university, where he received his Ph.D. degree in 1903. Subsequently he taught at Harvard, Bryn Mawr, the University of Minnesota and New York university. He was the author of *A Study of the Miracle of Our Lady Told by Chaucer's Prioress* (1910). He died at Montclair, N.J., June 25.

Browne, Dame Sidney Jane (1850–1941), British nurse, known as the "modern Florence Nightingale," was born Jan. 5. She served as nurse in the Egyptian War, 1884; the Sudanese campaign, 1885; the Boer War, 1899–1902 and during World War I. Dame Browne was first president of the College of Nursing and received an honorary doctor of nursing degree from Leeds university. She was awarded the International Florence Nightingale medal by the League of Red Cross societies and the Royal Red Cross in the Boer War. In 1919 she was created Dame of the Grand Cross Order of the British Empire. Dame Browne died in Cheltenham, England, Aug. 13.

Brunei: *see* BORNEO.

Brush, George De Forest (1855–1941), U.S. painter, was born Sept. 28 at Shelbyville, Tenn. Brush won recognition for his portrait studies of American Indians and his family portraiture. His work, highly prized by collectors, often brought high prices. In 1920 his canvas, "At the Fountain," was bought by a collector from the Milch galleries for $18,000. In 1937 his painting of a little girl in a crimson bonnet was sold for $1,250, nearly four times the sum paid for a larger Gainsborough painting sold at the same time by the American Art Association Anderson galleries. An artist of the traditional school, Brush disliked the modern trend in art. He continued to paint in his later years but did not exhibit often. His "Family Group" is in the Art institute, Chicago; "Henry George" in the Metropolitan museum, New York city; "Portrait of a Lady" in the Carnegie institute, Pittsburgh and "The Moose Chase" in the National gallery, Washington, D.C. Brush died in Hanover, N.H., April 24. (See *Encyclopædia Britannica.*)

Bryn Mawr College. A resident college for women at Bryn Mawr, Pa. The 1941–42 enrolment of 666, largest in the college's history, included 163 graduate students and 503 undergraduates. The faculty and teaching staff

numbered 89. President Marion Edwards Park, having reached the retirement age in 1941, was to be succeeded by Katharine E. McBride, dean of Radcliffe college. The close co-operation with Haverford and Swarthmore colleges progressed to such an extent in 1941 that all faculty appointments were to be discussed jointly by the three college presidents before making any appointments, without limiting the complete autonomy of any of the three institutions. A special research project in the graduate school of Bryn Mawr was offered in 1941 in a joint seminar in political science, on the subject, "International Relations: A Stable World Order." The Anna Howard Shaw lectures, given by a visiting lecturer, were also on the subject of international relations. The Mary Flexner lectures were on the art of archaic Greece. (M. E. Pa.)

Bubonic Plague: *see* Plague, Bubonic.

Buckwheat. Production of buckwheat in the United States in 1941 was estimated by the department of agriculture as 6,392,000 bu., compared with 6,350,000 bu. in 1940, and a ten-year (1930–39) average of 7,315,000 bu. The acreage was 357,000 in 1941. In 1940 it was 393,000 ac.; the ten-year average, 460,000 ac. Yield per acre was 17·9 bu., compared with 16·2 bu. per acre in 1940 and a ten-year average of 16 bu.

Estimated U.S. Production of Buckwheat in Leading States, 1941 and 1940

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Pennsylvania	2,300,000	2,118,000	Wisconsin	188,000	162,000
New York	2,282,000	2,194,000	Virginia	176,000	195,000
West Virginia	254,000	245,000	Maine	144,000	120,000
Minnesota	210,000	242,000	Maryland	84,000	95,000
Michigan	208,000	310,000	North Carolina	64,000	56,000
Ohio	192,000	288,000	Indiana	52,000	94,000

(S.O.R.)

Budenny, Simeon Mikhailevich (1876–), Russian soldier, was born April 25 in Koziurin, in the Don basin, the son of a Cossack farmer. (See *Encyclopædia Britannica.*) Although a high official in both the Russian government and the army, he had had no formal schooling until he entered the Moscow military academy in 1928, from which he was graduated with honours in 1932. Budenny, who became a marshal of the soviet union in 1935, was made commander-in-chief of the Moscow district in 1937. He played an outstanding role in the final victory over the Finns in 1940, and in Aug. 1940, he was made first vice-commissar of defense. In July 1941, after the outbreak of war with Germany, he was appointed commander-in-chief of the Russian armies defending Kiev and the Ukraine. Following Stalin's "scorched earth" policy, Budenny's retreating armies blew up the huge Dnieper river dam in Aug. 1941. He was shifted from the southern front Oct. 23, 1941 and was charged with formation of new Russian armies.

Budgets, National. A national budget is an accounting statement of the government's financial transactions for a particular time period. It is customarily presented to the legislature before the start of the fiscal year so that approval of tax and expenditure proposals may be secured. In it, expected revenues of the government are set against proposed expenditures so that the deficit or surplus anticipated is clearly shown. The budget document also usually includes discussion of the financial condition of the government and recommendations of the many aspects of government fiscal policy. In the course of the depression, and even more after the outbreak of World War II, the budget message tended to become much more than a mere accounting statement. It was used as the vehicle for expressing the government's view of the requirements of the economic situation and of the relation of government fiscal policy to economic and military necessities.

United States.—In the United States, the Budget and Accounting act of 1921 provided for a national budget system and created a bureau of the budget to prepare for the president the budget of the United States government. The act directed the president to submit to congress on the first day of each regular session a budget which presented the expenditures and receipts of the federal government for the fiscal year just completed, estimated expenditures and receipts for the current and ensuing fiscal years, and balanced statements showing the condition of the treasury at the end of each of these periods.

As originally submitted by the president to congress, the federal budget for the fiscal year 1941 did not differ essentially from the actual receipts and expenditures of the fiscal year 1940, shown in Table I. With the necessity for an enlarged national defense establishment demonstrated by the war in Europe, however, that proposed plan of government operations was drastically altered after June 1940. A huge rearmament program was undertaken which grew continuously as the nation endeavoured to become the "arsenal of the democracies." Two revenue acts were also passed which raised various tax rates and imposed an excess profits tax. As a result of these measures, government expenditures in the fiscal year 1941 rose to $12,710,629,823, in contrast with outlays of $8,998,189,706 for the fiscal year 1940. National defense expenditures rose from $1,579,905,421 to $6,301,043,165 over the same period. Despite an increase in revenues of more than $1,600,000,000, the net deficit in 1941 was more than $5,000,000,000 as against $3,611,000,000 for 1940.

As the tempo of the rearmament program was speeded up, and especially after the entrance of the United States into the world-wide struggle on Dec. 8, 1941, these trends of government expenditures and revenues were greatly accelerated. A revenue act

"WE UNDERSTAND ALL THAT." A biological slant on the tax bill of 1941, by Herblock of NEA Service

was passed in 1941 designed to yield more than $3,500,000,000. It imposed excise taxes on a wide variety of commodities, increased taxes on corporate incomes and excess profits, and imposed additional levies on personal income. Under the new personal income tax, the exemption for single persons was lowered to $750 and that for married persons to $1,500, and the levies on the middle income group from $3,000 to $50,000 were sharply increased. For example, the tax on a $3,000 income for a married person was raised from 1% to 4·6% and that on a $10,000 income from 5·3% to 13·1%. These new taxes, along with the increase in government revenues that always accompanies a rising national income, were expected to yield total revenues of almost $13,000,000,000 in fiscal 1942. Expenditures on the other hand were expected to rise to more than $30,000,000,000 and national defense outlays alone to almost $24,000,000,000. The increase in the government's expenditure was expected to leave a deficit of more than $18,000,000,000 which would raise the public debt at the end of the fiscal year to more than $70,000,000,000. (*See* TAXATION.)

Table I.—*General Budget Summary of the United States*
General and Special Accounts

Classification	Est., Fiscal Year 1943	Est., Fiscal Year 1942	Actual, Fiscal Year 1941	Actual, Fiscal Year 1940
I. Receipts:				
1. Internal revenue	$17,261,367,000.00	$12,198,665,000.00	$7,361,674,982.23	$5,303,133,988.29
2. Railroad Unemployment Insurance Act	9,500,000.00	8,500,000.00	6,814,717.52	4,018,040.78
3. Customs	297,000,000.00	368,000,000.00	391,870,013.27	348,590,635.21
4. Return of surplus funds from government corporations	..	..	319,207,200.00	..
5. Other	284,223,000.00	240,915,000.00	188,945,672.48	268,193,738.48
Gross receipts	17,852,090,000.00	12,816,080,000.00	8,268,512,585.50	5,924,836,402.76
Deduct net appropriations for federal old-age and survivors insurance trust fund	1,364,890,000.00	872,087,000.00	661,300,733.42	537,711,733.00
Net receipts	$16,487,200,000.00	$11,943,993,000.00	$7,607,211,852.08	$5,387,124,669.76
II. Expenditures:				
1. Legislative, judicial and executive	$43,487,800.00	$41,329,300.00	$38,497,640.05	$36,704,687.17
2. Civil departments and agencies	797,445,700.00	844,470,700.00	782,450,994.30	910,257,548.25
Post office department, deficiency	..	14,000,000.00	30,130,553.62	41,991,378.92
3. General public works program	578,231,000.00	713,523,500.00	573,056,675.43	540,785,326.45
4. National defense	52,786,186,000.00	23,996,525,400.00	6,301,043,165.91	1,570,905,425.73
5. Veterans' pensions and benefits	590,087,000.00	578,116,000.00	550,255,646.57	550,692,391.13
6. Aids to agriculture:				
Gross expenditures	854,050,000.00	1,117,082,000.00	1,004,203,136.72	1,375,062,905.68
Return of surplus funds from government corporations	..	..	315,000,000.00*	..
7. Aids to youth	100,000,000.00	235,005,000.00	347,204,168.83	377,893,084.34
8. Social security	537,825,000.00	462,045,000.00	444,446,546.79	383,615,113.02
9. Work relief:				
Gross expenditures	480,075,000.00	942,430,000.00	1,451,910,183.92	1,861,421,985.35
Return of surplus funds from government corporations	..	..	14,000,000.00*	..
10. Refunds	87,005,000.00	89,002,000.00	89,667,290.92	91,070,763.72
11. Interest on the public debt	1,750,000,000.00	1,250,000,000.00	1,110,692,811.91	1,040,935,696.71
12. Retirement funds	208,599,800.00	267,177,262.00	217,065,000.00	207,853,400.00
13. Supplemental items—regular	25,000,000.00	25,000,000.00	..	..
Total expenditures, excluding debt retirement	$58,927,992,300.00	$30,575,706,162.00	$12,710,620,823.97	$8,098,189,706.47
III. Budget deficit under present tax legislation	42,440,792,300.00	18,631,803,162.00	5,103,417,971.89	3,611,065,036.71
IV. Receipts from proposed tax legislation	7,000,000,000.00†	..	..	..
V. Budget deficit under proposed tax legislation	35,440,792,300.00	18,631,803,162.00	5,103,417,971.89	..
VI. Debt retirement	100,000,000.00	100,000,000.00	64,260,500.00	129,184,100.00
VII. Gross deficit	35,540,792,300.00	18,731,803,162.00	5,167,678,471.89	3,740,249,136.71
Effect of Operations on the Public Debt:				
Public debt at beginning of year	$70,612,246,697.71	$48,961,443,535.71	$42,967,531,037.68	$40,430,532,411.11
Increase in public debt during year:				
To meet budget deficit above	35,440,792,300.00	18,631,803,162.00	5,103,417,971.89	3,611,065,036.71
To purchase obligations of governmental corporations	4,368,000,000.00	3,019,000,000.00	..	..
Increase in working balance, general and special accounts	..	..	890,494,526.14	1,083,066,410.14*
Net increase in public debt during year	39,808,792,300.00	21,650,803,162.00	5,993,912,498.03	2,527,998,626.57
Public debt at end of year	$110,421,038,997.71	$70,612,246,697.71	$48,961,443,535.71	$42,967,531,037.68

Source: Budget statement sent to congress by President Roosevelt on Jan. 7, 1942. Data for 1940 added for comparative purposes. *Excess of credits, deduct. †From new taxes only. The net excess in social security trust funds is estimated to be $2,000,000,000 in 1943 under proposed new legislation.

The full magnitude of the war effort that the president called for to assure the overwhelming power necessary to defeat the nation's enemies in the shortest possible time was revealed in the budget for the fiscal year 1942. The sums involved were truly staggering, constituting the largest program ever envisaged by any nation in the history of the world. Total government expenditure of almost $59,000,000,000 was contemplated for the fiscal year 1943, of which almost $53,000,000,000 were designated for national defense. The mere fact that a war expenditure of this size was expected, was a tribute to the productive resources of United States industry and labour. In order to facilitate the mobilization of the economic resources of the nation for the war effort, the president recommended that various non-defense activities of the government be curtailed, including the civil departments and agencies, the public works program, aids to agriculture and youth and the work relief program. In view of the increase in the national defense necessary to finance a huge war program, it was expected that interest on the public debt would rise by $500,000,000.

On the revenue side of the budget, it was estimated that the gross receipts of the government from existing taxes would total almost $18,000,000,000 in the fiscal year 1943, an increase of about $5,000,000,000 over the previous year and more than double the actual receipts in the fiscal year 1941. In addition to this, the president recommended that new tax measures be imposed to yield $7,000,000,000 and that the Social Security system be broadened so as to yield a further $2,000,000,000. In the aggregate, therefore, total government revenues of $27,000,000,000 were contemplated, designed not only to assist in paying for the war but to assist in preventing an inflationary rise in prices. It was recommended that congress plug up the loopholes in the existing income, estate, gift and profit taxation; that the privileged treatment given certain types of business in corporate income taxation be re-examined, and that the income from all future issues of state, municipal and authority bonds be made taxable. The president also suggested that excessive profits should be recaptured through taxation and that the basis for computing the excess be determined without relation to the level of a corporation's profits before the defense program. But in addition to these measures, the president urged an increase in such taxes as would directly aid in controlling inflation, such as income taxes collected at the source, pay roll taxes and excise taxes, and even suggested that a general sales tax might be necessary in the face of the financial and economic situation. Such taxes were to be considered emergency measures.

In spite of this broad tax program and the record federal rev-

Table II.—*Government Receipts and Expenditures—Great Britain*

(£'000)

Receipts	Actual Receipts 1940–41	Estimate for 1940–41
Inland Revenue:		
Income tax	523,949	756,000
Surtax	76,107	80,000
Estate duties	80,777	82,000
Stamps	13,678	14,000
National defense contribution	24,085	210,000
Excess profits tax	72,103	
Other inland revenue	1,015	1,000
	791,714	1,143,000
Customs and Excise:		
Customs	304,030	310,700
Excise	224,100	266,660
	529,039	577,360
Motor vehicle duties	38,006	39,000
Total tax receipts	1,358,759	1,759,360
Post office net receipt	15,323	3,300
Crown lands	1,100	1,100
Sundry loans	2,553	2,600
Miscellaneous	31,132	20,000
Total ordinary revenue	1,408,867	1,786,360

Expenditures	Exchequer Issues 1940–41	Estimate 1941–42
Consolidated fund services:		
Interest and management of national debt	212,957	255,000
Payments to N. Ireland	9,699	9,200
Other consolidated fund services	7,476	7,800
	230,132	272,000
Supply services (excluding P.O. and broadcasting):		
Defense token votes	5	4
Civil votes	402,320	418,733
Revenue departments	14,788	16,220
Votes of credit	3,220,000	3,500,000
	3,637,113	3,934,957
Total ordinary expenditure	3,867,245	4,206,057
Sinking funds	17,043	..
Total	3,884,288	4,206,957
Self-balancing Revenue and Expenditure		
Post office	81,722*	93,746*
Broadcasting	4,695	5,000
Total	86,417	99,346

*In addition, £8,700,000 was issued to the Post Office from votes of credit in 1940–41 and £4,970,000 was estimated to be so issued in 1941–42.

enues anticipated, it was estimated that the national debt would rise from approximately $70,000,000,000 to more than $110,000,000,000 in the course of the fiscal year 1943, with a gross deficit of more than $35,000,000,000. The president made it clear in his budget message that he did not expect this deficit to be financed by inflationary borrowing but from the funds that would be available because shortages of material would curtail private outlays for consumers' durable goods, for private and public construction, and for expansion and even replacements in nondefense plant and equipment. (*See* also NATIONAL DEBTS; NATIONAL INCOME; UNITED STATES.)

Great Britain.—The British budget for the fiscal year 1941–42 may well be judged the first war budget to be based on the economic requirements of total war. It contained innovations of revolutionary import—not only because of fiscal expedients adopted but because of its clear grasp of the relation between economic and fiscal needs.

In magnitude the budget was the largest in British history, both on the side of expenditures and on the side of receipts. This was the case even though the full extent of the war effort was not revealed, since the figures did not include the value of supplies expected from the United States. However, the chancellor of the exchequer, Sir Kingsley Wood, indicated that the total outlay for the fiscal year would far exceed £5,000,000,000 sterling.

The budget message was concerned not so much with the purely bookkeeping aspects of government receipts and expenditures; it was concerned primarily with the problem of how this vast sum could be spent by the government for war purposes while yet avoiding an inflation of prices and the cost of living. It was made clear that this problem had to be met by eliminating the "inflationary gap"—the excess of total private and government expenditures over the total goods and services available for purchase. This emphasis on the inflationary gap represented a conceptual innovation of great importance for it implicitly recognized that the budget deficit as such was irrelevant for the problem of war finance. What it meant in practice was that the chancellor was interested in offsetting the inflationary gap which he estimated at about £500,000,000 rather than the budget deficit of £2,420,597,000. Since closing the gap necessitated a reduction in total expenditures and since the government expenditure was necessary for the war effort, it was evident that private expenditure would have to be reduced. Otherwise inflation would be inevitable. It was proposed that half the gap be met by increased taxation and half by increased saving on the part of the public.

The new taxes were to be obtained from increased individual and business levies. Under the new rates and lowered exemptions, taxes on the highest income bracket were raised to 87½% while at the lower end of the income scale 2,000,000 new taxpayers were affected for the first time. An unmarried worker earning £110 and a married worker with two children earning £270 would in 1941 pay an income tax.

Two innovations in connection with the income tax proposals deserve special mention since they were significant indications of the trend of economic thought in democratic states. The first was that the graduation of the surtaxes on the higher incomes was so steep as to constitute an effective ceiling on personal income after taxes at about £4,000. To retain this amount required a gross income in the neighbourhood of £30,000, and there were only about 1,000 incomes of this size or over in Britain. The steepness of the graduation in the higher brackets might be judged from the fact that whereas half of a gross income of £4,000 would go for taxes, a taxpayer with a gross of £100,000 would be left with less than £6,000.

The second was the adoption of the "forced saving" plan first proposed by the famous British economist, John Maynard Keynes. It provided that the increased income taxes paid by individuals because of lowered exemptions and allowances be credited to the taxpayer and repaid to him after the war. Since there was a fairly low upper limit to the rebate, this provision primarily benefited persons at the lower end of the income scale. The plan had a twofold objective. It was designed to hold out the promise of greater economic well-being after the war for the heavy sacrifices required during the conflict. It also aimed to provide a pool of purchasing power after the war to cushion the readjustment to a peacetime economy and thus prevent severe depression.

These two measures, income ceiling and compulsory saving, undoubtedly represented the longest step ever taken by a democratic nation toward the redistribution of income by taxation.

(M. GT.)

Building and Building Industry.

The building industry, like most others in the United States, was increasingly affected during 1941 by national defense needs. Rapid expansion occurred in some places and drastic curtailment in others, especially toward the end of the year, as shortages of certain materials and of some types of labour developed.

Preliminary estimates by the bureau of labour statistics gave 615,000 non-farm family dwelling units as the number for which building permits had been issued in 1941, against 540,000 in 1940. This is an increase of 75,000 units, or nearly 14%. But 73,000 units, or close to the total increase, were financed with public funds and designated for occupancy by military and naval person-

nel or by workers directly engaged in war industries. This disposed of the frequently repeated claim that private enterprise was providing the major part of defense housing. In no year since 1928 had it built enough new dwellings even to provide for the current year's net increase in number of families and net loss through fire, demolition or conversion to other use. In 1941, it fell farther behind than in 1940.

Areas of most active residential building have been in the south Atlantic and Pacific states.

Table I.—*Permit Valuation of Building Construction in Reporting U.S. Cities With a Population of 1,000 and over, First 11 Months of 1940 and 1941, by Class of Construction*

Class of Construction	January-November, Inclusive		Percentage Change
	1941	1940	
All classes	$2,524,214,893	$2,305,104,047	+ 9.5
New residential . . .	1,372,162,266	1,183,199,779	+16.0
New nonresidential . .	809,331,826	804,118,307	+ .6
Additions, alterations and repairs	342,720,801	317,785,961	+ 7.8

Table prepared by the Division of Construction and Employment of the U.S. Bureau of Labor Statistics.

According to the Federal Housing administration forecast of mid-December, the number of new homes started during 1941 with mortgage insurance furnished by that agency, would be about 30,000 greater than the 173,062 total of 1940. This includes houses built under the much criticized Title VI, which was added to the federal housing act in March 1941 to stimulate building by private enterprise for defense workers, but did not limit it to their use, or exert any control over prices charged. Nor did it protect the transplanted worker with temporary employment from being pushed into an imprudent attempt at home ownership.

Table II.—*Number of Families Provided for in New Residential Construction in 257 Identical Cities, 1921 to 1941*

Year	Families Provided for	Year	Families Provided for	Year	Families Provided for
1921	224,545	1928	388,678	1935	55,490
1922	337,305	1929	244,394	1936	113,646
1923	453,673	1930	125,315	1937	117,307
1924	442,096	1931	98,158	1938	157,008
1925	491,032	1932	27,380	1939	203,392
1926	462,208	1933	25,885	1940	221,449
1927	406,095	1934	20,952	1941*	234,000

*Preliminary figure.
Table prepared by the Division of Construction and Employment of the U.S. Bureau of Labor Statistics.

According to the department of commerce survey of current business, the indexes of building costs for a standard six-room frame house rose from 109·3 in Jan. 1941 to 114·9 in August, the 1935–39 average being 100. Increase for the whole calendar year might average about 12%. F. W. Dodge recorded a 13·3% rise from Oct. 1940 to Oct. 1941. Efforts of the Office of Price Administration (*q.v.*) doubtless had some effect in preventing a sharper rise, though not much could be done without congressional action. Priorities in building materials were in a confused state at the close of 1941.

The stabilization of residential building costs is closely related to the stabilization of residential rents. Up to Jan. 1, 1942, nothing effective had been done except in the District of Columbia, where a comprehensive rent control act passed by congress a month earlier went into effect Jan. 1, 1942, pegging all rents where they were on Jan. 1, 1941. With the nation at war, it was to be presumed that congress would take similar action on a national scale. The chaotic condition of rents in some defense areas, with attendant hardship to workers and others of small income, and the consequent bogging down of production by excessive labour turnover, were hardly to be tolerated when so much was at stake. (*See* also BUSINESS REVIEW: *Industrial Groups;* FEDERAL HOUSING ADMINISTRATION; HOUSING; UNITED STATES: *Housing.*)

BLANDING, FLA., built to house 70,000 soldiers, rose rapidly early in 1941; workmen fitted building sections together as fast as new lumber arrived

BIBLIOGRAPHY.—Publications of the U.S. Bureau of Labor Statistics; Bureau of Foreign and Domestic Commerce; Federal Home Loan Bank Board; Federal Housing Administration; U.S. Census of Housing, 1940; F. W. Dodge Corporation. (E. E. Wo.)

Great Britain.—With the transfer of men into the armed forces and the difficulties of wartime building, the government found it increasingly necessary to direct and control this vital and complex industry. It created the ministry of works and buildings under the direction of Lord Reith, with heavy responsibilities and wide powers under different regulations to secure the highest degree of efficiency and output under difficult and changing conditions. He appointed to assist him a central council composed of representatives of the many and diverse branches of the industry, selected primarily for their experience and practical knowledge. Matters coming within their competence included: (a) mobilization of resources to secure maximum output and efficiency; (b) measures to secure the maximum concentration of these resources on vital work and to restrict nonessential work; (c) priority questions and the relationship of building programs to available resources of labour and materials, and the progress of all important jobs; (d) terms and conditions of employment affecting present output and efficiency; (e) welfare arrangements, general and particular; (f) allocation of work among contractors and builders with regard to capacity, location, size and type; (g) form of contract to suit war conditions and to secure utmost incentive to efficiency and economy; (h) control and use of construction plant and of transport equipment; (i) production and distribution of materials, their design, standardization and use; (j) education and training of personnel and problems bearing on postwar reconstruction; and (k) problems of man power arising from competing demands for labour.

There were in 1941 two main organizations of employers with a membership of 8,600 firms and probably another 50,000 smaller firms outside. To assist in organizing these firms for the maximum war effort, all undertakings and branches of the building and civil engineering industries have to register.

During 1941 the building industry was engaged almost entirely upon wartime demands. It was estimated that less than 5% of the industry's available man power was employed on purely civil building, due to the restrictions imposed by the government whereby a licence was necessary for all building costing more than £500. This amount was subsequently reduced to £100.

Great and urgent building programs were put in hand on thousands of sites up and down the country, many in areas thinly populated and difficult of access. In addition intensive bombing attacks made severe demands on the industry for a large volume of repair work and replacement of industrial buildings.

In peacetime the industry numbered some 1,400,000 workers; of these it is estimated 750,000 were engaged on the main war constructional works, and the rest with local authorities and public utilities on maintenance and on air-raid damage and running repairs.

Some traditional materials were in short supply and the government building research station was investigating the design and availability of substitute materials and fitments. (N. KE.)

Bulgaria. A kingdom in the Balkans. Area (end of 1940) *c.* 40,900 sq.mi.; pop. (est. 1940) 6,700,000. Capital: Sofia. Chief cities: Sofia (327,000); Philippopolis or Plovdiv (99,883); Varna (69,944); Ruschuk or Russé (49,447); Burgas (36,230); Plevna (31,520). Religion: mainly Greek Orthodox; 821,928 Moslems; 48,398 Jews. King: Boris III; premier, Professor Bogdan Philoff (*q.v.*).

History.—During 1941 Bulgaria continued its pro-fascist regime under the king's personal dictatorship, as established by the royal coup d'état of May 19, 1934. This government aligned Bulgaria openly with the axis powers in 1941 and participated in the German invasion of Greece and Yugoslavia, occupying large parts of their territories. Though there was much popular agitation for an alignment with the soviet union, in view of the strong sympathies of the Bulgarian masses for the U.S.S.R., Premier Philoff stressed in a speech on Jan. 12 that Bulgaria should not be influenced by any sympathies but that its policy must be guided by "Bulgaria First" principles, working only for Bulgaria, and never sacrificing anything for allegedly foreign interests. This speech prepared the Bulgarian public for a "neutrality" policy which brought Bulgaria closer and closer to the axis, against the sympathies of a large part of its population. Virtually the entire Bulgarian tobacco crop was bought by Germany at the end of January for 4,000,000,000 leva. Soon it became clear that the so-called neutrality policy of the Bulgarian government favoured the entrance of German troops into Bulgaria, thus facilitating their plans of potential aggression against Yugoslavia, Greece and Turkey. The official press clamoured for Greek Thrace, including the area between the rivers Mesta and Struma and the port of Kavalla. When Prime Minister Churchill stated on Feb. 9 that Bulgarian airports were being occupied by Germans, the Bulgarian telegraphic agency issued an official categorical denial. But it soon became clear that this denial was not founded on truth. German engineers were improving the Bulgarian highways for strategic uses. As early as Feb. 14 the Bulgarian foreign office had to admit that the country had agreed to let German armies march through to the Greek border. At the same time Bulgaria and Turkey issued a joint declaration of mutual nonaggression which indicated that Turkey, despite its alliance with Britain, and contrary to previous declarations, would not resist the crossing of the Bulgarian frontiers by German troops and the occupation of the country.

"HANDS ACROSS THE BALKANS." Germany's hand of friendship is ever a mailed fist, warned Knox of the *Memphis Commercial Appeal* as Bulgaria joined the axis March 1, 1941

By the end of February, German general staff officers arrived in Bulgaria in civilian clothes, and all the preparations for an immediate occupation of the country by large numbers of German troops seemed imminent. On March 1 the Bulgarian cabinet had officially decided to sign the axis tripartite pact; accordingly, Premier Philoff and Foreign Minister Ivan Popoff flew to Vienna, where they formally signed the treaty with Germany which gave to the Germans the official right to occupy Bulgaria. On the same day the German armies crossed the Danube from Rumania, and from that moment on, the country was fully in axis hands, and shared that general blackout, as far as authentic news is concerned, which had by 1941 covered the greatest part of the European continent. The Allied diplomats left Sofia, while mighty German columns rolled through the land. All liberal and democratic elements in Bulgaria, as well as all those who were in sympathy with the U.S.S.R., went into hiding or were arrested. While the Germans took up positions on the Greek and Yugoslav borders, the Bulgarian army was mobilized along the Turkish frontier. Although, according to the Bulgarian premier, the task of the German troops in Bulgaria was "to safeguard the peace and tranquillity of the Balkans," in reality they had gained those strategic positions which allowed them in the beginning of April to deal quick and decisive blows to Yugoslavia and Greece, whose defense positions had become infinitely more difficult as a result of Bulgaria's co-operation with Germany. The command of the German troops in Bulgaria was entrusted to General Field Marshal Sigmund List and Colonel-General Nikolaus von Falkenhorst, a specialist in mountain fighting.

As soon as the German troops smashed into Yugoslavia and Greece and defeated the armies of these two countries, Bulgarian troops who had not participated in the fighting or conquest themselves began to occupy part of the Greek and Yugoslav territories conquered by the Germans, especially Thrace and Macedonia. (*See* WORLD WAR II.) To the seven provinces of Bulgaria, three new ones were added—those of Bitolj, Skoplje and Xanthi—while the former Serb districts near Pirot and Tsaribrod were incorporated into the province of Sofia. Thus Bulgaria acquired a large additional territory in which the Greek and Serb inhabitants were subjected to systematic persecution. The territory gained from Yugoslavia, at least temporarily, was estimated at 26,000 sq.km. with about 1,500,000 people, and was economically important on account of its tobacco and opium. From Greece Bulgaria temporarily gained Macedonia with about 25,600 sq.km. and *c.* 1,600,000 inhabitants and western Thrace with 8,712 sq.km. and *c.* 350,000 inhabitants, both containing important silk, tobacco and olive production and a relatively well developed industry. With this conquest achieved, parliament amnestied the former Mace-

donian revolutionaries, among them Ivan Mihailov, the head of the IMRO. The war between Germany and the soviet union again brought forth the strong sympathies for the U.S.S.R., but the government terrorized the population into submission, though popular feeling remained strong enough to prevent Bulgaria from an open participation in the war against the soviet union. Some of the Bulgarian liberals succeeded in escaping and organized abroad a free Bulgar movement under Kosta Todorov.

Education, Defense, Finance.—Though elementary education is obligatory, the census of 1934 showed 20.4% of the males and 42.8% of the females illiterate. In 1938 Bulgaria had 7,782 schools with 30,832 teachers and 1,086,849 pupils. Military service is compulsory for all men between 17 and 65; normal military service lasts two years in peacetime. The war strength of the Bulgarian army was estimated at 500,000 men in 1941. Navy and air force were negligible. The monetary unit is the leva (=1.203 cents U.S. in 1940), stabilized at 92 leva to one gram of fine gold. The revenue and expenditure for 1939 were estimated at 7,626,000,000 leva each. On June 30, 1939, the total foreign debt amounted to 12,945,000,000, the internal debt to 8,805,000,000 leva.

Trade, Communication, Agriculture, Minerals.—Imports amounted in 1939 to 5,196,000,000 leva, of which more than half came from Germany, only 119,000,000 from the United States. In the same year exports were 6,064,000,000, of which about two-thirds went to Germany and 205,000,000 to the United States. The most important articles of import were machinery and war material, metal goods, textiles and vehicles; the most important articles of export were tobacco, fruit and eggs. In 1938 Bulgaria had 2,129 mi. of state railways, 723 post offices, 749 telegraph offices and 719 telephone exchanges.

More than 80% of the population are engaged in agriculture; the main crops are wheat, corn, barley, rye, in addition to fruit, tobacco, silkworm cocoons, cotton and sugar beets. Industry is only very little developed, but has abundant coal mines at its disposal. In addition some aluminum is mined. (H. Ko.)

Burdwan, Sir Bijay Chand Mahtab, MAHARAJADHIRAJ BAHADUR OF (1881–1941), Indian statesman and nominal ruler of more than 1,000,000 persons in India, was born Oct. 19 and became head of the Kshattriya community at the age of six. In 1908 Sir Bijay saved the lieutenant governor of Bengal from assassination and was made a member of the third class, civil division of the Indian Order of Merit, for his bravery. He was a member of the imperial legislative council, 1909–12; a member of the Bengal legislative council, 1907–18; and a member of the Bengal executive council, 1918–24. In 1926, Sir Bijay headed an Indian delegation to the British Imperial conference in London. He was the author of a number of Bengali poetical works, dramas and meditations. He died in Burdwan, India, Aug. 29.

Bureau of Standards, National: *see* STANDARDS, NATIONAL BUREAU OF.

Burma. A British province lying on the eastern side of the Bay of Bengal, between India and Thailand. Area 261,610 sq.mi.; pop. (1941) 16,823,798. Chief cities: Rangoon (cap. 498,369), Mandalay (est. 150,000), Moulmein (70,000). Governor: the Rt. Hon. Sir Reginald Dorman-Smith; prime minister in 1941: the Hon. U. Saw; languages: Burmese and English; religion: Buddhist (85%).

History.—The unfurling of the new national flag by Sir Archibald Cochrane before he relinquished the governorship marked a further stage in Burma's progress as a member of the British commonwealth. Burma's defenses were strengthened prior to the outbreak of war in the far east, and her defense measures were greatly facilitated by the ministerial stability of the government. New battalions and technical units were raised, the Burma royal naval volunteer reserve was constituted, and the first unit of the Burmese navy was launched by Lady Cochrane. Pilot officers were trained for an auxiliary air squadron and new air bases were constructed. The people of Burma contributed generously for the provision and maintenance of the first Burma squadron of fighter planes, which distinguished itself in the battle of Britain. Burma's valuable oil, mineral and teak supplies were directed into useful channels, and her general preparedness for war was announced by Sir Reginald Dorman-Smith, who succeeded to the governorship on May 6, 1941.

War did in fact come to the borders of Burma when Japan opened hostilities against the United States and Britain Dec. 7, 1941, and Thailand capitulated to Japanese forces after a token resistance. After striking south into the Malay peninsula, Japanese forces penetrated westward on the narrow isthmus into Burmese territory.

The year 1941 marked the end of the free trade policy which had for many decades regulated commerce between India and Burma. A new trade agreement substituted a commercial policy of mutual preferential treatment of goods of Indian and Burmese origin. Both Burma and China derived mutual advantage from the speed-up of traffic on the Burma road and the exchange of goodwill and trade missions. The government of Burma started construction on the 110 mi. extension of the railway line from Lashio to the Yunnan frontier, which was to link up the railway systems of Burma and China.

As in the United Kingdom, Japanese assets were frozen before the start of war, and to prevent a slump in prices the Burma government purchased the entire cotton crop, of which Japan had been importing large quantities.

Broadcasting in Burmese and English from the new Rangoon station encouraged in the local population a lively interest in social, educational, economic and international affairs. The prime minister visited Britain in October.

Japan's act of unprovoked aggression against British territory led to the British declaration of war on Dec. 8; accordingly a state of war came into existence between Burma and Japan.

Education.—In 1940 total number of institutions 27,015, scholars 851,922; primary schools 5,679, scholars 384,060; middle 1,018, scholars 139,190; high 399, scholars 94,353; special 1,172, scholars 19,190; unrecognized institutions 18,745, scholars 212,663; university, Rangoon, 2,365 students; arts college, Mandalay, 101.

Finance.—Revenue (est. 1941–42) Rs. 17 crores 13 lakhs; expenditure (est. 1941–42) 18 crores 28 lakhs; public debt (March 31, 1940) Rs. 51 crores 22 lakhs; exchange rate: rupee (Rs. 1)=1s.6d., or about 30 cents, U.S. One crore=10,000,000 rupees; one lakh=100,000 rupees.

Trade and Communication.—Overseas trade in merchandise (April–March 1940–41): imports Rs. 29 crores 55 lakhs; exports, including re-exports Rs. 55 crores 38 lakhs. Communications 1940: roads suitable for motor traffic, all weather, 6,811 mi., seasonal 5,661 mi.; railways, open to traffic 2,060 mi.; inland waterways (approx.) 1,300 mi.

Agriculture.—Production (est. 1940–41): rice 6,000,000 tons (est. 1940); ground-nuts 190,000 tons; sesamum seed (est. 1940–41) 59,000 tons; cotton (1939–40) 17,000 tons of lint; tobacco (1939–40) 136,349,730 lb.

Mineral Production.—In 1939, petroleum 275,673,364 gal.; tin concentrates 5,441 tons; tungsten concentrates 4,342 tons; tin tungsten concentrates 5,593 tons; refined lead 76,000 tons; antimonial lead 1,180 tons; zinc concentrates 59,347 tons; copper matte 7,935 tons; nickel speiss 2,896 tons; silver 6,175,000 troy oz.; gold 1,206 troy oz. (Ton=2,240 lb.) (*See* also CHINESE-JAPANESE WAR.) (H. L.; X.)

Burma Road: *see* BURMA; ROADS AND HIGHWAYS.

Buses: *see* ELECTRIC TRANSPORTATION; MOTOR TRANSPORTATION.

Bush, Vannevar (1890–), U.S. scientist and electrical engineer, was born March 11 at Everett, Mass., and took his doctor's degree in engineering at Massachusetts Institute of Technology and Harvard in 1916. During World War I, he did research on submarine detection for the U.S. navy. He was associate professor and later professor of electrical power transmission at M.I.T., 1919–32 and was vice-president and dean of engineering at that school, 1932–38. In 1939, he was named president of the Carnegie Institution of Washington. While at M.I.T., he built a famous mathematical robot which solves differential equations; this analyzer was being used in 1941 by the U.S. army to solve gunfire problems. In June 1940, President Roosevelt named him chairman of the National Defense Research committee, a scientific research group charged with co-ordinating all experimental investigation to speed up U.S. defenses. In June 1941, President Roosevelt created the new Office of Scientific

Research and Development (*q.v.*) with Dr. Bush as its director. Dr. Bush, who had also been chairman of the National Advisory Committee for Aeronautics since 1939, resigned this post in July 1941 to devote all his energies to his new job. In Oct. 1941 he said that 75% of the nation's top physicists and 50% of the top chemists were engaged in war research and that his office was co-operating with the U.S. navy and army, and with British war experts.

Bush, Wendell T. (1866–1941), U.S. educator, was born Sept. 25 in Ridgeway, Mich. He received his Ph.D. degree from Columbia in 1905 and became a lecturer at that school in the same year. In 1928 he became full professor of philosophy and 10 years later retired as professor emeritus. He was co-founder and co-editor of the *Journal of Philosophy*. Professor Bush, an authority on the sociology of religion, donated in 1935 his collection of religious fetishes, amulets and medicine bundles to Columbia. He also turned over to the school his library of philosophy and religion. He died in New York city on Feb. 10.

Business Review. In addition to the normal civilian demands for 1941, U.S. industry confronted three distinct stages in the development of defense production. From January until May, especial efforts were made to meet the needs of aid for the Allies; from June until Dec. 7, industry increased the tempo to fulfil the domestic demands for preparedness; after Dec. 7, business settled down with a grim will to meet the needs of total war.

Industrial Production.—In the first stage, production of non-defense materials was encouraged as a means of increasing civilian supplies in order to check the growing threat of inflation. Beginning as early as April 11, however, the Office of Price Administration (*q.v.*) imposed ceilings on those rising prices that were not conducive to increasing the output of industry. By Aug. 28, with the reconstituted Supply Priorities and Allocations board (*q.v.*), the administration tried through voluntary agreements with industry to increase defense output and at the same time curtail production of dispensable and competing civilian commodities. Even so, it took the outbreak of war to centralize coordinated control over U.S. industry and focus the efforts of labour and capital on the output of defense materials.

Capital for industrial defense production was derived from two sources. The investment of private funds in industry was estimated to have been more than $1,000,000,000, and the investment of public funds by the Reconstruction Finance corporation (*q.v.*) exceeded $851,000,000.

The labour reserve upon which industry could draw approximated 8,000,000 unemployed persons at the beginning of 1941, of whom all except 2,500,000 were absorbed by industrial and military expansion by May. Reliable estimates placed the average unemployment from May to October at nearly 1,600,000, or a number approximately equal to those engaged on Work Projects administration, Civilian Conservation corps and other governmental activities. Industry, however, was on the lookout for skilled and technically trained labour, competent to produce the machines for a mechanized warfare, and a shortage of this type of labour proved a bottleneck as early as August. The predicament of management became so acute, with the threat of the draft drawing an added 2,000,000 or 3,000,000 labourers into the armed forces, that industry resorted to lengthening the work week and to training unskilled labour for skilled labour needs. The use of unskilled labour forced industrial costs to rise. Inexperience both in management and labour checked the development of the industrial expansion program, which already had been handicapped by the hesitancy of capital to flow into temporary war industries.

An accurate survey of the month-by-month movements in physical production as compiled by the Federal Reserve board is shown in Table I. With the single exception of the month of April, a constant increase occurred in the total output of U.S. mills, factories and mines. Total production began the year at 140 and closed at 168, with 70% of the increase taking place during the first half of the year. The production of durable manufactured goods led the upward march of industry in a steady and uninterrupted monthly increase. If the United States had operated throughout the entire year at the same capacity as in the final quarter, the national income would have approximated $99,000,000,000. Industrial production was more than double that of the war period of 1918. Nevertheless, from the point of view of the armed forces, the weakness on the economic sector consisted in "partial support of total war"; most pronounced was the abrupt drop in the bituminous coal output caused by strikes during April, when one of the war's essential products hit the lowest level. Physical production of movable goods is most clearly observed in the month-by-month freight car loadings, and nonmovable production in the construction contracts.

Table I.—*U.S. Industrial Production Indexes, 1941*

Month	Industrial production Physical volume 1935–39=100				Freight car loadings	Construction contracts 1923–25=100		Bituminous coal	Crude petroleum
	Total	Manufactures		Minerals		Total	Residential		
		Durable	Non-Durable						
Jan.	140	171	123	119	122	103	84	44.07	110.6
Feb.	144	176	126	118	124	90	76	41.70	100.8
March	147	180	128	125	126	94	74	48.25	112.8
April	144	180	131	95	112	103	80	5.98	111.1
May	154	190	135	126	135	101	88	43.40	117.0
June	159	195	139	132	139	117	101	42.77	115.0
July	160	199	138	131	138	130	115	43.30	118.3
Aug.	160	199	139	132	130	152	112	45.65	121.4
Sept.	161	203	137	131	130	161	105	46.88	119.4
Oct.	163	207	138	130	127	145	87	49.80	..
Nov.	166	211	141	130	135	130	71	42.87	..
Dec.	168*	215*	142*	132*	137	..	..	..	..

*Estimated.

Business and the National Defense Program.—The U.S. defense program was seriously inaugurated in May 1940, when the Federal Reserve index of industrial production stood at 116, based on the 1935–39 average. The accelerating momentum of defense production both directly and indirectly forced this index upward until by Dec. 1941 it had gained 52 points. Despite this increase, however, the year 1941 marked the transition from a decade of plenty to an era of scarcity, a transition caused by the demands of preparedness and war.

War materials and munitions assumed first rank in industry, drawing labour and capital from other industries, and causing a general conversion from a peacetime to a wartime basis for many mills and factories. One of the results of this transfer of output was a further transfer in control from business to the national government. Industries began to confront price control, rationing, allotments, higher taxes, licensing, commandeering and war-profit limitations.

Industrial Conversions.—Converting peacetime plants and factories into war mills proved to be one of the most challenging problems ever to confront U.S. management. A typical case which serves to explain the nature of the conversion problem was that of General Motors corporation, whose production was converted into such an extensive war program that the cumulative value of the contracts and annual deliveries of war supplies as of Dec. 31, 1941, were as follows: for aircraft and parts, $827,000,000; for tanks, $69,000,000; for guns, mounts, controls, machine guns and rifles, $271,000,000; for ammunition, $78,000,000; for trucks,

$137,000,000; for electrical equipment, $7,000,000; and for other defense products, $13,000,000, or a total of $1,619,000,000. Of this overwhelming amount the company had deliveries to its credit of about $400,000,000 at the close of 1941. Likewise, the Ford Motor company closed the year holding more than $1,000,000,000 in orders for bombers, aircraft engines, trucks, fire control apparatus and tanks. Although the dollar value of defense contracts at the Chrysler plants was not released, it was estimated that about 70% of the productive capacity of 13 plants was converted into munition manufacture during the year, and the balance was assigned to the production of ordnance, tanks and bombers.

The fundamental economic principle of division of labour for war purposes began to manifest itself in the defense contract awards during 1941. Thus, the biggest bomber plant was assigned to the Ford Motor company; the biggest tank factory to Chrysler; Merlin engines for the British, to Packard Motor company; the Pratt-Whitneys to the Buick, Chevrolet, Studebaker and Ford companies; while other defense contracts were allotted to the Hudson and Pontiac plants. Bethlehem Steel held $1,300,000,000 in contracts whose concealment became a part of the war strategy. This conversion of the automotive industry into a war industry during the short space of one year was typical of the innumerable other plants ranging in size from giant mills to humble garages.

The Time Problem.—The change from a peacetime to a wartime basis was a race against time by industrial management and labour. When France collapsed during the summer of 1940, the value of the output of the U.S. defense industries amounted to about $150,000,000 per month. Intensive and extensive plant expansion, coupled with the co-ordination of allied and interdependent industries and the utilization of small plants as well as highly skilled engineering talent, resulted in bringing the output of the defense industry to a total value of more than $1,850,000,000 for the year 1941. It was this historical achievement of 18 months that became the basis for the forecast of a monthly defense production by July 1942 of $4,600,000,000; *i.e.*, the anticipated two and a half-fold increase was founded upon the tenfold increase that had taken place in one and one-half years.

The Wages and Hours Problem.—The U.S. department of labour revealed that on Nov. 1 the average hours worked per week in the key defense industries had risen well above the popularly approved 40-hr. week. Labour was working 51·8 hr. per week in the machine tool industry; 50·4 in firearm manufacture; 46·9 in engine and machine making; 45·4 in shipbuilding; 45·2 in aircraft; 44·2 in munition making; 43·8 in electrical machinery; 43·0 in brass, bronze and copper; 42·4 in aluminum. The Pearl Harbor incident extended this average work week. With longer hours came higher pay per hour for labour. The department of labour reported increases in pay rolls and overtime premiums and average hourly earnings for factory workers on Dec. 1 of 77 cents per hour, the highest in 12 years. (*See* also LABOUR UNIONS; WAGES AND HOURS.)

The Priorities and Rationing Problem.—In earlier wars no priority problem was recognized because the concept of total war had not developed. The Office of Production Management at first, and later the Supply Priorities and Allocations board (and, in Jan. 1942, the War Production board) were set up to assure adequate supplies of materials for the successful prosecution of the war. Their orders intercepted the normal flow of raw materials to industry. The rationing system in automobile production laid off directly and indirectly 450,000 auto workers, plus 44,000 dealers and their 400,000 employees and salesmen. So acute did priorities unemployment become that relief appropriations of $300,000,000 became necessary. Repercussions of auto curtailment moved in many unforeseen directions, as, for example, the unexpected drop in high-grade municipal bonds secured by highway, bridge and tunnel tolls that sent some issues to record lows, and caused pleasure resorts to reef their sails for tourist trade. These unforeseen ramifications of priority orders disrupted industrial plans and led to widespread protestations by nondefense industries, which insisted that priorities should not demoralize but rather maintain the civilian economy. (*See* also PRIORITIES; PRODUCTION MANAGEMENT, OFFICE OF.)

The Small Business Problem.—Closely allied to the priorities problem confronting nondefense industries were the "small business" problems created by rationing, allotments of raw materials and concentration of governmental defense contracts. The Office of Production Management had called in army and navy officers who were familiar with military needs and were accustomed to deal with large and responsible firms. The tremendous increase in war orders by large industries had the effect of buying in advance unusually large inventories for army, navy and air defense needs, some of which could not be used for some time in the future because of the physical limits to plant capacity. It was this concentration of orders and setting aside of unused inventories that caused 150,000 small business men to protest in late summer and early autumn against the shortsighted industrial mobilization that caused the priorities unemployment of more than 4,000,000 on their pay rolls.

The Reconstruction Finance corporation undertook to make loans in participation with banks that would facilitate the readjustment of the productive processes of small businesses to meet wartime need. In recognition of this problem, the department of commerce set up a Small Business Unit designed to aid such proprietors. Special efforts were made late in 1941 to induce large firms holding great defense orders to subcontract part of their orders to small businesses. (*See* also DEFENSE, NATIONAL [U.S.].)

Industrial Groups.—*Iron and Steel.* Open-hearth, Bessemer and electric furnaces produced an estimated 82,927,557 tons of steel ingots and castings during 1941, nearly 25% more than during the previous peak attained in 1940, surpassing by 30% the output of 1929, and comparing favourably with the peak of 50,467,880 tons of 1917 in World War I. During 1941, the plants in the iron and steel industry operated on the average at 97·4% of capacity, compared with 82·1% in 1940 and 90·8% in 1917.

The proportion of the total output of steel designed for war purposes was relatively much less than the peacetime demands of the automotive and construction industries. The 1941 demand for heavy steel needed by motorized troops required a great increase in new ingot capacity. Because the industry was unwilling again to face a postwar era with a great burden of unused capacity, the national government undertook to finance 61% of the new pig iron capacity demanded for war.

Although strikes were fewer in 1941 than in the previous year, added numbers of unskilled workers tended to lower average efficiency, and the industry also suffered acutely from a lack of scrap. The importance of maximum production for war purposes caused the government to assist in removing the obstacles, but growing restriction and control reduced by one-third after May new orders for iron and steel. The year closed with backlogs of 5,000,000,000 tons, which exceeded four months of output at capacity. (*See* also IRON AND STEEL.)

Railroads.—Car loadings for 1941 totalled 42,300,000, 16% more than in 1940. Not only was a greater tonnage per train-load recorded, but freight was operated at faster speeds, locomotives were used more hours per day, switching hours were lengthened, car repairs were accelerated and surplus cars on sidings fell to a record low level. Total car loadings by commodities indicated that 2,600,000 cars had been needed for ore, an increase of 24·8% above the requirement for 1940. Coke required 23·5% more cars than in 1940; lumber and forest products, 21·4%; coal, 11·3%;

grain products, 10·2%; merchandise, 4·7%; miscellaneous requirements, 24·4%; but livestock needs were 5·1% less than for 1940. Freight traffic reached its lowest point in April 1941 and its peak in August. (*See* also RAILROADS.)

Automobile Transportation.—More than 90% of the U.S. passenger traffic in 1941 was carried by approximately 26,000,000 privately owned automobiles of the United States. Before automobile tire allotments and before the conversion of the auto industry into a part of the "arsenal of democracy," the U.S. public had begun spring advance buying of passenger automobiles. Using the years 1935–39 as a base of 100, increasing sales for the first five months of 1941 were as follows: January 143, February 178, March 215, April 235 and May 246—more than 100 above the opening of the year. The ebb tide set in with June at 214, July 169, August 91, September at 57, a new low, and the closing months ended in the practical disappearance of sales of new cars. (*See* also MOTOR VEHICLES.)

Bus Transportation.—There were about 4,794,965,000 revenue bus passengers carried in 1941, of whom more than 3,000,000,000 were city passengers and nearly 434,000,000 were intercity passengers. The 3,560 operating companies were paid for almost 2,189,000,000 bus-miles a total operating revenue of $529,000,000, three-fifths of which was obtained from intercity traffic and two-fifths from city and suburban traffic.

The average bus during 1941 carried 83,000 passengers, operated more than 37,900 mi., and constituted a part of a larger fleet that travelled 361,000 mi. and gave employment to 2·3 men per day at an average of $3,600 in annual wages. Manufacturers produced 7,961 buses during the year, and bus traffic on the whole increased about 11%. (*See* also MOTOR TRANSPORTATION.)

Air Transportation.—Air traffic rose from 3,100,000 passengers in 1940 to 4,500,000 in 1941, and mileage increased from 120,000,000 to 150,000,000—a distance equal to a round trip to the planet Mercury. Air express traffic grew from 14,100,000 lb. to 22,500,000 lb., while air mail climbed from 38,800,000 lb. to 45,500,000 lb. during the year. For the first time the roster of civilian pilots passed the 100,000 mark, an increase of 60% over 1940.

Gross revenues for all carriers subject to the interstate commerce commission aggregated $6,699,000,000, a 9·7% increase for 1941. The greatest percentage gain in revenue was made by the motor carriers of property, although trucks and vans hauled only 8% of the total intercity traffic in contrast with pipe lines, which carried 11%; inland waterways 19%; and railways 61%. (*See* also AVIATION, CIVIL.)

Building.—In 1940 total construction contracts amounted to approximately $4,003,000,000 and rose in 1941 to about $6,007,000,000, the highest since 1928. The most spectacular part of this increase occurred in new manufacturing plant capacity ($1,181,000,000) which was two and one-half times greater in 1941 than in 1940. Nonresidential building was 79% higher and reached $2,315,000,000. Residential contracts reached a total of $1,953,000,000, the largest since 1928. The department of labour reported that 615,000 new family dwelling units had been placed under construction in nonfarm areas during the year. Of these, about 515,000 were designed for single-family use, 33,000 for the use of two families and 67,000 for multifamily purposes. Approximately 16% were financed by the Federal Housing administration (*q.v.*), and about 73,000 of the 96,000 dwellings were built for occupancy for families connected with national defense efforts.

Heavy engineering contracts, chiefly for public works and for public utility construction, amounted to $1,738,000,000 in 1941, compared with $1,112,000,000 in 1940. The urban construction index declined for the first half of the year and slowly revived until December. Throughout the last half of the year priority rulings made the procurement of building hardware, nails, dimension lumber, heating and plumbing supplies very uncertain. (*See* also BUILDING AND BUILDING INDUSTRY; HOUSING.)

Petroleum.—Mechanized warfare placed a strain on both the distribution and production facilities of the U.S. oil industry. Tanker losses caused by submarine attacks rose rapidly, and the placement of coastwise tankers in transatlantic use caused an oil shortage on the east coast. Aviation demands for high-test octane gasoline and, in turn, high-grade crude oil, necessitated great changes in oil refining and in the relaxation of state laws restraining drillings. (*See* also PETROLEUM.)

Machine Tools.—The bottleneck of U.S. defense production in 1941 was the machine tool industry, an essential for metal working. Since the industry had keenly felt the effects of a decade-long depression, it was unprepared for the abrupt impact of war demands. Nevertheless, the production in 1941 exceeded $800,000,000, compared with $450,000,000 in 1940. About one-fourth of this output was exported to Great Britain, and 1941 closed with keen competition between domestic and export trade for the tools of mechanized warfare. (*See* also MACHINERY AND MACHINE TOOLS.)

Rubber.—About 800,000 tons of crude rubber, 250,000 tons of reclaimed rubber and 15,000 tons of synthetic rubber were used in the U.S. in 1941. Almost 97% of the crude rubber supplies came from areas in which hostilities began in December, but the advance buying of supplies by the Rubber Reserve corporation as early as 1939 tended to relieve, at least temporarily, the full effects of the war. About midyear the Office of Production Management limited the demand for rubber by producers of shoes, floor coverings, rubberized clothing, rubber bands and erasers, balloons, medical sundries and drugs, and at the close of 1941 it checked the sale of autos, tires and tubes. Huge governmental loans were made to leading rubber manufacturers to stimulate production of synthetic rubber on a commercial scale. (*See* also RUBBER AND RUBBER MANUFACTURE.)

Copper.—Mine production of recoverable copper aggregated 957,394 short tons, a total exceeded only by the war peak of 1916 and the boom year of 1929. The mine output was valued at $224,000,000, an increase of 13% over that of 1940. At the same time that copper prices remained relatively fixed, at about 12 cents per pound, the output continued to rise. Imports from South America and Mexico were greatly enlarged, and exports were the smallest since 1901. (*See* also COPPER.)

Company Earnings.—The quarterly reports of corporation profits compiled by the Federal Reserve Bank of New York for 167 industrial companies showed a total income of $288,700,000 for Dec. 1940, which dropped to $280,800,000 in March 1941, $270,300,000 in June and continued a downward trend through September. Standard and Poor's corporation index of industrial earnings for 119 companies indicated that earnings moved from 114·1 in Dec. 1940 to 113·0 in March, 111·8 in June and 109·5 in September. Taking into consideration the general trend in physical production, it became evident that the United States had obtained a larger output at smaller profits in 1941.

In contrast with the general profit trend, the net earnings of 13 chemical companies showed a definite improvement throughout the year, rising from $31,100,000 in Dec. 1940 to $34,500,000 in March and to $35,100,000 in June. A similar ascent appeared in telephone profits. Likewise, 13 petroleum companies reported an increase from $9,200,000 in December to $15,900,000 in June. Class I railways, according to the reports of the interstate commerce commission, had quarterly profits in Dec. 1940 reaching $124,500,000, followed by a downward plunge to $69,900,000 in March. A reversal of trend then began, and net earnings rose to $103,200,000 by June and continued to skyrocket until September quarterly reports showed these railway profits at $188,400,000.

These "spotty trends" were typical of corporate earnings taken as a whole in 1941.

From the yields of the Dow-Jones averages, it appeared that for the 30 industrials the earnings swung upward till May, subsided until August, then revived until the close of 1941. This same broken trend was shown for 20 rails, except that the high for the first half appeared in June, and the experience was repeated for the yield of 15 utilities whose high appeared in May. But for industrials, rails and utilities the maximum yields appeared in December, which fact was all the more remarkable when viewed in the light of growing price regulation, priorities, allotments of raw materials, higher corporate income and excess profits taxes, higher wages and operating costs, the uncertainties of future markets created by advance buying, and war operations.

Congress and the administration made definite efforts to keep profits down: first, to lessen labour unrest and thereby check demands for wage increases; second, to take the profit motive, or "blood-money," out of war; third, to protect taxpayers from paying abnormally high prices for war materials; fourth, to keep prices down for those goods that entered into the cost of living in order to retain the gains that the administration had achieved for labour through the social security program of previous years; fifth, because of the acceptance of the economic theory that production could be carried on without the incentive of profits; and sixth, to prevent the use of profits in competitive buying of scarce supplies with the government. These profit policies were used to justify wage increases and price controls. It became notoriously true that corporations with huge defense contracts were not making profits in 1941 on any substantial scale; for instance, the Chrysler corporation on its first $32,000,000 deliveries of defense products reported a profit of 1/25 of 1%.

Wholesale and Retail Trade.—Total retail sales for 1941 reached the extraordinary figure of $54,000,000,000, over $10,000,000,000 more than in 1940 and $6,000,000,000 above the total for 1929. Because voluntary co-operation of industry with the Office of Price Administration worked smoothly until autumn, and partly because of the retail price lag, those prices increased only about 8%, so that the actual exchange of real income of the U.S. showed an optimistic picture. In the latter half of 1941, when greater attention was given to priorities, rationing and allotments, with the drop in output of the nondefense industries, the rise in retail sales was more an indication of the fear of inflation than of rising standards of living. Although priorities appeared in aluminum and machine tools as early as February, no significant inroad on retail sales appeared until after the middle of the year. By the end of the year, retail sales definitely felt the effect of advance buying. Forcing out of the market the civilian demand for products using copper, brass, nickel, tungsten, magnesium, tin and steel had a depressing effect on the sale of household equipment, electrical supplies, aluminum and tinwares, kitchen utensils and hardware.

Buyers' runs began in sugar, women's hosiery and paper as early as August, despite the warnings that no unusual shortages justified such buying psychology.

Retail prices exhibited the smallest advance in December for any single month of 1941, but they had an annual movement upward of 15.3%, or 21.8% above the level of the period immediately preceding the outbreak of World War II in 1939. Despite these increases, retail prices closed the year below replacement costs. Piece goods had the largest percentage of increase, rising from 87.0 in Jan. 1941 to 105.9 at the end of the year. The most striking advance was that of cotton wash goods, which advanced from 103.4 to 132.0. Women's apparel ranked next, rising from 92.5 to 107.7; men's apparel advanced from 87.0 to 105.1; home furnishings from 95.7 to 110.2; furniture from 103.2 to 126.6; musical instruments from 53.7 to 65.7; luggage from 76.0 to 98.7; and china from 94.9 to 106.4. These variations were caused both by the falling value of the dollar and by the difference in demand and supply factors in each commodity market. Those industries competing with war industries for raw materials, and those selling directly to armed forces demonstrated the greatest differential price gains.

The volume of retail sales of department stores in 1941 showed a 17% increase over that for 1940; apparel stores, 14%; and food stores, 10% for the year. Sporting goods sales showed a 25% rise, while motor vehicle dealers confronted a 25% drop for November below that of the same month for 1940. The best sustained markets were found in the lumber, building-hardwares and heating equipment stores, where an increase of 20% over the volume of 1940 was maintained with remarkable steadiness throughout 1941.

The bureau of the census reported geographically the retail sales of independent stores for the first 11 months, and on this basis the sales in the state of Washington were ahead of 1940 by 26%; Connecticut, 24%; Ohio and Alabama, 23%; Arkansas, 21%. At the other extreme were Montana, whose retail sales had advanced only 7%; Florida, 8%; Idaho, 9%; and Nebraska, Nevada and New Jersey, 10% each. In general, the inventories in the eastern sections of the United States were somewhat below the national average, and the inventories in the western section were somewhat above.

While retail sales were increasing, the department stores were building up their inventories. During October the inventories on hand were three and one-half times the volume of sales for that month, taking the average for the country as a whole, compared with a ratio of two and three-quarters for Oct. 1940. Forward buying by consumers, department store buyers and the government was common practice. (*See* also CONSUMER CREDIT.)

Wholesale Trade.—Wholesale trade presented a more optimistic picture than did retail trade in 1941, according to the bureau of the census. For the first 11 months of 1941, wholesalers reported a gain of 31% in the volume of trade over that of 1940. The differential changes in retail trade were reflected in wholesale markets. The wholesale metal sales for 11 months for 1941 were 68% above those of 1940; industrial hardware, 67%; electrical goods, 64%; plumbing and heating supplies, 49%; and industrial chemicals, 46%. At the other end of the market, the wholesale trade in tobacco rose only 7%; dairy product sales were 11% higher; confectionery, 16%; drugs, 16%; and full-line grocery sales, 15%.

In general, wholesale collections were 27% better in 1941 than in 1940.

The pessimistic side of the wholesale picture appeared in October, when the rate of increase began to slow down; November sales were 14% below those of October—a greater seasonal drop than usual, but encouragement was found in the maintenance of November gains of 24% over those of the same month of 1940. With the outbreak of war in December, the month in which retail prices showed the smallest advance, wholesale prices, led by agricultural and chemical products, rose sharply.

Wholesale inventories were built up after June. Based upon a survey of 2,870 reporting firms, the stock on hand at the end of 1941 was about one-third higher than that for 1940. Inventories of manufacturers, wholesalers and retailers were estimated at $27,000,000,000 for December, or about $5,500,000,000 above those for the same month in 1940. Of this increase, manufacturers held $3,500,000,000, retailers approximately $1,125,000,000 and wholesalers about $750,000,000.

About one-third of this increase was caused by the price advance for the year, and the rest by net additions to supplies on

hand.

Chain Store and Mail-Order Sales.—Dollar sales of chain stores were maintained at an unusually high level throughout 1941. The largest relative gain occurred in men's wear chains, followed by grocery chains, the expansion for both exceeding by 25% the sales for 1940. Shoe store chain sales rose 18%, variety chain sales about 15%, while the smallest gains were made by the drug chains —about 9%. The department of commerce also estimated that the sales of general merchandise in small towns and rural areas in the autumn of 1941 were about one-third higher than for the last quarter of 1940.

The combined sales total for Montgomery Ward and company and Sears, Roebuck and company in 1941 was 26.5% ahead of 1940, while the Western Auto Supply company gained 31.3%. Early in the year there was a swollen demand for such lines as refrigerators, radios and tires, probably in anticipation of priorities. Reliable data of the 27 chains and mail-order houses recorded increased sales throughout the U.S. of about 20.6% for the year—a volume of $4,287,000,000, of which the two leading mail-order houses sold $1,622,000,000 and the 25 chains $2,665,000,000.

Commodity Prices.—The year 1941 opened with a growing fear of inflation. To combat this fear, the government moved in two directions: first, to control the general level of prices, and second, to control specific prices. Control over the general price level was effected, first, by the recapture of funds spent by the government for defense and distributed by increased employment, partly by means of taxation and partly by the sale of bonds; second, by increasing the reserve ratio of banks and thus checking their lending capacity.

Abnormal price increases causing fear of inflation could be found in certain instances. For example, the advance between Aug. 1939 and Aug. 1941 in the price of butter was 50%; lard, 79%; food fats, 100%; soap fats, 81%; drying oils, 30%; cotton-seed oil, 108%; overalls, 24%; and sheets, 25%. To control this trend, congress gave the price administrator legal power to enforce reasonable decisions as to price ceilings for specific commodities.

In the economic order a price increase is normally an invitation to increase the supply, but in war times it may become impossible to increase supplies, especially if the producer has the advantage of a monopoly, or whenever all known natural resources are being used to capacity, or finally when competition sets in between the government and civilian uses for limited supplies. Under such circumstances price does not perform its usual economic function in a capitalistic democracy, and governmental control over specific commodity prices becomes essential.

The weekly wholesale commodity price index in Table II, compiled by the National Fertilizer association, gave a clear understanding of the extent to which specific prices had increased during 1941.

Table II.—*Wholesale Commodity Price Changes in 1941*

(1935–39 = 100)

Group	Jan. 1942	Jan. 1941	Group	Jan. 1942	Jan. 1941
Foods	118.7	92.5	Textiles	147.7	112.9
Fats and oils	129.5	73.8	Metals	104.0	103.2
Cottonseed oil	156.4	74.7	Building materials	131.7	117.8
Farm products	129.1	96.3	Chemicals, drugs	120.1	103.0
Cotton	174.0	96.3	Fertilizer materials	117.0	106.0
Grains	119.1	87.6	Fertilizers	112.7	104.0
Livestock	122.5	97.8	Farm machinery	103.4	99.7
Fuels	113.0	101.5	All groups combined	121.5	101.1
Miscellaneous commodities	126.9	110.4			

In contrast with business and industry, agriculture had not benefited to an equal extent during 1940 from the preparedness program of that year, but with lend-lease spending, prices of farm products began to rise in 1941. Despite efforts on the part of the Office of Price Administration to bring farm prices under control, congressional resistance postponed such action until the end of 1941, and agricultural prices rose until it was estimated that the annual agricultural income for the year had reached a total of $11,200,000,000. (*See* also AGRICULTURE.)

Cost of Living.—The cost-of-living index issued by the National Industrial Conference board exhibited an uninterrupted increase from 86 in Jan. 1941 to 92.9 in November (on the basis of 1923 = 100). The average index of living costs stood at 84.5 for 1939, rose slightly to 85.3 for 1940, and approximated 89.4 in 1941. When these costs were broken down into the common elements of food, clothing and shelter, then a clearer picture showed that in Jan. 1941 the food index stood at 78.7 and by Nov. 1941 had risen to 92.2. Meanwhile, clothing began the year at 73.5 and rose to 79.6 by November, whereas housing opened the year at 87.6 and closed the month of November at 89.5. If fuel and light costs are added, the year 1941 showed that the U.S. citizen, on the average, paid 86.4 in Jan. 1941 for what he paid 90.2 in November, while that mysterious item in the cost of living known as "sundries," required 93.1 in January and demanded 101.9 for the same supply in November.

Federal steps to impose price ceilings were accelerated by the outbreak of the war, and attempts were immediately made to apply ceilings to a much wider variety of commodities. Maximum prices were reluctantly extended to later stages of production and in many instances covered retail prices of consumers' goods. A large number of price ceilings established earlier in 1941 were advanced, and premium price plans for extra production based upon quotas by the Price Administration were instituted to perform the normal function of price in stimulating production. (*See* also COST OF LIVING; PRICES.)

Securities and Banking.—New capital issues for 1941 exceeded the $1,000,000,000 mark, the highest level since 1937. Railroads, public utilities and telephone companies were securing funds for new equipment. Manufacturing companies sought capital through the sale of stock; the federal government needed funds for defense, while state and municipal governments continued their four-year-old policy of decreasing new issues and refunding old.

The price of high-grade bonds increased about two points between Jan. and Dec. 1941 and the price of stocks fell about eight points. During the first quarter of the year, stock prices held firm with news of increasing physical output, increased car loadings and rising wages, but dull spots were caused by strikes, British defeats and the dismal reports on the battle of the Atlantic. In March the spotlight turned from the stock to the commodity markets, where the full effect of the lend-lease funds began to be felt, and the stock market reflected that optimism. In April stock prices receded because of the threats of price and production control and the black news from southeastern Europe, which also exerted a prolonged influence through May. By June the declaration of an unlimited emergency by the president led to a belief that strikes would end, defense production would be speeded up, and industry protected; hence stock prices revived. July saw an optimism based on the startling strength of Russian armies, but August brought disappointing news on the "shoot first" order, and the vague peace appeals of the Atlantic charter. In the last quarter of 1941, the greatest tax-selling wave in ten years, growing alarm over corporate taxes, price controls without wage controls, and the anticipation of a prolonged war sent stock prices to the low for the year. (*See* also STOCKS AND BONDS.)

Banking.—In 1941 the volume of commercial paper outstanding reached the highest point in five years. Discount rates remained at the 1½% level, however, and the amount of money in circulation increased nearly 22% during the year—the highest on record and twice as high as for the prosperous era of the '20s. Instalment loans were curtailed during the summer, but throughout the year agricultural loans continued to remain the stable element in the banks co-operating with the Farm Credit administration. The credit inflation danger was lessened by the doubling of the reserve ratios within the maximum limits fixed by the Banking act of 1935, by the distribution of the New York reserves throughout the system, and by the heavy purchase of treasury paper. At the time of the attack on Pearl Harbor, the reserve banks were in a favourable position to carry on the financing needs of the government, and although the market needed no support at that time, the banks were in a position to aid government bonds in the same manner in which they supported the bond market when the war started in the fall of 1939. In general, bank earnings showed considerable improvement in 1941, for country banks as well as for reserve city banks. (*See* also BANKING; FEDERAL RESERVE SYSTEM.)

Bankruptcy.—According to Dun's *Statistical Review*, Jan. 1941 opened with a total of 1,124 industrial and commercial failures. In the ensuing six months, the total dropped until 970 business failures were reported for June. October registered a total of 735 bankruptcies, the lowest monthly total for the year. The trend in business failures during 1941 was distinctly favourable; the total approximated 11,771 compared with 13,619 for 1940, and 14,768 for 1939. Dun's insolvency index, adjusted for seasonal variations, showed a steady drop from 62.0 for Jan. 1941 to 55 for June, with a slight increase for the summer months and an uninterrupted drop to November of 46.1—the lowest point in five years.

THE VAGARIES of production and consumption are pictured in this cartoon of 1941 captioned "The Storm," by Herblock of NEA Service

Of all the businesses and industries that failed during 1941, 61.1% had liabilities of less than $5,000. At the other extreme, only seven failures in the United States had liabilities in excess of $1,000,000. In January, 92.1% of all failures had liabilities of less than $25,000, and 97.8% of the total number of failures had liabilities of less than $100,000. Taking the month of January as typical, since monthly distribution of trade failures presented no wide variations, 68% of all failures occurred in retail trade; 14% in mining and manufacturing; 8.5% in wholesale trade; 4.8% in the construction industry; and 3.8% in commercial service.

Legislation Affecting Business.—Treasury experts estimated that the corporate income tax of the Revenue act of 1941 would net an added $2,000,000,000. The 10% additional defense tax of 1940 was absorbed in the regular normal rate, and a corporate surtax of 6% was imposed on net incomes up to $25,000, and a tax of $1,500 plus 7% on net incomes in excess of $25,000. In addition, the law required corporations to pay an added 10% on each excess-profits bracket, beginning at 35% on adjusted excess profits not over $20,000, rising to 45% if over $50,000, 50% if over $100,000, 55% if over $250,000, and 60% if over $500,000. The law allowed a credit amounting to 125% of new capital invested, with certain limitations. Congress increased the capital stock rate from $1.10 to $1.25 for each $1,000 of adjusted declared value of capital stock. The defense excise tax rates which were originally intended to expire July 1, 1945, were made permanent by congress. Many rates were substantially increased, and new manufacturers' excise taxes of 10% were added on sporting goods, luggage, photographic supplies, electric signs, business and store machines, rubber goods, optical equipment, electrical appliances and many other industrial products. The increased estate and gift taxes had little direct effect on business. (*See* also TAXATION.)

In addition to increased national taxation, the several state legislatures revised revenue sources in 1941. Maryland added taxes on gross receipts, admissions and amusements. Seven states raised liquor taxes. Florida increased billboard and chain store taxes. Ohio added a new corporation licence tax. Eight states enacted use fuel taxes, eight others extended emergency gas tax rates, while four added permanently to their gas tax. State, individual and corporate income taxes were raised in Maryland, Massachusetts, Minnesota, North Dakota, West Virginia, Wisconsin and Pennsylvania. New York extended the temporary increase of 6% on corporate net incomes to 1942, but dropped the 1% emergency tax on personal incomes. Three states amended their tax laws to reach federal salaries. South Dakota substantially reduced the burden of the income tax; Iowa removed the chain store tax on units in villages; Texas exempted bona fide filling stations from the chain store tax.

New Jersey revised the railroad tax laws by imposing a flat rate of 3% on all property used for railroad purposes. Indiana reduced the rate of the gross income tax from 1% to ½%; Illinois raised severance taxes by imposing a tax of 3% on the value of oil produced; and Minnesota raised the occupation tax on iron ore. Cigarette taxes were increased in Oregon, Oklahoma and Illinois. Temporary utility taxes were extended in Ohio, New York, Pennsylvania, Illinois and Massachusetts.

Action taken in 1941 by administrative agencies exerted a detrimental effect on business equal to federal and state legislation. Thus, export-licence controls led the way on Jan. 10 for copper, brass, zinc, bronze, nickel and potash. Mandatory priorities by the Office of Production Management in February affected aluminum and machine tools. Executive orders for price control in April extended voluntary agreements for price ceilings until more than 100 commodities were affected by midsummer. Wages and hours orders of the National Labor Relations board (*q.v.*), the Mediation board and the Conciliation service adversely affected the business outlook. (*See* also LAW.)

U.S. Foreign Trade.—Dominating U.S. foreign trade in 1941 were the materials and policies of war. Normal foreign trade was influenced by the lend-lease policy, aid to the Allies, hemispheric unity, priorities control, the freezing of foreign funds, British blockade of continental markets, and the congressional addition of $500,000,000 to the capital of the Export-Import Bank of Washington (*q.v.*). After the outbreak of war with Japan, the government no longer disclosed the product, source or destination of shipments; hence reliable information was largely confined to the first half-year.

The total value of foreign trade, exports and imports combined, from January till June amounted to $3,597,000,000, 8% more than for the corresponding period of 1940, and exceeding by 30% the five-year average value of the 1936–40 period.

The drop in the rank of agricultural products was the most startling single fact of the half-year. Never before in U.S. history had agricultural products constituted but 9% of the total value of exports. Aircraft assumed first place in export trade with 13.9%, a gain of 105.1% over 1940. Following in the order of value of exports were automobiles, power-driven machinery, electrical machinery, steel ingots, iron and steel plate, agricultural machinery, coal and coke, lubricating oils and ammunition.

Table III.—U.S. Monthly Export-Import Trade, 1941 and 1940
(in millions)

Month	1941		1940		Gold imports movement	
	Exports	Imports	Exports	Imports	1940	1941
Jan.	$325.4	$288.6	$ 370.1	$242.0	$236.4	$134.2
Feb.	303.4	233.7	347.0	199.8	201.5	108.6
Mar.	357.6	267.8	351.3	216.7	159.8	118.6
Apr.	285.5	287.6	323.0	212.4	249.9	172.0
May	384.6	296.9	325.3	211.4	438.7	34.8
June	329.7	279.5	349.7	211.4	1,103.0	30.7
July	358.6	277.8	316.7	232.4	520.0	37.1
Aug.	455.4	282.6	350.9	220.2	351.5	37.0
Sept.	417.1	262.7	295.5	194.8	334.1	65.7
Oct.	..	..	343.8	206.9	326.0	40.4
Nov.	..	..	327.7	223.6	330.1	..
Dec.	..	..	322.3	253.1	137.2	..
Total	..	..	$4,023.3	$2,624.7	$395.7*	..

*Average.

Tropical foodstuffs and defense materials led the import trade for the first half-year. Rubber imports by June were 36% above the 1940 level and 85% above the five-year normal average of 1936–40. Crude rubber alone constituted 12.6% of the total value of imports, followed in turn by unmanufactured wool (7.5%), coffee (6.9%), cane sugar (5.9%) and tin (5.3%). Countries supplying the goods of greatest value were Canada ($236,000,000), British Malaya ($168,000,000), Netherlands Indies ($95,000,000), Cuba ($86,000,000), Brazil ($83,000,000), Argentina ($76,000,000), United Kingdom ($68,000,000) and Japan ($65,000,000).

The percentage increase in both export and import trade made the year 1941 unique. Compared with the first half-year of 1940, lead imports rose 4,891%; refined copper, 2,822%; unrefined copper, 1,029%; and tin, 539%. In the export trade, combustion engines rose 454%, condensed milk, 339%, firearms, 203%, pig iron, 228% and ammunition, 167%. Table III affords a reliable month-by-month trend and comparison of U.S. export and import trade for 1940 and 1941. (*See* also INTERNATIONAL TRADE.)

Business Conditions in Other Countries.—*Great Britain.* The war dominated the business situation throughout 1941. From the outbreak of war in Sept. 1939 to Sept. 1941, the British board of trade wholesale index rose about 57%, while the ministry of labour's cost of living index advanced 28%. The extension of governmental control over money, credit, production, consumption and the distribution of goods and incomes became a paramount business consideration.

The limitation of supplies orders in 1941 regulated retail sales by diverting production to war and to export trade, the means by which essential imported war materials were partly paid. Operating similarly to priorities in the United States, these orders were first used in June 1940 to restrict the sales by wholesalers and manufacturers to 66% of the value of normal trade in specified goods, for the period from June 6 to Nov. 30, 1940. These orders included clothing, toys, musical instruments, office appliances, cosmetics, toilet preparations, carpeting, pottery, luggage, cameras, jewellery, household appliances and supplies.

This list was increased by a renewal order on Dec. 1, 1940, that reduced quotas for many products from 66% to 50%, but were as low as 25% for metal products. Since these quotas were stated in terms of price, the effect of the price increases was a more than proportionate decrease in the volume of physical production. Not until the last quarter of 1941 was the full impact of these orders realized, because wholesalers and manufacturers had relied upon the "inventory cushion." But as these stocks vanished, the quotas became an arbitrary limit on replacements, and business generally began to experience the pinch of limitations. Nevertheless, the very existence of the "inventory cushion" tended to prevent a more abrupt increase in prices.

The index number of British security values showed two rather well defined trends; from 113.6 in Jan. 1941, the index fell to an April low of 112.4, thereafter rising steadily until November, when it closed at 117.8.

Efforts were focused on the expansion and protection of the shipbuilding industry, and the convoys of the pooled British and U.S. navies began to improve the safety of trade. The solution of the shipping problem was further aided by the formation of an anti-axis shipping pool, the shortening of the lines of supply, the elimination of unessential and bulky goods, and merchant shipbuilding in the U.S. At the close of 1941, about 43% of national industrial capacity was employed in war production.

Germany.—Statistical reliability of the data relative to business conditions in Germany and German-occupied Europe is questionable because of its military value to axis enemies, but probably 66% of the industrial capacity was engaged in war production. Statistics of 17 selected industries for Dec. 1941 show that the average of weekly working hours had been gradually rising. The great increase in the number of married women working only half-days or five days a week made the average working week for women about seven-eighths that of the men's 51-hr. week. Abrupt increases in industrial output occurred in supplies needed for the winter campaign in soviet Russia—primarily clothing, candles, oil lamps, stoves, skis and chemicals. Railways, overburdened with great increases in freight traffic, were compelled to reduce passenger schedules, to provide for heavier loadings, and to divert heavy traffic to inland waterways wherever possible. Production of substitutes such as synthetic oils, rubber and artificial textiles, definitely soared. Many industries of special wartime significance such as chemicals and aluminum were placed under governmental control and operation but not ownership. War taxes on tobacco and alcohol were raised, and the "iron savings" developed into a supplementary wage tax.

Economic warfare became an important phase of totalitarian war, and special attention was given to industrial collaboration with the occupied countries. Subcontracting with industries in occupied countries expanded in the summer of 1941, but in the last quarter of the year the industries of Belgium, Holland, France and Czechoslovakia were no longer guaranteed coal, iron and steel, while industry in occupied U.S.S.R. was officially at a standstill.

Collaboration with the "protectorates" on the continent consisted in economic reorganization of national economies, in turning over the management of mills and factories to German officials and workmen, in the mass migrations of skilled labourers from occupied countries into Germany, the deportation of Jews to agricultural areas, the importation of seized food reserves from occupied countries, and in the conversion of peacetime industries to war purposes of the reich. Two types of markets developed: the public market and the black market, founded on secret exchange. In certain public markets in Czechoslovakia eggs were reported to have sold during Nov. 1941 for 18 cents each, and butter, at $2.40 per pound. The reich pursued the policy of paying for necessary war imports by exporting Czech sugar.

Finland.—Finland faced an acute labour shortage in 1941 which prevented the export of paper and cellulose products to Germany to buy necessary food supplies. Shortages arose in iron, tin and cotton. A long summer drought and early frosts caused a dearth of winter supplies of food, fruits and vegetable products. The fat ration in Oct. 1941 dropped to 21 oz. of margarine weekly, and the weekly milk ration to 1 pt. per person. An abnormal scarcity of firewood, coal and coke required severe rationing, since only 30% of the normal fuel supply was available for the winter of 1941–42.

Belgium.—This country may be assumed to be typical of German-occupied Europe. Of about 1,500,000 industrial workers who were employed in 1939, roughly 210,000 were transported directly to Germany and about 190,000 were working in Belgian manufacturing plants converted to German use. Workers who refused to comply with requests for transference were discharged and denied unemployment relief. Steel plants lacked Swedish and French ores, and could not supply railways and shipbuilding yards with the manufactured products demanded by Germany. The Belgian textile industry operated at about 30% of prewar capacity. The glass industry was merged into the German cartel, and German control was extended over prices, banks, steel, food supplies, allocation of raw materials and factory orders by the ministry of economic affairs directed from Berlin.

Switzerland.—Severe drought resulted in an inadequate food supply for 1941. Since the warring nations could not part with ships for peacetime purposes, Switzerland was obliged to charter seven ships, flying its own flag, to import food from America. These ships unloaded at Genoa or Marseilles, where the German and Italian control commissions deducted 10% of all cargoes. The value of foreign trade in 1941 reached the highest level since 1937, though its volume was about 30% below that of 1938. For the first nine months of 1941, imports totalled 1,475,000,000 francs and exports about 1,093,000,000.

Coal shortages imposed a 50% restriction in its use, with 60° F. the legal indoor maximum. Hot-water supply was limited to one day every fortnight, and the use of electricity was restricted by water shortage.

(E. H. He.)

Butter. While production of other dairy products increased sharply in the United States in 1941, owing to huge federal government purchases of cheese and evaporated and dry milk for lend-lease export to Britain, butter production remained practically stationary. From March 15 to Dec. 1, the government bought only 65,787 lb. of butter, at a cost of $20,508. In contrast, the department of agriculture bought for lend-lease export in the same period 137,566,710 lb. of cheese, 32,419,520 lb. of dry skim milk, 2,575,500 lb. of dry whole milk and 13,570,430 cases of evaporated milk, all at a total f.o.b. cost of $81,152,159. (*See* Cheese; Dairying; Milk.) In addition, the department paid $199,786 for 1,786,250 lb. of oleo oil, largely used in making butter substitutes. As a result of this war-dominated market, whole milk that ordinarily would go into butter production was diverted to cheese factories and condenseries. Butter prices, however, were maintained at substantial levels by the Dairy Products Marketing association, an organization of co-operative dairies which draws financial support from the government. Supplies purchased by the department of agriculture, while predominantly for export, were available in 1941 for Red Cross and other relief purposes.

Oleomargarine.—Much more disturbing to the United States butter industry than any wartime changes in production and markets was the government's adoption of the McNutt standard for oleomargarine, which liberalized the formerly strict regulations governing the sale of this product and permitted the substitute to become a more formidable competitor. For 40 years or more the dairy industry had fought the competition from oleomargarine and had, until 1941, been generally successful in furthering legislation to curb the sales of butter substitutes. With the adoption of the new standard, oleomargarine may be fortified with vitamin A. It may be artificially coloured and flavoured to resemble butter. The oleomargarine manufacturers were quick to seize this opportunity to broaden their market and began a national advertising campaign. The dairy organizations, including such powerful farm and manufacturing groups as the National Co-operative Milk Producers federation, the National Dairy union and the American Butter institute, introduced various measures in congress to nullify the McNutt standard, among them a proposed law to put the oleomargarine industry under the jurisdiction of the department of agriculture. The McNutt standard is a regulation under the food and drugs act. Farm opposition to oleomargarine, however, did not have the practically undivided support of agricultural groups that it formerly had. Cotton-seed oil, instead of imported coco-nut oil, was the principal ingredient in oleomargarine, and many cotton growers in the south saw in the expanded sale of butter substitutes an advantageous outlet for cotton-seed oil.

Creamery Butter.—Production of creamery butter in the United States in the first 11 months of 1941 was 1,782,710,000 lb. compared with 1,709,668,000 lb. in the same period of 1940 and a ten-year (1930–39) average (for 11 months) of 1,572,600,000 lb. For the 12 months of 1940 production was 1,836,256,000 lb. The full year, 1941, production would be about the same as that of 1940 or slightly less, the department of agriculture estimated. Eleven months' butter production in Canada in 1941 was 273,507,255 lb., an 8.6% increase over the same period in 1940.

(S. O. R.)

Byram, Harry E. (1865–1941), U.S. railroad executive, was born Nov. 28 in Galesburg, Ill. In 1881 he worked as a call boy for the Chicago, Burlington and Quincy railroad. Twenty-nine years later he was vice-president of the C. B. & Q. In 1917 he was named president of the Chicago, Milwaukee and St. Paul railroad and was manager of the line during World War I when the government ran the nation's roads. He was chairman of the board of the Chicago, Milwaukee, St. Paul and Pacific from 1927 until his death Nov. 11 in Fairfield, Conn.

Byrnes, James Francis (1879–), U.S. jurist, was born May 2 in Charleston, S.C., of Irish parentage. At the age of 14 he left school to become office boy of a law firm. By studying stenography, he advanced to the position of court reporter. In 1910 he was elected to congress on the Democratic ticket and was re-elected six times, serving from 1911 to 1925. As a member of the deficiency committee during World War I he frequently met Franklin D. Roosevelt, then assistant secretary of the navy, with whom he formed a lasting friendship. In 1930 he was elected to the U.S. senate, and was re-elected in 1936. In June 1941 he was appointed associate justice of the U.S. supreme court by President Roosevelt. Generally considered a conservative, he followed, for the most part, the leadership of the president, although he opposed him on the supreme court reorganization plan.

Cabinet Members. The following members of President Roosevelt's cabinet held office on Jan. 1, 1942:

Post	*Name*	*State*
Secretary of State	Cordell Hull	Tennessee
Secretary of the Treasury	Henry Morgenthau, Jr.	New York
Secretary of War	Henry L. Stimson	New York
Attorney-General	Francis Biddle*	Pennsylvania
Postmaster General	Frank C. Walker	Pennsylvania
Secretary of the Navy	Frank Knox	Illinois
Secretary of the Interior	Harold L. Ickes	Illinois
Secretary of Agriculture	Claude R. Wickard	Indiana
Secretary of Commerce	Jesse H. Jones	Texas
Secretary of Labor	Frances Perkins	New York

*Sworn in Sept. 5, 1941 to succeed Robert H. Jackson

Great Britain.—At the close of 1941 the war cabinet was composed as follows:

Post	*Name*	*Party*
Prime Minister, First Lord of the Treasury and Minister of Defense	Winston Churchill	Conservative
Lord Privy Seal	C. R. Attlee	Labour
Lord President of the Council	Sir John Anderson	Conservative
Secretary of State for Foreign Affairs	Anthony Eden	Conservative
Minister without Portfolio	Arthur Greenwood	Labour
Minister of Supply	Lord Beaverbrook	Conservative
Chancellor of the Exchequer	Sir Kingsley Wood	Conservative
Minister of Labour and National Service	Ernest Bevin	Labour
Minister of State	Oliver Lyttelton	Conservative

For other ministers and members of the government *see* Government Departments and Bureaus.

Cacao: *see* Cocoa.

Cadmium. Little information was available on cadmium production outside of the United States, but it was probable that the 1941 output exceeded the 4,500 metric tons estimated as the world total in 1940. In the United States, production increased by 34% and sales by 20% in 1940 as compared with 1939; sales were 5% ahead of production, and consumption rose to a new record-high, at 6,951,300 lb. Imports declined to 27,491 lb., and 127,776 lb. was exported. (G. A. Ro.)

Caldecott Medal: *see* AMERICAN LIBRARY ASSOCIATION; CHILDREN'S BOOKS.

Calendar of Events, 1941: *see* pages 1–16.

California. A Pacific coast state of the United States, thirty-first state to enter the union (Sept. 9, 1850); popularly known as the "Golden state." Area: 156,803 sq.mi.; pop. (1940) 6,907,387 (1930: 5,677,251), a greater increase (21.7%) than in any other state. Japanese (racial origin) totalled 93,717 (73.8% of all in the U.S.), of whom 33,569 were alien foreign-born. In 1940, 71% of the population was urban. Capital, Sacramento (105,958). Other chief cities: Los Angeles (1,504,277); San Francisco (634,536); Oakland (302,163); San Diego (203,341); Long Beach (164,271); Berkeley (85,547); Glendale (82,582), Pasadena (81,864). Fifty other cities exceeded 10,000.

History.—Unprecedented industrial expansion and revolutionary changes in economy characterized California in 1941, as the state's resources were mobilized to meet the national emergency.

National defense highlighted the regular session of the legislature, which approved legislation creating a 30-man council to co-ordinate defense preparations of state and local government, heavily penalizing sabotage and subversive activities, and establishing a program designed to forestall disruption of economy by labour disturbances. A labour-sponsored anti-injunction bill and a "Little Wagner act" were defeated. An act outlawing secondary boycotts was passed over the veto of Gov. Culbert L. Olson (Dem.), but a referendum petition suspended it pending submission to the electorate in Nov. 1942. On the basis of the 1940 census, two new assembly districts were granted to Los Angeles county and one each was taken from San Francisco and Alameda; two congressional districts were added to southern California and a third to the central coast area.

Following the outbreak of war with Japan, coastal cities experienced frequent blackouts as unidentified planes were reported offshore. A special session of the legislature called to finance defense preparations granted only $1,000,000 of the $10,000,000 requested for the governor's emergency fund, but appointed a joint legislative committee to study defense needs in preparation for further appropriations in Jan. 1942.

Education.—For the 1941–43 biennium, $152,937,900 was allotted to public elementary and secondary schools. These had 1,195,024 pupils and 42,180 teachers in 1937–38 and a 1940–41 average daily attendance of 1,048,150. In 1940–41 the University of California (state support 1941–43: $21,241,334) had 29,235 regular students and 5,298 instructors (3,022 full-time), and the seven state colleges (support: $5,984,235) 11,559 students and 544 full-time instructors. There were 102 institutions of higher education, with 8,749 full-time instructors in 1937–38, and 86,372 undergraduates and 6,695 graduates in residence.

Charities and Correction.—The industrial upsurge enabled a reduction of the state relief appropriation from $77,364,000 for 1939–41 to $3,790,000 for 1941–43. On May 30, 1941 the total case load was 31,431 (involving 110,163 persons), compared with 72,731 cases and 228,375 persons at the end of May 1940. During the fiscal year 1940–41, federal, state and county contributions to the aged (156,300 persons) totalled $68,478,527; 42,533 dependent children received $10,000,083, and 7,346 blind persons $4,204,767. The state maintained seven hospitals for the insane and two homes for mental defectives (est. average patients 1941–42: 26,903), and four prisons (average inmates 1940–41: 8,117).

Finance and Banking.—The 1941–43 state budget, including special appropriations, was $521,297,039 (1939–41: $566,056,899), of which $290,720,244 represented subventions to local government, including $162,378,251 for education. State tax collections during the fiscal year 1940–41 were $361,500,000, of which $109,233,972 was derived from the sales tax. The general fund deficit was $40,000,000 on June 30, 1941 (June 30, 1940: $82,110,559); estimated general fund revenues of $408,224,000 for 1941–43 were expected to result in a $50,000,000 surplus on June 30, 1943. Net bonded debt was $158,906,013 on June 30, 1941. On Sept. 24, 1941 there were 225 banks (129 state, 96 national), with deposits of $4,651,386,000, investments of $1,937,931,000, and loans of $2,170,735,000. Bank debits at 15 principal cities increased 20.3% in 1941, to $38,893,286,000.

Communication.—In 1940 there were 14,088 mi. of steam and 2,768 mi. of electric railways. Rural public roads in 1937 aggregated 99,560 mi., city streets approximately 18,209 mi., of which 52,632 mi. were surfaced. In 1940 California had more motor vehicles than any other state (2,990,262, or one for each 2.3 persons). Business telephones numbered 667,010 (27.87% more than in 1935); residential, 1,056,147 (39.15% more).

Agriculture.—Gross farm income in 1941 was $850,672,000, an all-time high, 26.5% over 1940 and 11% over 1929; the increase resulted principally from higher prices. Field crops (production 9,630,190 tons) were valued at $215,861,000; fruit and nuts (6,373,000 tons) $240,827,000, and vegetables and melons $105,881,000.

In 1940 there were 132,658 farms, aggregating 30,524,324 ac. (12,894,974 ac. available for crops), and valued at $2,166,452,648. The total value of livestock on Jan. 1, 1941 was $187,917,000.

Principal Agricultural Products of California, 1941

Crop	Unit	Production, 1941	Value, 1941
Oranges	boxes	47,284,000	$99,070,000
All tame hay	tons	4,588,000	53,680,000
Grapes	tons	2,411,000	40,585,000
Cotton (lint)	bales	410,000	35,324,000
Lettuce	crates	14,732,000	26,645,000
Beans (dry)	lb.	513,900,000	20,110,000
Peaches	bu.	22,252,000	22,401,000
Barley	bu.	25,529,000	18,381,000
Tomatoes	tons	746,700	18,331,000
Potatoes	bu.	20,951,000	17,250,000

Manufacturing.—Demand for war materials spurred California's manufacturing activity to new high levels in 1941. The number of factory employees increased 59%; payrolls nearly doubled, with average earnings rising about 25%. Factories producing essential war materials employed some 360,000 workers at the end of 1941.

Major defense contract awards and allocations to California during the 17-month period June 1940–Oct. 1941 totalled approximately $3,655,092,000, 11.9% of the national total, exceeding awards to the second highest state (New York) by more than $1,000,000,000. Of this amount, $1,879,810,550 was for aircraft production, $1,082,000,000 for shipbuilding, and $202,656,095 for construction of industrial plant facilities (principally aircraft and shipbuilding plants). In 1939, California manufacturers of aircraft and their parts (including aircraft engines) produced some $89,327,595 worth of products, and employed an average of 23,286 workers, who received $38,454,453. On Sept. 1, 1941 the seven largest of the state's 24 aircraft manufacturing firms had 127,206 employees; they received $1,435,287,931 of published U.S. contracts from June 1940 to Oct. 1941, at which time their reported backlog of unfilled orders was $2,600,764,622. Shipping contracts in the state between Sept. 1939 and July 1941 called for 292 vessels valued at $1,028,063,152. San Diego was an important centre of the aircraft industry and of naval activity.

In 1939, before the impact of war demands on state economy, there were 12,329 industrial establishments, with 275,477 workers receiving wages of $365,114,000, and with products valued at $2,798,180,000. Chief industries (with value of products) were: food and kindred products ($897,762,000); products of petroleum and coal ($397,207,000); iron, steel and products (except machinery) ($208,258,000); chemicals and allied products ($167,529,000); printing and publishing ($138,860,000); automobiles and automobile equipment ($119,428,000); non-automotive transportation equipment ($106,256,000); non-electrical machinery ($102,643,000); apparel and other finished products ($97,721,000); lumber and timber basic products ($87,193,000).

Mineral Production.—Production in 1940 was valued at $342,825,817 (1939: $352,462,564), of which petroleum, with a production of 223,294,805 bbl., accounted for $207,479,800 and natural gas (output 352,871,945 m.cu.ft.) $20,618,893. Metals were valued at $59,949,838, structural materials $34,739,319, salines $13,674,519, and industrial materials $6,357,748. Chief metals, with 1940 production and value, were: gold, 1,455,671 fine oz. ($50,948,485); quicksilver, 18,907 flasks of 76 lb. ($3,209,754); tungsten, 1,784 tons (60% WO_3 concentrate) ($2,267,135); silver, 2,359,776 fine oz. ($1,678,063); copper, 12,833,363 lb. ($1,450,170); lead, 3,092,636 lb. ($154,632); platinum metals, 1,358 fine oz. ($62,419); chromite, 2,599 tons ($32,796); zinc, 182,088 lb. ($11,472); antimony, 58,845 lb. ($7,958).

BIBLIOGRAPHY.—Charles Edward Chapman, *A History of California: The Spanish Period* (1921); Robert Glass Cleland, *A History of California: The American Period* (1922); John Walton Caughey, *California* (1940). (R. H. SH.)

California, University of. An institution of higher learning at Berkeley, Calif. Because of its size and the scope of its activities, this institution was greatly influenced by national defense needs during 1941. A defense council of 50 faculty members was organized. A series of defense industry training courses was established, primarily for the aeroplane and shipbuilding industries, and approximately 4,000 men and women were given training by Sept. 1941. Efforts were also made to interpret the world situation for the general public by means of public lectures in all parts of the state.

A greater appreciation of U.S. civilization was fostered among students by the inauguration of lecture courses on the Berkeley and Los Angeles campuses and by an extensive citizenship program introduced in the fall of 1941. Approximately 150 members of the faculty were given leave of absence for service in the armed forces or for defense research projects. The university's oceanographical research ship, "E. W. Scripps," was loaned to the U.S. navy for the duration. The regents of the university adopted a policy of investing endowment funds in U.S. defense bonds as rapidly as government regulations would permit.

The university decided in 1941 to award a new degree, Associate in Arts, to all students satisfactorily completing the first two years of their university course. Also, students were no longer to be penalized for poor scholarship in one course by subtraction of grade-point credit earned in other courses, but they were to be held more strictly to the "C" average minimum for continued residence on campus.

At the request of the university, the state legislature and the governor made appropriations of $2,500,000 for the construction of a $2,000,000 hospital addition to the medical centre in San Francisco and for the construction of facilities for a school of veterinary medicine in the college of agriculture. During "Charter week," gifts to the university totalling $2,750,000 were announced. As a result of defense calls and unsettled conditions, registration dropped approximately 10% in 1941. Registration of full-time resident students amounted to 28,485 for the academic year 1940–41. Volumes in the libraries increased to 1,873,564. (R. G. S.)

Camacho, Manuel Avila: *see* AVILA CAMACHO, MANUEL.

Cambodia: *see* FRENCH COLONIAL EMPIRE.

Cambridge University. A British university at Cambridge, England. In the Michaelmas term 1941 there were 2,756 men and 515 women *in statu pupillari;* the number of students evacuated from London was 1,756. There were ten professorial chairs vacant by death or retirement, but university elections were suspended till more suitable times. The customary conferment of honorary degrees was also suspended. Despite diminished numbers, accommodation was strained because of the housing of government departments and other war requirements. Building and reconstruction had ceased, and the formal opening of the Austin wing of the Cavendish laboratory was deferred. As the government grant was undiminished, the financial position was steady.

The senior training corps for the army was expanded, and the air squadron was reconstituted so that students were receiving training during their residence. Few men, however, stayed beyond their second year; and membership in one of these bodies was a condition of deferment of service. College social life continued with vigour and students' societies flourished.

BIBLIOGRAPHY.—*Cambridge University Reporter,* vol. 72; *Cambridge Review,* vol. 62. (C. Fo.)

Cameroons: *see* BRITISH WEST AFRICA; FRENCH COLONIAL EMPIRE.

Campbell, Sir Gerald (1879–), British diplomat, was educated at Trinity college, Cambridge. He entered the consular service in 1906 and was vice-consul at Rio de Janeiro, 1907. He served later in the Belgian Congo and at Venice, and was consul at Addis Ababa, 1915–19. After World War I he was sent to the U.S., acting as British consul-general first in Philadelphia, then in San Francisco, and, from 1931 to 1938, in New York city. He was knighted in 1934 and was high commissioner for the United Kingdom in Canada, 1938–41. In Jan. 1941, Lord Halifax (*q.v.*), British ambassador to Washington, appointed him minister to the U.S. For the first time in history, Great Britain had an ambassador, Lord Halifax, and two ministers, Nevile Butler and Sir Gerald Campbell, in Washington.

In June 1941, he resigned to become director-general of the British information service in the U.S.

Camp Fire Girls. During 1941, Camp Fire Girls were in training to serve their country both in peace and in war. Emphasis in 1941 was placed on understanding and appreciating the privileges and responsibilities of democracy. A special project was planned for Camp Fire Girls that would engender appreciation of the contributions of many countries to make the United States culture. This was called Treasure Trails—the girls being encouraged to explore the treasure trails of art which led from all the nations of the world to the United States. In their own towns they became better acquainted with the opportunities for art appreciation—the museums, concerts, clubs, public exhibitions and private art collections that might, if they knew how to use them to advantage, enrich their lives.

Believing that the strength of the nation is dependent upon the health and strength of the family, Camp Fire Girls launched a project based on their home craft program in the fall of 1941. Careful planning of meals for their nutritional value, wise marketing and appetizing preparation of food were stressed. The girls practised on "a dinner for a dollar for a family of four."

The majority of Camp Fire groups participated in the celebration of the 150th anniversary of the adoption of the Bill of Rights. (Camp Fire membership grew to 320,236 during 1941.)

At the meeting of the National council in Detroit, Mich., in Oct. 1941, resolutions were passed calling upon Camp Fire leaders to help each girl develop her best and most helpful potentialities in order that she might be a happy and useful member of society. In December, a specific "Service for Victory" program was drawn up. The Honourable Franklin D. Roosevelt was in 1941 honorary president of Camp Fire Girls and Mrs. Roosevelt was honorary chairman of the advisory committee. The other officers were: Mrs. Elbert Williams, president; Lester F. Scott, national executive; and Ward L. Johnson, treasurer. Lady (Walter) Hearn is president of British Camp Fire Girls. (C. F. Lo.)

Campinchi, César (1882–1941), French statesman and lawyer, was born May 4 at Calcatoggio, Corsica. He studied law in Paris and was admitted to the bar in 1907. After serving in World War I, during which he had been seriously wounded, he returned to law and swiftly rose to fame as one of the most brilliant criminal lawyers in France. Known for his sharp tongue and acid wit, Campinchi participated in a score of famous cases, and French courtrooms were always packed when he pleaded. He entered politics in 1930 and two years later he was elected deputy from Bastia. He rose to leadership of the Radical Socialist party in 1936 and was subsequently appointed navy minister by Daladier, a post he retained until the collapse of France in June 1940. After the Franco-German armistice, the French nationalist press demanded the arrest of Campinchi on charges that he was one of those responsible for leading France into a war for which she was not prepared. But the government took no action and Campinchi lived in retirement in Marseilles, where he died Feb. 23.

Canada, Dominion of. A dominion of the British Commonwealth of Nations (Statute of Westminster, 1931, 22. Geo. V.c.4.) covering all the portion of

North America north of the United States, except Newfoundland, Labrador and Alaska. The dominion is a federal union of nine provinces united under the terms of the (imperial) British North America act of 1867—Ontario, Quebec, Nova Scotia and New Brunswick in 1867, Manitoba 1870, British Columbia 1871, Prince Edward Island 1873, Alberta and Saskatchewan 1905. Outside the provincial boundaries, the Yukon and Northwest Territories are under the federal government. There is no statutory national flag; in most common use is the Red Ensign with the dominion coat of arms in the field; the union jack, usual on public buildings and permitted elsewhere; the other ensigns as under the king's regulations. In French Canada the French tricolour is also unofficially flown. Area, 3,729,665 sq.mi.; pop. (1941) 11,419,896. Capital, Ottawa (pop. 150,861). Montreal is the largest city (city proper 882,398). Provincial capitals in the order of the provinces listed above are Toronto (city limits 657,612); Quebec (147,002); Halifax (69,326); Fredericton (9,905); Winnipeg (217,994); Victoria (41,787); Charlottetown (15,049); Edmonton (92,404); Regina (56,520). Other leading cities are Vancouver (271,597); Hamilton (164,719); St. John, N.B. (50,084); Kingston (29,545); Fort William (30,370); Port Arthur (24,217); Saskatoon (42,269).

There is no state religion nor established church, but the privileges of religious minorities and the status of the Roman Catholic Church are safeguarded by the terms of federation. The census of 1931 recognized 34 groups, of which the chief were Roman Catholic, 4,285,388; United Church, 2,017,375; Anglican, 1,635,615; Presbyterian, 870,728; Baptist, 443,341; Lutheran, 394,194; Greek Orthodox, 102,389; Jewish, 155,614; Mennonite, 88,736.

The governor general in 1941 was the earl of Athlone (*q.v.*); prime minister, William Lyon Mackenzie King (*q.v.*). The house of commons is elected; the senate is appointed.

History.—The dominion government continued during 1941 under the leadership of Mackenzie King and the Liberal party, re-elected March 26, 1940. On the resignation of R. B. Hanson, the National Committee of the Conservative party in November invited the Rt. Hon. Arthur Meighen (*q.v.*) to lead the opposition. Meighen, in accepting the post, urged conscription for service overseas. King, in a speech to the house of commons Nov. 12 announced that "without any consultation of the people on that subject, I do not intend to take the responsibility of supporting any policy of conscription for service overseas." The session of parliament which began in 1940 carried on till June 14, 1941. Parliament reassembled on Nov. 4 and adjourned Nov. 14 until Jan. 21, 1942.

In provincial politics, general elections were held in October in both British Columbia and Nova Scotia. In Nova Scotia, the government of A. S. Macmillan (Liberal) was sustained (23 out of 30 seats). He had succeeded to office in 1940 when the premier, Angus Macdonald, resigned to accept the portfolio of minister of naval defense in the federal cabinet. The result in British Columbia showed a lack of a clear majority which led to the formation of a coalition government with John Hart as premier.

In March a coalition government was formed by Premier Bracken of Manitoba, who had won 51 out of the 55 seats in the general election held in April 1940. Among the federal cabinet changes in 1941 were: the appointment of J. T. Thorsen as minister of national war services in June; that of L. S. St. Laurent as minister of justice, Dec. 11 (on the death of Sir Ernest Lapointe); Humphrey Mitchell, minister of labour, Dec. 15; N. A. McLarty, secretary of state. In the diplomatic field, Leighton G. McCarthy was appointed minister to Washington (Feb. 25) to succeed Loring Christie (*q.v.*), who resigned because of illness in February and later died (April 8). In July John D. Kearney was appointed Canadian high commissioner to Eire to succeed the late John Hally Kelly. In February Malcolm Macdonald was appointed high commissioner to Canada, *vice* Sir Gerald Campbell, who was appointed to the British embassy at Washington; C. J. Burchell, to Newfoundland (July); Jean Desy to Brazil; former Chief Justice W. F. A. Turgeon became the first minister of Canada to Argentina in September.

It was announced in November that Major Gen. Victor W. Oldum, commander of the 2nd division overseas, had been named Canadian high commissioner to Australia. Major Gen. H. D. G. Crerar (*q.v.*), previously chief of the Canadian general staff, went overseas to command the division. In November it was also made known that Rear Adm. Percy W. Nelles, chief of naval staff, had been made a vice-admiral, the first Canadian ever to be given this rank. On Dec. 15 Wing Commander Ernest A. NcNab was appointed liaison officer between the royal Canadian air force and the United States army air corps on the west coast.

Various other appointments during the year included that of R. C. Berkinshaw in February as director-general of the priorities branch of munitions department to control allocation of war supplies and transport. In April J. S. McLean joined the British Purchasing commission in Washington. In September Morris Wilson, president of the Royal Bank of Canada, was named chairman of the British Supply council in New York city, succeeding Arthur Purvis who tragically lost his life returning by plane from England. E. P. Taylor of Toronto was appointed chief executive officer of the same council in September. During the year a number of Canadian officials visited Britain by aeroplane, including the prime minister (Aug. 20, his first air flight), Messrs. Howe, Power and Macdonald of the cabinet, Adm. Nelles and Col. George Drew, leader of the Conservative opposition in Ontario. A group of newspaper men went to England (November) as guests of the British press.

Wendell Willkie (*q.v.*) visited Canada during March and spoke in both Toronto and Montreal on behalf of the campaign to raise funds for the National Auxiliary War services. The duke of Kent visited Canada and the United States in August, arriving by bomber July 29 and returning early in September. He flew some 15,000 mi., made an extensive inspection of the British commonwealth air training and visited U.S. aircraft factories.

Of interest to Canadians was the honour bestowed upon the former prime minister, R. B. Bennett, who was made a viscount in the honours list of King George VI's birthday, June 12.

Canada and the United States.—On March 19 Prime Minister Mackenzie King and J. Pierrepont Moffat, United States minister to Canada, signed a Canadian-U.S. agreement on the co-operative development and utilization of the Great Lakes-St. Lawrence river basin for the national defense of both countries. The estimated cost of this plan was $266,170,000 (the United States share, approximately $206,000,000) and provided for the deepening and developing of the river system, additional hydroelectric power and navigation facilities. It was expected that the scheme would be completed by 1945, a prospect entirely altered by the entry of the U.S. into the war.

At the same time the Canadian-U.S. Joint Defense board announced the completion of plans for the military and naval defense of the Atlantic and Pacific coasts of both countries. Earlier in the year (Feb. 15) Mr. Power, minister of air, said that on the recommendation of the Joint Defense board, the Canadian government was to build a chain of air-defense bases through Alberta and British Columbia to Alaska. There would be four intermediate bases between Edmonton and White Horse, viz.: Grande Prairie, Fort St. John, Fort Nelson and Watson lake. Vancouver would be connected to Fort St. John by bases in Kamloops, Wil-

liams lake and Prince George, with an additional aerodrome at Prince Rupert. The cost of the operation would be about $9,000,000.

In March an agreement was reached between the United States and Canada to build and arm vessels in the Great Lakes yards, the vessels to be promptly removed as soon as completed. Many manifestations of the co-operation of the United States and Canada were shown throughout the year. A number of meetings of the Canadian-U.S. Joint Defense board were held, with Mayor Fiorello La Guardia (*q.v.*) as co-chairman. In August a 236-mi. oil pipe line was welded at Highwater, Que., at an international ceremony. This pipe line was completed in the fall from Portland, Me., to Montreal. On Nov. 1, a new international bridge, the Rainbow bridge, over Niagara, was opened.

During 1941, Prime Minister Mackenzie King made three important visits to the president of the United States, in March, April and at the end of October. After the April meeting the "Hyde Park agreement" was announced—a joint statement on hemisphere defense and aid to Britain and the democracies, each country to provide the other with the defense materials it was best able to produce quickly. Canada was to supply the United States with from $200,000,000 to $300,000,000 of strategic materials: aluminum, nickel and other supplies. The United States was to pay Canada with U.S. dollars, thus strengthening Canadian foreign exchange. Moreover, Canada was not to pay for that portion of defense material purchased in the United States which consisted of unfinished war products for Britain, as this was to come under the lend-lease act for aid for Britain.

Labour.—The unemployment insurance scheme went into effect July 1, 1941, 105,084 Canadian employers having requisitioned 2,295,877 books for employees. The governing commission estimated that, in all, 2,500,000 workers would come within provision of the act setting up the organization to collect contributions from employers and employees and pay benefits to employees who lose employment.

Strikes.—In May the federal government undertook further steps to prevent the stoppage of work in industries with war contracts, by extending to them the terms of the industrial disputes act of 1907 (delay till arbitration is tried). Slow-down strikes in the coal mines at Glace Bay, N.S., after much loss of production, ended in resumption of work. A five-day strike at Arvida (P.Q.) (July 29), which led to the calling in of troops, was settled by arbitration. A strike of 4,000 employees at St. Catherines, Ont. (Sept. 11) and one at the Kirkland lake gold mines, were all settled finally by arbitration.

The year came to a fitting close with the visit of Winston Churchill (*q.v.*) to Ottawa (Dec. 29). An unparalleled ovation which greeted him and his address before an unofficial gathering of members of the parliament of Canada assembled in the senate chamber, in which he especially denounced the Vichy government, breathed defiance to the enemy and confidence in victory.

(S. LEA.)

Canada at War.—At the opening of 1941 Canada had been at war with Germany since Sept. 10, 1939 and with Italy since June 10, 1940. Participation in the war had met with universal approval, although conscription for overseas was, with equal unanimity, held as yet unnecessary. During this period of 15 months, the dominion had sent overseas some 90,000 men, had adopted an act for compulsory home service, and had initiated the commonwealth air-training plan. In addition, a wide program of manufacture of munitions, war equipment and fighting planes had been undertaken. In point of finance Canada had spent $2,183,000,000 (aid to Britain included), partly defrayed by increased taxation, partly by loans. Reports of war casualties up to the beginning of 1941 showed 736 killed, 285 died, 345 wounded and 195 missing. On Nov. 26, 1941, the total of dead and missing was 2,335 (navy, 408; army, 893; air force, 1,034).

Voluntary enlistments for service anywhere were as follows: navy, more than 27,000; army, more than 240,000; air force, more than 93,000; total, 360,000. The number who had volunteered to serve anywhere was more than 500,000. Of those enlisted for service in Canada, members of the reserve army liable to be called out for home defense numbered more than 145,000; men conscripted for the duration of the war for service in Canada numbered more than 150,000.

Compulsory military training was introduced in June 1940 under the authority of the National Resources Mobilization act. All single men and widowers without children, aged 19 to 45, are liable for military service in Canada. The first group to be given 30 days' basic training under the authority of this act went to camp in Oct. 1940. In the succeeding months, about 87,000 men were called up. About 20,000 of these joined the active forces; the rest were posted to the reserve army for part-time training. In Feb. 1941, the period of preliminary training was increased to four months; in March, the first four-month class went to camp; and shortly afterward it was announced that "conscripts" would be kept indefinitely in the army. At the end of 1941, the Canadian "draft" was calling up the 21–24 age group.

Students attending universities were exempt from the draft but had to take military training under a government-approved universities' training plan. A committee of the War Legion Services, Inc., under the chairmanship of Lieut.-Col. Wilfrid Bovey instituted a complete interprovincial bilingual school system available to the men in all services. The department of national war services was recruiting women for auxiliary service with the army and the air force to do administrative work, light transport driving and the like, to release men for combatant duty.

When the royal Canadian navy went into action in Sept. 1939, it mustered 15 vessels, 6 of them destroyers. By the end of 1941, the Canadian navy had increased its strength in ships to something over 300. By March 1942 it was expected that Canada would have a navy of 400 ships. The royal Canadian navy had played a very important part in the convoying of Canadian and U.S. supplies to Britain. So far as freight convoys were concerned, no fewer than 7,000 ships had left Canadian shores for Great Britain by Dec. 1941, and had carried 42,500,000 tons of cargo.

Ships and men of the navy co-operated with the royal navy in many parts of the world. Early in the war they helped to convoy Australian troop ships to battle areas. They operated off the French coast during the evacuation in June 1940. Canadians did notable work at Boulogne and Dunkirk, and later in the evacuation of Greece and Crete. In the waters around the British Isles, Canadian destroyers and corvettes played their part in protecting the approaches to the islands. Early in 1941 a Canadian destroyer helped rescue 857 survivors from the "Arandora Star" after it had been torpedoed. In the south Atlantic and in the Pacific the navy helped to implement a blockade on enemy ships; it captured five enemy vessels and caused others to be scuttled. Late in Nov. 1941 it was announced that two Canadian corvettes had sunk a German submarine in the north Atlantic. The corvettes picked up 47 survivors. The navy also successfully protected Canadian shores and ports. Its ships patrolled the dominion coasts (5,000 mi. of mainland and island coast line on the Pacific coast alone) day and night.

Of the Canadian active army force of more than 240,000 volunteers at the end of 1941, about half were overseas. Some were in Newfoundland, the British West Indies, Gibraltar and Hongkong; and a large number were in Great Britain. The final contingent of the 5th (armoured) division arrived in England late in November. Canada then had in Britain the 1st, 2nd, 3rd and 5th (armoured) divisions, a tank brigade and a large force of ancillary troops. In Sept. 1941 Canadian troops, together with British and Norwegians under Canadian command, effected a landing at Spitsbergen. No enemy interference was encountered.

Canadian airmen had been engaged in combat since the outbreak of war. Many had joined the R.A.F. before war broke out, and others followed in late 1939 and early 1940. The first R.C.A.F. squadron arrived in Britain early in 1940; it was followed shortly thereafter by two other squadrons. The flow of Canadian airmen from the British commonwealth air training plan in late 1940 and in 1941 steadily increased the number of R.C.A.F. fliers at the battle front. R.C.A.F. fliers, after completing their operational training overseas, were posted either to the R.A.F. or to an R.C.A.F. squadron operating under R.A.F. command. Twenty-five of these squadrons were in action by Dec. 1941, over Britain, Europe, the Mediterranean area and Russia. For military reasons much detailed information concerning their activities was not available. The following facts, however, were known:

The "All-Canadian" squadron of the R.A.F., formed late in 1939 of Canadian and British pilots, destroyed at least 30 planes over France and the Low Countries during the battle of France in 1940 and had the honour of being the last squadron to leave French soil. It fought over Dunkirk and played its part in protecting the evacuation of British and Allied troops. It also fought over London during the September "blitz." By Jan. 1941 it had accounted for more than 100 planes. One of the first R.C.A.F. fighter squadrons to see action had an equally distinguished record. It shot down 12 enemy planes in its first 19 days of action and was credited with nearly 100 by Dec. 1941.

During the last six months of 1941, Canadian fliers took part in R.A.F. daylight sweeps over Germany and the Low Countries. They bombed Berlin and carried out attacks on the German warships "Gneisenau" and "Scharnhorst." Two Canadian squadrons were assigned to night fighting duties, and others were on coastal patrol work and attached to both the fighter and bomber commands.

The close of the year brought news of the tragic but heroic defense of Hongkong, in which two Canadian units—the Quebec Royal Rifles, mostly recruited in the eastern townships and New Brunswick, and the Winnipeg Grenadiers—played a conspicuous part.

The finance of the war was carried forward in 1941 on the same general plan as in 1940 but with even greater increase of taxation and large public loans. It was estimated that war expenditures, including financial aid to Britain, for the fiscal year April 1, 1941, to March 31, 1942, would amount to $2,350,000,000. Of that amount, taxes were expected to provide $1,500,000,000, the remainder to come from public loans.

In spite of this unprecedented scale of public expenditure, industry, commerce and public credit remained on a stable basis. The quotations for dominion securities never varied much from a 3¼% basis. War industries constantly absorbed all workers dropped and created so large a demand for labour that unemployment virtually disappeared. The do-

minion government terminated at the year, without protest, all contributions to provincial doles for unemployment. On the other hand, prices and wages rose to a point to justify some apprehensions. This condition was dealt with by a comprehensive measure which placed a ceiling on wages and prices. (See *War Price and Wage Control* below.)

As the year moved on, greater attention was drawn to the possibility of aerial attack on Canada itself, especially after the declaration of war on Japan in December. Various precautionary measures, however, had been adopted. The maritime coast led the way in the institution of blackouts and anti-aircraft defense, of which the details remained a military secret. Inland cities also instituted whole or partial blackouts. An unofficial organization, the Civilian Protection committee (A.R.P.) was formed throughout Canada, receiving government aid, but without mandatory power.

It became doubtful to many Canadians during the year whether sufficient troops could be raised without adopting compulsory conscription for overseas. Voluntary enlistment had fallen, producing in the summer of 1941 inadequate results. Conscription was then widely advocated, especially in the province of Ontario, and among the population of British birth or origin everywhere in Canada. Arthur Meighen, on assuming the leadership of the Conservative party, stressed the urgent need for conscription. All his followers, together with certain members of the Liberal party, were equally insistent in their public utterances on the need for conscription.

The entry of the United States profoundly altered the military situation in Canada. The Mobilization act was extended to service across the U.S. frontier. The obvious contrast between the United States compulsory draft for overseas and the Canadian voluntary plan seemed inconsistent with devotion to a common cause.

War Price and Wage Control.—The government of Canada adopted in 1941, under the authority of the Canada War Measures act (*Revised Statutes of Canada*, 1927), a plan for complete control over all wages and prices. The plan went into full operation, the wage part after Nov. 15, the price part after Dec. 1, 1941. The plan had two sides, a price side and a wage side. Likewise there were two ceilings, a price ceiling and a wage ceiling.

The principle of the price part of the plan was as follows: There was to be no change in the price of anything from Dec. 1, 1941. This order applied to the whole range of goods and services alike, offered for sale in Canada. Imported goods offered for sale in Canada were subject to the same regulations. The ceiling price was placed at the highest price charged during the period, Sept. 15–Oct. 11, 1941.

The government was explicit and definite in its instructions to the sellers of goods. The order stated that all goods customarily sold should continue to be sold, and sold at the ceiling price or lower. Goods not sold before were subject to the rule that "no merchandise can be priced for sale at a price higher than would have been appropriate if such goods had been sold during the basic period September 15th to October 11th." With respect to new purchases of goods, the order had this to say: "Where the manufacturers' or wholesalers' asking price is too high to enable the retailer to have his usual gross mark-up, the retailer, the wholesaler and manufacturer should arrange between themselves to absorb a fair share of this higher cost, so that the price to the consumer will not be increased."

The wage part of the plan was the same in intent as the price part, but narrower in scope. It forbade an increase in the wage of anyone above the rank of foreman or its equivalent from Nov. 17. However, employers with less than 50 employees (in building and construction, less than 10) were exempt from the order, as were hospitals, religious, teaching and other charitable organizations. Farming, fishing and hunting were not touched at all. In return, these wage earners received special treatment in the way of a cost-of-living bonus.

A cost-of-living bonus was to be paid by the employers to all the wage earners affected. Previous to the adoption of this plan, all war industries were already compelled by law to pay their workers a bonus of 25 cents per week per point rise in the cost of living over Aug. 1939. These industries had to continue that bonus and add to it an amount calculated in the same way and based on the rise in the index number for Oct. 1941 over the latest index used. The total of the bonus paid from Nov. 15 and effective to Feb. 15 was $3.65 per week, calculated on a 14.6 increase in the cost of living. The respective figures for August were 100.9; for October, 115.5. The next change was due Feb. 15, 1942, and subsequently at the end of each ensuing three months.

Employers who had not been paying the bonus, and came under the order, had to start to pay it and continue to pay it from Feb. 15, 1942, on the basis of the rise in the cost of living from Oct. 1941 (the date of order) to Jan. 1942.

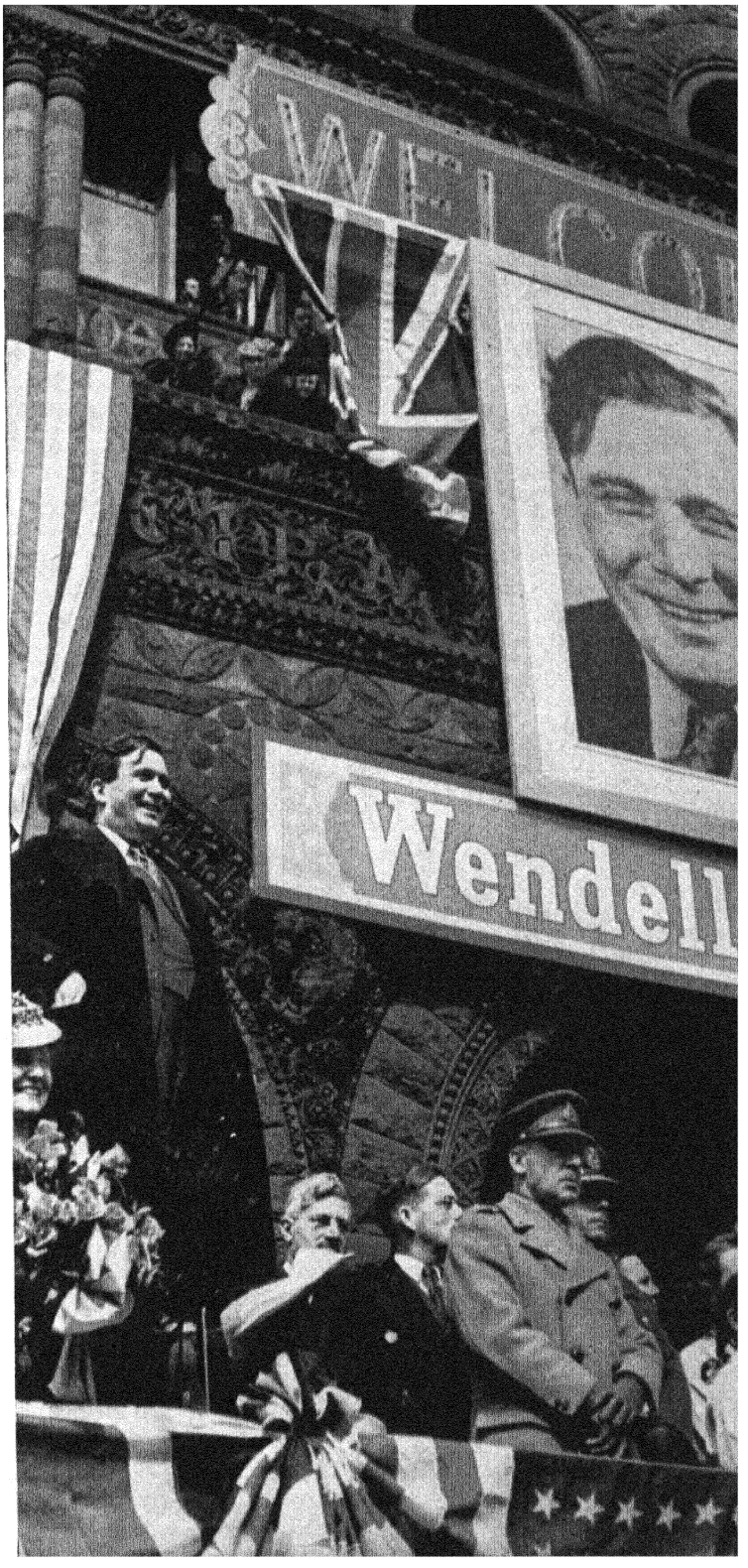
Male employees under 21 years of age and all female employees earning less than $25 per week were to receive a bonus of 1% of their wage per week for each point rise in the cost-of-living index.

The administration of wages was made the particular duty of a new board, called the National War Labour board, consisting of a chairman and four members representing employers and four members representing employees, appointed by the government. Five regional boards were set up to act under the national board. The control of prices was added to the task of the Wartime Prices and Trade board. This board was established in 1939, when Canada entered the war. Both boards were given full and complete powers.

Certain special functions were given to a new body, the Price Stabilization corporation. It was made up of a chairman, Hector McKinnon, former chairman of the price board, and associates, mainly chosen from the business world, but all appointed by the government. The duties of the Stabilization board were to buy and to resell imports.

Cotton, rubber, necessary consumers' goods, the component parts of essential machinery and such like were to be bought by the Stabilization corporation and resold in Canada. The government was to absorb the loss where it occurred. It was expected that the Stabilization corporation would have to act, sooner or later, as an export agency as well.

The Price Stabilization corporation also had the power to lend, grant or otherwise provide funds for legitimate business where and when decided necessary. This power to subsidize industry is not to be confused with general subsidization of all production and distribution. It was to be used only when other means had been exhausted.



WENDELL WILLKIE was greeted tumultuously at the city hall during his visit to Toronto, Canada March 24, 1941

The policy of the price board was to compel industry to cut its suit to its cloth, including profits. While the board had no intention of allowing any essential enterprise to go to the wall in 1941 by the imposition of price control, nevertheless profits were undoubtedly to be reduced, and those who were in the best position to do so would have to make the greatest sacrifice. In other words, when the "squeeze" became too great, the Stabilization corporation was to relieve the pressure. "Moreover, the continued flow of goods is of the utmost importance, and the board will be forced to intervene if suppliers divert business abnormally to suppliers who offer to pay higher prices." Business was warned that "the board has the power to reduce prices, and will exercise that power, if necessary, where it is convinced that prices are not justified by necessary costs of operation."

The price ceiling applied to each individual store, department or branch, on the basis of its own prices for each separate kind and quality of goods and services during the basic period. The lower-price stores were not per-

mitted to raise their prices to the level of the higher-price stores.

Suppliers of goods and services were not permitted to give the consumer less value for his money by lowering quality, material, style, workmanship, size, weight or intrinsic value.

The prices of agricultural products and fish required a somewhat different method of control. In these lines the producer's maximum price was governed by the highest prices paid in recognized markets during the Sept. 15–Oct. 11 period. In certain cases minimum prices for specific commodities, such as milk, butter, cheese and eggs, might be fixed by the board.

The machinery of control through which the Wartime Prices and Trade board worked in 1941 was a licensing system. All persons in the business of buying and selling were required to have licences, and had to have one after Dec. 1. The licences were issued by the board, subject to their rules and regulations, and might be revoked by the board. In addition, definite penalties for violating the law were prescribed.

The wage plan was further widened late in Nov. 1941 to include all wage earners in the classes above mentioned, employed in any establishment irrespective of the number of employees; and all persons above the rank of foreman employed on a salary basis. In the case of the latter the salary rate was established at the amount paid previous to Nov. 7, 1941, without provision for the statutory cost of living bonus. (J. T. C.)

Education.—In Canada education is under provincial control. In Quebec the organization and finance of public education is entirely separated on religious lines as between Roman Catholics (under the Roman Catholic committee of the Council of Public Instruction) and all others, under the parallel Protestant committee. Under neither is education compulsory. In all other provinces public education is secular, under a provincial department and minister, elementary education being free and compulsory. In all provinces except Quebec secondary education is carried on in public

Table I.—*Education in Canada, 1939*

	Institutions	Pupils	Teachers	Expenditure
Provincially-controlled schools				
Ordinary and technical day schools	32,800	2,191,876	75,526	
Evening schools	452	93,340	2,500	
Correspondence courses	7	21,564	300	$130,000,000
Special schools	20	5,051	500	
Normal schools	83	6,501	689	
Privately-controlled schools				
Ordinary day schools	865	90,956	4,955	
Business training schools	189	20,533	694	5,800,000
Dominion Indian schools	378	18,396	600	2,331,554
Universities and colleges				
Preparatory courses	60*	19,803	1,413	
Courses of university standard	155	49,356	5,825	19,000,000
Other courses at university	10*	55,455		
CANADA	35,019	2,572,831	93,036	157,131,554

*Includes only affiliated schools that are not enumerated in "Courses of university standard."

high schools or the similar, better equipped, collegiate institutes, and in endowed private schools. In Quebec secondary education for Roman Catholics is organized under clerical control in colleges; for others (all called Protestants) in high schools and in endowed private schools. There are provincial universities at Toronto, Fredericton, N.B., Winnipeg, Saskatoon, Edmonton and Vancouver. The chief endowed universities are McGill (Montreal), Dalhousie (Halifax), Queen's (Kingston), Western (London), all of which are secular. The chief clerical institutions are the denominational colleges federated to the University of Toronto: McMaster university (Hamilton, Ont.), Baptist; Bishop's (Lennoxville, P.Q.), Anglican; Mount Allison (Sackville, N.B.), Methodist; Laval (Quebec city) and the University of Montreal, Roman Catholic. The endowed and the clerical universities, although not controlled by the provincial, receive a certain measure of provincial support.

Defense.—See *Canada at War*, above.

Finance.—The monetary unit is the gold dollar, of 2,580 gr., nine-tenths fine (23.22 gr.), as was the U.S. dollar till 1934. No gold dollars were coined except from 1908 till 1919. The British gold sovereign is unlimited legal tender at $4.86⅔ (1941). Redemption in gold was suspended in 1931. After the outbreak of war the exchange value of the Canadian dollar in and out of Canada was set by the Exchange Control board; banks bought U.S. dollars at $1.10 Canadian and British pounds at $4.43 and sold respectively at $1.11 and $4.47. Beyond Canadian control, except as regards re-entry to Canada, Canadian dollars were sold in a "free" market in New York city, closing at a discount of 14% at the end of 1941. The dominion budget for 1940–41 is shown in Table II. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES.)

Table II.—*Dominion Expenditure*

Apr. 1, 1940—March 31, 1941. War, direct	$1,450,000,000
Advanced to cover British war expenditure in Canada and assumed (Dec. 1941)	900,000,000
All other expenditure	470,000,000
	$2,820,000,000
Gross debt (March 31, 1941)	$4,744,057,000
Net Debt (March 31, 1941)	$3,666,316,000

Banks.—Number of chartered banks, ten (Sept. 1941); capital and reserves $279,250,000; deposits: government $371,397,794; public in Canada $2,665,491,054; foreign $457,742,625; loans in Canada $1,242,505,257; abroad $132,153,688; call and short loans $88,689,480.

Trade and Communication.—The nature of the volume and direction of Canadian foreign trade was greatly altered by the war. In 1941 the main features were imports (war and general) from the United States and exports (chiefly food and war supplies to the United Kingdom). Trade with continental Europe (except the U.S.S.R.) was practically obliterated, as also with South America. Trans-pacific trade was greatly affected; trade with Japan fell to insignificant proportions with that to India, Burma and China greatly increased.

There were 42,565 mi. of steam railroads in Canada in 1940; in that year 21,969,871 passengers and 76,175,305 tons of freight were carried. There was a total of 497,707 mi. of highway in 1940 (114,254 mi. surfaced; and 383,453 mi. unsurfaced); motor vehicles licensed in 1940 numbered 1,500,829. Commercial air lines (1940) operated 32,508 mi. of airways and carried 137,690 revenue passengers. Telephones in 1939 numbered 1,397,272; the wire mileage of telegraphs in 1940 was 380,318. In 1940 there were 96 private and 78 public broadcasting stations; 1,345,157 private receiving sets were licensed.

Table III.—*Canadian Exports, 1941 and 1939 (10 months)*

Destination	Exports in first ten months of 1941	Exports in first ten months of 1939
United Kingdom	$548,985,000	$268,759,000
Rest of empire	177,438,000	84,010,000
United States	477,593,000	281,195,000
U. S. S. R.	1,285,000	2,000
China	6,126,000	2,441,000
Egypt	55,639,000	277,000
India and Burma	34,023,000	4,029,000
Straits Settlements	7,973,000	2,158,000
Newfoundland	22,243,000	6,660,000
Germany	.....	7,869,000
Italy	.....	2,097,000
Japan	1,501,000	24,124,000
All countries	1,308,006,000	726,741,000

Agriculture.—Statistics regarding various Canadian crops are given in Table IV.

Table IV.—*Estimated Canadian Field and Fruit Crops, 1941; Harvests of these Crops 1939 and 1940*

	1941	1940	1939
Wheat, bu.	306,459,000	551,390,000	520,623,000
Other grains (oats, barley, rye, flaxseed), bu.	500,597,000	501,825,000	504,905,000
Hay and clover, tons	12,080,000	14,070,000	13,377,000
Apples, bbl.	3,495,800	4,292,300	5,476,300
Pears, bu.	560,000	576,300	577,100
Soft fruits (plums and prunes, peaches, apricots and cherries), bu.	1,396,500	1,215,100	1,485,100
Strawberries, qt.	19,656,200	25,298,800	28,290,400
Raspberries, qt.	8,719,000	11,603,200	11,094,200
Grapes, lb.	52,555,000	52,727,200	55,595,900

Manufacturing.—The index of industrial production in Canada (1935-39=100) stood at 148 in 1941, an increase of 12% over 1940. The index of employment was 149 (1926–100), an increase of 23%.

Table V.—*Principal Products of Canada (First Ten Months of 1941)*

		Increase or decrease per cent from 1940
Coal, tons	15,748,767	+ 4
Flour, bbl. (9 months)	15,633,444	+33
Newsprint, tons	2,824,734	− 2
Steel ingots, long tons	1,971,909	+19
Pig iron, long tons	1,082,222	+13
Motor cars and trucks, number	228,573	+29

Mineral Production.—The government withheld from publication in 1941 all statistics of the production of copper, nickel, lead, zinc, aluminum and asbestos. The production of other minerals and metals is given in Table VI.

Table VI.—*Mineral Production of Canada (12 Months Ending June)*

	1941	1940	1939
Coal, tons	17,745,840	17,141,176	14,103,187
Gold, fine oz.	5,363,186	5,178,159	4,996,631
Silver, fine oz.	20,812,975	24,206,642	22,104,984
Gypsum, tons	1,549,080	1,607,527	1,031,806
Petroleum, bbl.	9,000,093	8,147,204	7,415,988

(S. LEA.)

Canadian Literature.

The most important contributions to Canadian literature during 1941 were scored in fiction, with *Barometer Rising*, by Hugh Maclennan, and *As for Me and My House*, by Sinclair Ross, leading in this genre. *Highway to Valour*, by Margaret Duley, is noteworthy for its fine portrayal of Newfoundland life. *Wakefield's Course*, by Mazo de la Roche, supplements the already impressive Jalna saga. Evelyn Eaton's *Restless Are the Sails* and Alan Sullivan's *Three Came to Ville Marie* are costume novels in the romantic tradition.

A new and distinguished talent was revealed in Emily Carr's *Klee Wyck*, prose sketches dealing with the artist-author's ex-

periences among the west coast Indians. B. K. Sandwell's *The Canadian Peoples* and Watson Kirkconnell's *Twilight of Liberty* are useful additions to the literature of present-day affairs. Two juveniles deserve special mention. These are *Jory's Cove*, by Clare Bice, and *Sugar Shanty*, by Louise Richardson Rorke.

The year's poetry was disappointing, on the whole. Anne Marriott's *Calling Adventurers* was perhaps the most interesting publication, but it lacks the strength of some of her previous work. Doris Ferne's *Ebb Tide* and Molly Morant's *The Singing Gypsy* contain conventional verse of pleasing quality. Charles Bruce achieved distinction in *Personal Note*, a timely work on an inspirational theme. The appearance of a new quarterly magazine, *Contemporary Verse*, was a praiseworthy development in this field.

The governor general's awards for 1940 went to E. J. Pratt for *Brebeuf and His Brethren* (poetry), "Ringuet" (Philippe Panneton) for *Thirty Acres* (fiction) and J. F. C. Wright for *Slava Bohu* (general literature). (E. F. GL.)

Canals and Inland Waterways.

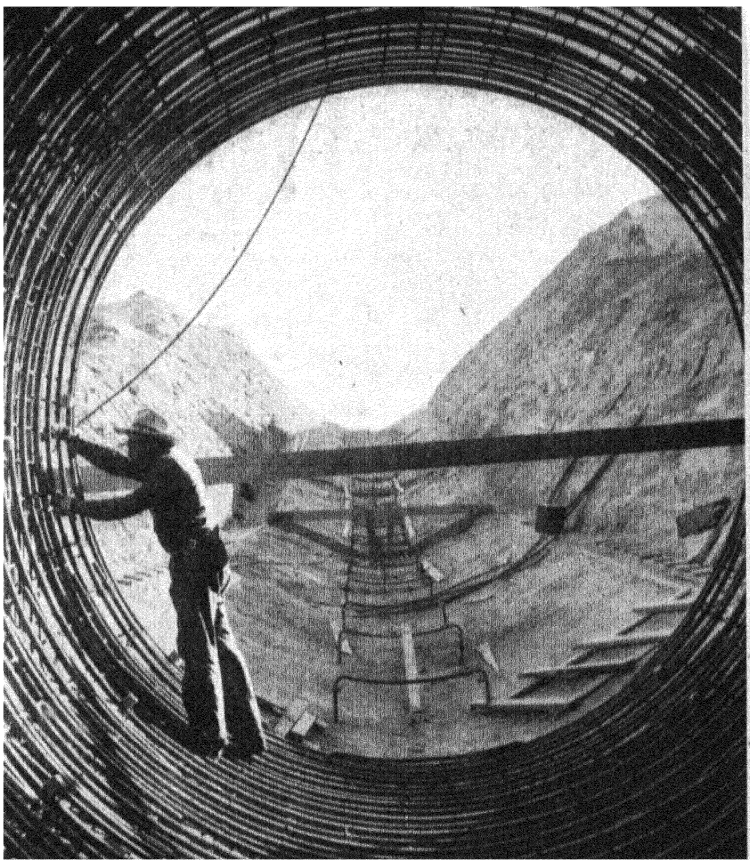
The principal inland navigable waters of the United States are the Great Lakes, the New York State canal system, the Mississippi river system, the Atlantic Intracoastal waterway, the Gulf Intracoastal waterway from St. Marks river in Florida to Corpus Christi, Tex., the San Joaquin-Sacramento system in California, and the Columbia system in the northwest. The Great Lakes have natural deep water except in the connecting channels, which have been artificially deepened where necessary to accommodate a draft of about 24 ft.; and the Welland Ship canal joining Lakes Erie and Ontario, as improved by Canada, has a permissible draft of 23·5 ft. The 12-ft. New York State Barge canal in 1941 was being deepened to 14 ft. between the Hudson river and Lake Ontario at Oswego. The Atlantic Intracoastal waterway system between Trenton, N.J. and St. Johns river, Fla., was dredged to 12-ft. project depth; and from St. Johns river to Key Largo, Fla., 63 mi. below Miami, the project depths of 8 and 7 ft. were provided.

The Cape Cod canal had been improved to provide a channel width of not less than 500 ft. and a depth of 32 ft. The Chesapeake and Delaware canal afforded a depth of 27 ft. On the gulf coast adopted projects provided for a protected intracoastal waterway not less than 9 ft. in depth between St. Marks river, Fla. and Corpus Christi, Tex., more than 1,000 mi., and this depth was in general available from Carrabelle, Fla., to Freeport Harbor, Tex. Dredging of the waterway extending southwest of Freeport was in progress. The Mississippi river had a 35-ft. depth to Baton Rouge, a 9-ft. depth from Baton Rouge to St. Louis and thence by a series of 26 locks and dams a channel of 9-ft. depth to Minneapolis, Minn. Improvement of the San Joaquin-Sacramento river system, which is connected with San Francisco bay via Suisun bay and San Pablo bay, provided a 30-ft. channel through Suisun bay to the junction of the San Joaquin and Sacramento rivers; a 30-ft. channel on the San Joaquin to Stockton, Calif., and a 10-ft. channel on the Sacramento to Sacramento, Calif., in addition to other lesser channel improvements. The Columbia river had been improved to provide a 40-ft. channel across the bar at the mouth, a 35-ft. channel to the mouth of the Willamette river (together with a 35-ft. channel up the Willamette to Portland, Ore.), a 30-ft. channel thence to Vancouver, Wash., and thence a 27-ft. channel on which work was in progress to Bonneville dam (144 mi. above the Columbia river mouth), with smaller project depths upstream.

Traffic on Major Canals and Inland Waterways of the U.S. for 1940

Waterway	Tonnage
Detroit River	111,346,567
St. Marys Falls Canal	80,360,174
Sabine-Neches Waterway	38,433,353
Mississippi River, Minneapolis to The Passes	32,372,232
Monongahela River	29,559,909
Ohio River	29,549,275
Houston Ship Channel	27,385,598
Columbia and Lower Willamette Rivers, below Vancouver and Portland	15,027,718
Louisiana-Texas Intracoastal Waterway	11,643,436
Hudson River (above Port of New York)	11,515,720
Cape Cod Canal	7,901,102
Illinois Waterway	5,729,356
New York Barge Canal	4,768,160
Kanawha River	4,490,454
Delaware River, Philadelphia to Trenton	4,410,253
Allegheny River	3,928,732
Chesapeake and Delaware Canal	3,794,990

Authority: The Corps of Engineers, U. S. Army.



CONSTRUCTING one of the three 12-ft. siphons for the Madera canal of the Central valley project, Calif., in 1941, to carry the canal across small canyons

For statistics regarding the Panama canal *see* PANAMA CANAL AND CANAL ZONE. *See* also AQUEDUCTS; RIVERS AND HARBOURS; WATER-BORNE COMMERCE OF THE UNITED STATES. (J. L. S.)

Great Britain.—Nothing much can be said about actual developments in canals and inland waterways in Great Britain during 1941. The restrictions imposed by war render it undesirable to make any definite allusion to works of navigational importance which were carried out; indeed, generally speaking, the works actually executed were of a character insufficiently important for specific localized mention, even if permissible. The catchment boards continued their policy of gradually ameliorating the river channels in their respective areas, alike for purposes of land drainage and the prevention of floods and also for navigation. Reference may be made to operations on the River Nene, as a typical example of modern river development, and it can be said that during the year 1941 the dredging of the main channel between two important towns on its banks was completed and that several of the locks along the course of the river were reconstructed and enlarged. The inverts at a number of small bridges were lowered.

The canal system of Great Britain, which had for a long time been neglected through regrettable apathy on the part of the

authorities, was lately engaging the serious attention of the government. In March 1941, Frank Pick, formerly vice-chairman of the London Passenger Transport board, was commissioned by the minister of transport "to investigate and report upon the carriage of traffic on canals and inland waterways." After an interval of a few months, the official announcement was made in September of the formation of a Central Canal committee, under the chairmanship of Colonel J. J. Llewellin, parliamentary secretary to the ministry "to advise him on questions of policy and to co-ordinate the work of the regional canal committees." Following Pick's recommendations, the six regional committees were reconstituted and strengthened "with a view to providing an effective supervisory machinery composed of those already skilled and knowledgeable in the canals and canal traffic of the region, to ensure that canals and canal facilities are worked as a unit and that their resources as a whole are used to the greatest advantage." This was a decided step forward, indicating a progressive policy for British canals, and holding out promise for their future care and development.

Europe.—On the continent of Europe, nearly everything was lost in the fog of war. Outstanding canal and river development programs which it is known were actively in progress, principally in Germany and Russia, were enveloped in obscurity; it was impossible to glean particulars respecting their progress. Germany and all axis countries naturally withheld all information on the subject and, as regards Russia, it can only be said that various sections of a comprehensive national scheme of waterway development, set out in successive "Five Year Plans" made a certain amount of headway, though progress would have been checked and, in all probability, completely suspended after the invasion of soviet territory by the German forces in June. Indeed, the general devastation wrought all along the battle front must inevitably have included the destruction of much previously completed work in the shape of locks, weirs, bridges and embankments. (B. Cu.)

Canal Zone: *see* Panama Canal and Canal Zone.

Cancer. A study of the relationship between chemical configuration and carcinogenic capacity formed an important portion of the cancer research during 1941. Only one new phenanthrene compound was described which was carcinogenic and yet contained a considerable addition of new radicles to the phenanthrene structure. In general, the addition of substances in various positions of the benzene rings of the known carcinogenics, like dibenzanthracene and methyl cholanthrene, so as to increase the size of the molecule, have not increased, but rather diminished, the carcinogenic activity. Very curiously it has been found that the complex synthetic hormone, stilbestrol, which hitherto has been studied because it had the same capacities in inciting heat in animals or in replacing theelin in human females, has in addition the same relationship as theelin to the appearance of adeno-carcinoma of the breast in male mice of a strain in which the females develop cancer. Stilbestrol given to male mice in large quantities also produces a diffuse hyperplasia of the interstitial cells of the testicle, and about a year after large quantities of the substance had been implanted under the skin in the form of tablets, testicular tumours may appear in a considerable number of the animals. These tumours resemble the interstitial cell growths of the testicle rather than the complex teratoid tumours produced in chickens by the injection of zinc chloride.

The influence of nursing on the production of breast cancer in mice is very peculiar. If a non-cancerous strain of mice is employed, and if these mice are nursed by a strain with a high rate of spontaneous cancer, the stilbestrol pellets induce a certain number of cancers. This effect of foster nursing is most striking when the mice from a strain resistant to cancer were transferred to a high cancer strain a very few days after birth. When older, the cancer-producing effect is not noticeable. Why the transfer of milk from a mouse not having a cancer should render the recipient more likely to have a cancer than if nursed by its own mother is absolutely baffling. The latest suggestion was that a virus may be transferred in the milk.

The tumours originally produced by the synthetic carcinogenic substances discovered by Kennaway and Cook were chiefly in the skin and connective tissues of mice and rats. The tumours did not differ greatly from the growths occurring spontaneously in these sites, with the exception of the fact that a considerable proportion containing actively growing muscle fibres were observed. Such rhabdo-myo-sarcoma are very rare in human beings. Up to Jan. 1, 1942, however, practically all of the human types of malignant neoplasms were produced in the various organs of these two experimental animals. Tumours were being produced also in fair quantity in guinea-pigs and rabbits, but there was no record of neoplasms appearing after the injection of carcinogenic substances in larger mammals, probably due to the fact that sufficient time had not elapsed for the cellular mutation to take place.

Chemical studies centred around tissue extracts. Schabad showed that extract of human lung from persons both with and without cancer is capable of inciting the growth of a few malignant tumours in animals, but the nature of this carcinogenic substance remains unknown.

The attention of cancer investigators turned to the effects of the vitamins and hormones, and it was shown that large quantities of calcium pantothenic acid caused marked stimulation of the growth of tumours in mice, and when an extreme deficiency of pantothenic acid was produced by suitable feeding, the tumours slowed down in their progress, but to obtain such an effect, the deficiency condition had to be so complete that many of the animals died, so that the production of a deficiency of this substance cannot be considered as a promising form of treatment.

In this same field also West and Woglom showed that the biotin content (vitamin H) of tumour cells is considerably higher than that of the corresponding normal tissues, in this regard resembling the embryo. The one exception was liver carcinomas produced in rats by feeding butter yellow. Laurence suggested that some of the so-called spontaneous recessions of malignant tumours in man may be explained by a biotin deficiency, but experiments along this line have not confirmed this theory.

When it was observed that the alkaloid, colchicine, exerted an extraordinary stimulating effect on the division of cells in various normal tissues, it was hoped that by the injection of this substance a great increase in cell division in tumours might be induced, for the general opinion has been that the more dividing cells in a tumour, the more sensitive that tumour would be to radiation, because radiation affects primarily the chromosomes of the dividing cells. The results, however, have been very disappointing, as the dose of colchicine required to produce a very slight effect on a tumour, when combined with radiation, is so large as to produce severe toxic effects in the patient.

A study of the effects of the injection into the circulating blood of artificially radioactive compounds, chiefly radioactive phosphorus, continued. The procedure seems to have little influence on the growth of tumours, but as was shown many years ago, using thorium X or other natural radioactive products, considerable benefit may occasionally be produced in the chronic leucaemias, especially of the myeloid type. On the other hand, as the older experiments showed and unfortunately experiences since

have emphasized, there is a not inconsiderable danger in the administration of these products, so that it is well that their administration be confined to those who have had wide experience with such a form of treatment, and that there be no general distribution to the medical profession of such highly dangerous products.

Leucaemia and allied diseases were still well treated by X-ray, of which the effective technique is well known, and it would be wise not to make too rapid a change in the general treatment of these diseases and abandon the old before the new has been thoroughly tested at competent hands.

Experiments with neutron beams were also being carried out under skilled auspices, but no extraordinary effectiveness in the cure of cancer was observed. In fact, it is much more likely that good results in the treatment of cancer in the future will be more promptly obtained by the careful study of the types of the tumours treated and the details of the technique than from any new developments in the use of the various types of charged, or, as in the case of neutrons, of uncharged particles. (*See* also ALIMENTARY SYSTEM, DISORDERS OF; MEDICINE.) (F. C. W.)

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Candler, Warren Akin (1857–1941), U.S. churchman, was born Aug. 23 in Villa Rica, Ga. After graduating from Emory college he became a circuit preacher. He was president of Emory college, 1888–98, and became a bishop in the Methodist Episcopal Church, South, in 1898. Bishop Candler strongly opposed the movement that led to the union of the northern and southern Methodist churches, and in 1928 he refused to join Southern Methodist churchmen who openly fought the candidacy of Al Smith for president, declaring that the church should stay out of politics. He helped found Emory university, with the aid of a $1,000,000 endowment he secured from his brother, Asa, founder of the Coca-Cola company, and had the institution moved from Oxford to Atlanta, Ga. Bishop Candler died in Atlanta, Sept. 25.

Candy. The confectionery industry in 1941 enjoyed one of the best years in its history both from the point of view of sales and general stability. With the continuance of the war, however, the outlook did not loom as bright.

Because of improved general conditions, candy production in 1941 was 25% greater than the 2,000,000,000-lb. level reached in 1939. The sales increase in 1941 over 1940 was 18%, compared with an increase of 7% in 1940 over 1939 business. The 1941 tonnage of 2,500,000,000 lb. of candy was produced by 1,100 plants (about 100 less than in 1940), employing more than 50,000 people. Wholesale sales in 1941 amounted to about $350,000,000, with retail sales amounting to $700,000,000. Forty manufacturers reported sales of $1,000,000 or over, 65 manufacturers were responsible for 60% of the volume while less than 200 manufacturers produced 60% of the industry's tonnage.

The average value per pound of candy in 1941 was 19 cents as compared with 16 cents in 1940. Per capita consumption in the United States was slightly above 19 lb., which means that the average American consumer bought about $5 worth of candy in 1941. Manufacturers increased their prices but not sufficiently high to compensate for increased costs.

Candy is largely a "penny business," with the bulk of volume sold in one-cent units. During 1941, however, the number of penny as well as five-cent items (the second most important unit of sale) on the market showed a decline as compared with 1940. Moreover, larger increases were reported on higher-priced candy than on one-cent or five-cent items. The trend continued sharply toward higher-priced candies.

Candy manufacturers were feeling the impact of the war. All sugar stocks were frozen by an OPM order early in December. This means that manufacturers may not receive delivery of sugar beyond 30-day requirements and may not use stock on hand beyond 60-day requirements. Sugar is one of the three most important ingredients used in the manufacture of candy. The other two are corn syrup (glucose) and chocolate. The order freezing sugar stocks did not apply to corn syrup, with the result that formulae changes would be affected, calling for greater use of corn syrup and less of cane and beet sugar (sucrose). A price ceiling was placed on sugar but not on corn syrup and cocoa. The use of foil and cellophane was drastically curtailed. Instead of foil, the popular chocolate bars were packed in parchment, glassine and other substitute wrapping material. But even these packaging as well as shipping materials were difficult to obtain. The supply of some ingredients, notably almonds and coco-nut, dwindled. There was about a year's supply of cocoa and chocolate on hand by the end of 1941, while certain essential oils and flavouring materials became increasingly difficult to obtain. There was practically a complete halt in the exportation and importation of candy in 1941. (H. D. G.)

Cane Sugar: *see* SUGAR.

Canning Industry. U.S. and territorial canned food production in 1941 totalled about 470,000,000 cases, compared with about 375,000,000 cases in 1940 and about 316,000,000 cases in 1939. Production of canned foods since 1930 increased much faster than the population but the large increase in production of canned foods during 1941 was to provide for the requirements of the armed forces in the United States, together with the large quantities shipped to Great Britain and other countries under the lend-lease program.

The greatest increases in quantities of canned foods for the defense program were canned milk, from 58,000,000 cases in 1940 to 75,000,000 cases in 1941, canned meat from less than 15,000,000

THE NEED of the expanding U.S. army for greater quantities of canned food was pointed out by Lieut. Col. Paul P. Logan at the 1941 annual canners' convention in Chicago

cases in 1940 to 25,000,000 cases in 1941, and canned vegetables from 204,000,000 cases in 1940 to 260,000,000 cases in 1941. There were increases also in the packs of fish, fruits and fruit juices.

Substantial increases in canned food production in 1941 brought about parallel increases in the consumption of materials such as tin-plate, fibreboard boxes, and ingredients such as sugar which go into the manufacture and distribution of these foods. In 1940 about 28,000,000 base boxes of tin-plate were used, which increased in 1941 to about 35,000,000 base boxes.

National Defense.—In providing for the expanding needs for subsistence of the armed forces and nations benefiting under the lend-lease program, it seemed that still greater demands would be made upon the canning industry in 1942. The industry was, therefore, aligning itself in the direction of maximum production.

Research.—Research in 1941 had the objective of quality maintenance under conditions of expanded production. Investigations were made to determine the practicability of methods intended to conserve tin. Such research would be continued in 1942. (E. J. C.)

Cannon, Annie Jump (1863–1941), U.S. astronomer, was born Dec. 11, in Dover, Del. The most famous woman astronomer of her time, Miss Cannon was the first woman to receive an honorary doctor's degree from Oxford university, the first woman officer of the American Astronomical society, and one of the few honorary members of the Royal Astronomical society of London. In 1931 she won the Henry Draper medal of the National Academy of Sciences for her catalogue of 225,000 stellar spectra. She joined the Harvard faculty in 1897 and in 1911 she was appointed curator of astronomical photographs. In 1938 she was named William Cranch Bond astronomer, a post established in honour of the founder of the college observatory. Although she retired from Harvard observatory in Sept. 1940, she continued her work at the Harvard observatory on a special astronomical mission from Yale. She died in Cambridge, Mass., April 13. (See *Encyclopædia Britannica.*)

Canton Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Caperton, William Banks (1855–1941), U.S. naval officer, was born June 30 in Spring Hill, Tenn. He was graduated from the naval academy in 1875, became an ensign in 1877 and was promoted through the grades to admiral in 1916, retiring three years later. In the Spanish-American War he was executive officer aboard the "Marietta," which raced from the Pacific to the Atlantic to engage in the fight against Adm. Cervera's fleet. Disregarding seniority, President Wilson named him admiral and commander-in-chief of the Pacific fleet in 1916 in recognition of his skill in handling the West Indies uprisings in 1915 and 1916. During World War I he co-operated with the French and British navies and cleared the South Atlantic of German raiders. Adm. Caperton died at the naval hospital in Newport, R.I., Dec. 21.

Cape Verde Islands: *see* PORTUGUESE COLONIAL EMPIRE.
Carleton Tunnel: *see* TUNNELS.

Carnegie Trusts. Carnegie Corporation of New York, established by Andrew Carnegie in 1911 and endowed with $135,000,000, expends its annual income in grants to institutions and agencies whose activities aim at the advancement and diffusion of knowledge and understanding among the people of the United States and of the British dominions and colonies. Frederick P. Keppel, president since 1922, retired and was succeeded by Walter A. Jessup, who will be president of both the corporation and the foundation.

During 1940–41, the corporation trustees appropriated a total of $2,706,834: library interests, $398,511; adult education, $566,930; fine arts and museums, $285,452; research and publication, $906,956; general educational purposes in schools, colleges, universities, etc., $548,985. The amount appropriated since 1911 totals $184,430,549.

The five other separately administered Carnegie organizations in the United States, which were founded by Mr. Carnegie for specific purposes before the establishment of the corporation, with endowments ranging in 1941 from $10,000,000 to $30,000,000, followed their established programs described regularly in their annual publications.

Carnegie Institute of Pittsburgh (1896), which comprises an institute of technology, a museum of fine arts, a music hall, a museum of natural history, a public library and a library school, carried out its normal programs.

Carnegie Institution of Washington (1902), devoted to scientific research, has expended since its organization $45,558,556 in its program of encouraging investigation, research and discovery, and the application of knowledge to the improvement of mankind, specifically by work in astronomy (Mt. Wilson observatory), terrestrial magnetism, geophysics, animal and plant biology, and historical research (especially in Yucatan). Many of its staff and a large part of its research faculties were engaged in services relating to the national emergency.

Carnegie Hero Fund Commission (1904), established to recognize heroic acts performed in the United States of America, the Dominion of Canada, the Colony of Newfoundland, and the waters thereof by persons the nature of whose duties in following their regular vocations does not necessarily require them to perform such acts, announced that the list of its beneficiary aid shows a total of 3,180 recipients of medals and 306 persons receiving pensions. During the 1940–41 fiscal year, 38 persons received educational awards and 38 others received pecuniary awards for specific purposes. Its awards for the year 1940 totalled $147,637.74.

Carnegie Foundation for the Advancement of Teaching (1905), established to provide retiring pensions for teachers and to advance higher education, paid $1,929,443.13 in retiring allowances to retired college professors, or their widows, making a total of $40,569,056.18 paid for such purposes since its establishment. It has also continued, chiefly from funds provided by the corporation, its program of educational research, including such activities as teacher-testing program, graduate examination study, etc.

Carnegie Endowment for International Peace (1910), established to serve the purpose indicated by its name, expended $625,650 in its efforts to further friendly understanding among the nations of the world. The study of Canadian-American relations, the findings of which are being reported in 44 volumes, published chiefly by Yale university, Ryerson and Oxford presses, was terminated. This activity was made possible by corporation grants to the endowment. (R. M. LE.)

Carol II (1893–), king of Rumania from 1930 to 1940, was the eldest son of King Ferdinand and Queen Marie. For his earlier career, see *Encyclopædia Britannica.*

After the partition of Rumania in the summer of 1940, Carol vacated the throne in favour of his son Mihai on Sept. 6. Fleeing the country with his friend Magda Lupescu, he barely escaped assassination when his train was fired upon by Iron Guardists at the Yugoslav border. He travelled to Switzerland, then to Se-

RUMANIA'S EXILED KING CAROL II and his companion, Magda Lupescu, as they arrived in Bermuda May 10, 1941 from Portugal

ville, Spain. Meanwhile the new Rumanian government had conducted inquiries into his royal income and threatened to ask his extradition from Spain. The Spanish government placed Carol and Lupescu under guard but did not return them to Bucharest. On March 3, 1941 Carol and Lupescu eluded a Spanish police guard and crossed the border into Portugal. They sailed for Bermuda in May, toured the West Indies and Cuba, then took up their residence in a suburb of Mexico City in July. There, on Jan. 7, 1942, Carol announced that he would proclaim himself regent of Rumania (because his son ruled under the duress of German occupation) and leader of the forces of a Free Rumania.

Caroline Islands: *see* PACIFIC ISLANDS, MANDATED.
Cataracts of the Eye: *see* EYE, DISEASES OF.
Catastrophes: *see* DISASTERS.
Catholic Church: *see* ROMAN CATHOLIC CHURCH.

Catholic Library Association.

The Catholic Library association was organized in 1921 as the library section of the National Catholic Educational association; in 1931 it became an independent body and in 1936 was incorporated. Membership at the end of 1941 was approximately 700.

The purpose of the organization is to initiate and encourage movements for the progress of Catholic library work and Catholic literature. During the decade 1931–41 it centred its attention on (a) bibliographical guides to contemporary Catholic literature; (b) a classification schedule and rules for cataloguing practice in Catholic libraries; and (c) fostering interest in professional library training among the personnel of Catholic libraries. Promotion of an annual National Catholic Book week is a development in the field of publicizing Catholic literature. To encourage gifts of Catholic books for the many Catholics in the military service, the C.L.A. was co-operating in the 1942 Victory Book campaign.

A series of regional units covers the greater part of the United States. Unit meetings give frequent opportunity for personal contact between members and for direct presentation of policies of the association; of late, these groups have constituted the chief element in training leaders for the national association and in increasing its membership.

Activities in 1941 were carried on or supervised by the following committees: Cataloguing and classification, canonical aspects of books and reading, *Catholic Periodical Index*, committees and special projects, constitution and by-laws, co-operative indexing, defense activities, elections, hospital libraries, library service to Catholic readers, books for high school libraries, membership, National Catholic Book week, publications, publicity and statistical forms. General control of association affairs was in the hands of the advisory board, executive council, president, vice-president and secretary-treasurer. Officers for the term 1941–43 were: Rev. Thomas J. Shanahan, St. Paul seminary, St. Paul, Minn., president; Rev. Andrew L. Bouwhuis, S.J., Canisius college library, Buffalo, N.Y., vice-president; Eugene P. Willging, University of Scranton, Scranton, Pa., secretary-treasurer. Official headquarters of the C.L.A. are at the office of the secretary-treasurer.

Publications.—The *Catholic Periodical Index* is the principal publishing effort of the association; it is a current cumulative author-and-subject guide to contents of more than 50 Catholic magazines. A *Reading List for Catholics* (1940) and a *Supplement* (1941) were issued in connection with the National Catholic Book week and contain recent Catholic books recommended for the general reader. *An Alternative Classification for Catholic Books* (1937), by Jeannette Murphy Lynn, is a scheme for shelf arrangement of theology, canon law and church history to suit the needs of the Catholic library. It may be used to supplement either the library of congress or Dewey standard classifications. Shorter reading lists on special subjects and the bibliographical pamphlet series, *Contemporary Catholic Authors*, are issued several times a year. The official organ is the *Catholic Library World* (1929–). Published monthly from October to May, it contains bibliographical and technical articles and annotated lists of new Catholic books and pamphlets. (T. J. S.)

Catholic Rural Life Conference, National.

Founded in 1923 for the purpose of preserving and promoting sound rural life for and among Catholics, the conference specifies its working aims as: (1) to care for the underprivileged Catholics living on the land; (2) to keep on the land Catholics who are now on the land; (3) to settle more Catholics on the land; (4) to convert the non-Catholics on the land. In general, it is dedicated to the achievement of economic-social-spiritual security for rural America.

The 19th annual convention was held at Jefferson City, Mo., Oct. 4–8. About 6,000 attended the sessions, including 14 bishops, more than 300 priests, professors, rural-life directors, farm leaders, farmers, students, etc. Delegates were present from 40 states. The convention theme was: "What Helps Rural Life Helps the Church and the Nation." Resolutions were passed favouring small ownerships of land and condemning large landownerships, share cropping and short-term leases, one-crop systems and the robbing of soil fertility. Stress was laid on the spiritual vigour of the family unit, on social charity in the community, and on the extension of credit unions, co-operative stores, markets, industries, etc. Attention was paid to rural schools, 4-H clubs, folk games and recreation, effective health-service. Discussion centred also on a program for rebuilding families and for vital space, rebuilding communities in the social reconstruction after the war.

The activities of the conference include vacation schools for children, summer schools for priests and directors, correspondence schools, lecture and library service, information centres, rural, economic and sociological research.

The Most Rev. Aloysius J. Muench, bishop of Fargo, N.D., was elected president. Rt. Rev. L. G. Ligutti was reappointed executive secretary. The official publication is the *Catholic Rural Life Bulletin*. Headquarters in 1941 were: 525 Sixth ave., Des Moines, Ia. (F. X. T.)

Catholic Welfare Conference, National.

Erected under the authority of the bishops of the United States, in 1919, the conference functions as their agency in the United States. It unifies and co-ordinates Catholic effort in the United States in spheres involving the welfare of the church and the nation.

The 23rd annual session of the hierarchy, held at the Catholic university, Washington, D.C., was attended by Dennis Cardinal Dougherty, archbishop of Philadelphia, who presided, and by 15 archbishops and 95 bishops. The officers elected to the administrative board of the N.C.W.C. were: chairman, Most Rev. Edward Mooney, archbishop of Detroit, Mich.; vice-chairman and treasurer, Most Rev. Samuel A. Stritch, archbishop of Chicago, Ill.; secretary, Most Rev. Francis J. Spellman, archbishop of New York, N.Y. The Rt. Rev. Michael J. Ready was again appointed general secretary.

The administrative board issued a statement, "The Crisis of Christianity," dealing with the problems incident to the national and international situation. Plans were outlined for the celebration, May 13, 1942, of the 25th anniversary of the episcopal consecration of Pope Pius XII. A committee of bishops was appointed to promote the wider knowledge of the peace points of the pope.

Episcopal chairmen, members of the administrative board, were appointed to the eight departments.

Gleanings from the reports submitted for 1941 indicate the scope of the conference. *Executive.*—Archbishop Mooney, Detroit, Mich., chairman. Concerned with the status of priests, religious and theological students under the Selective Service act. Efforts were made to safeguard the spiritual and religious welfare of service men and defense workers through the promotion of the National Catholic Community service, a member agency of the United Service organizations. The N.C.C.S. had set up, or planned, a total of 113 service clubs and centres. The bureau of immigration was called upon to settle an unprecedented number of cases, caused by the shifting of war conditions. *Education.*—Archbishop McNicholas, Cincinnati, O., succeeded Bishop Peterson, Manchester, N.H., as chairman. Concerned itself with the impact of the national program for defense and war needs, with the problems of inter-American relations, and with the development of vocational and visual education. *Catholic Action Study.*—Archbishop Murray, St. Paul, Minn., chairman. Continued survey and research regarding programs and achievements at home and abroad. *Social Action.*—Bishop E. V. O'Hara, Kansas City, Mo., chairman. Made special efforts to equip priests to promote social education and action, to increase the number of speakers capable of addressing congresses and group meetings, and to participate in conferences between labour and management. *Press.*—Bishop Gannon, Erie, Pa., chairman. The N.C.W.C. news service, covering all Catholic news, increased circulation to 484 subscribing publications in 31 countries. A Spanish news service for Latin America, *Noticias Catolicas*, begun in May, was taken by 40 papers, many of them dailies. *Lay Organizations.*—Bishop Noll, Fort Wayne, Ind., succeeded Bishop Kelley, Oklahoma City and Tulsa, Okla., as chairman. "The Catholic Hour," weekly broadcast sponsored by the National Council of Catholic Men, was heard over more than 90 stations, and drew 224,908 responses from listeners. The National Council of Catholic Women, organized in 65 dioceses, having 3,469 local branches, engaged in various forms of Catholic action. Its school of social service graduated its largest class, numbering 27. *Legal.*—Bishop Boyle, Pittsburgh, Pa., chairman. Dealt with problems of Catholic institutions as regards construction, supplies, etc., under defense and war program. *Youth.*—Bishop Duffy, Buffalo, N.Y., chairman. Facilitated exchange of information on youth work and acted as federating agency for Catholic youth groups.

Committees, each headed by a bishop, directed the Confraternity of Christian Doctrine, Motion Picture Legion of Decency, Catholic relief and refugee work, Catholic missions, Decent Literature organization, Mexican seminary.

National offices are located at the Catholic university, Washington, D.C. The N.C.W.C. issues a monthly publication, *Catholic Action*. (F. X. T.)

Catholic Youth Organization.

The Catholic Youth organization (CYO) was established in Chicago in 1930. Its founder was Bishop Bernard J. Sheil, auxiliary bishop and vicar-general to Cardinal Mundelein. At the time of its founding in the beginning of the eco-

nomic depression of 1929, the CYO's primary objective—an objective that still remained fundamental despite the broader social-conscious complexion of the CYO program of later years—was to promote among Catholic youth a recreational and religious program that would adequately meet the physical and spiritual needs of out-of-school Catholic boys and girls.

Indirectly, a corollary aim was to help decrease the crime and delinquency among the polyglot youthful populations of Chicago's industrial areas, which were among the first to suffer from the depression.

To a great degree the Catholic Youth organization, in Chicago as well as in other parts of the country where the general idea was quickly adopted, fulfilled its original aims, and tens of thousands of young Catholics chiefly out-of-school were in 1941 participating in extensive and well-organized recreational activities under the supervision of their parish priests. As a result of the widespread acceptance of the CYO idea and the rapid establishment of similar groups in scores of towns and cities throughout the United States and even in Canada, the influence exerted by the CYO was nation-wide. Even Hawaii established a Catholic Youth organization patterned after the Chicago CYO.

Historically, the effort to provide Catholic youth with an interesting and wholesome program of constructive recreation, whether physical, social, spiritual or intellectual, established a precedent in Catholic circles. The Catholic Church in 1930 reached an agreement with the Boy Scouts of America providing for the establishment of a scouting program for the 5,000,000 Catholic boys and girls of the country. Stemming from a purely democratic ideal, the CYO was dedicated to the principle that boys and girls recognize no religious or ideological cause that fails to be rooted in Christian democratic heritage. Its conception of youth at work and at play, widely disseminated through the press and over the radio, helped to dramatize the cause of U.S. youth during the decade 1930–1940 as perhaps nothing else did. Among the institutions maintained by the Chicago CYO as of 1941 for the benefit of its youthful members were the CYO-Lewis School of Aeronautics, the CYO West Side Community centre, the CYO hotels for youthful parolees and transients and the CYO Working Boys' home. Of the numerous recreational activities sponsored by the CYO, the most interesting perhaps are classes in radio technique and radio dramatics, study clubs for social action, gliding, boxing, speed ice skating, baseball, softball, outdoor camps for needy youngsters and vacation schools during the summer months. (B. J. S.)

Cattle. The number of cattle and calves on United States farms at the end of 1941 was estimated by the department of agriculture as about 2,000,000 more than the 71,666,000 head on farms at the end of 1940.

Cattle increased after 1938 and began the year 1942 close to the peak of 1934. Slaughter of cattle in 1941 was 10,945,906 head, and 9,756,130 head in 1940, with a five-year (1936–40) average annual slaughter of 10,003,921 head. Slaughter of calves in 1941 was 5,561,042 head, compared with 5,358,695 in 1940 and a five-year average of 5,693,055. The foregoing figures apply to packing plants under federal inspection. The general level of cattle prices averaged about $1 higher in 1941 than in 1940. Choice grade slaughter steers were lower during the last four months of 1941 than in 1940, but through most of the year lower grades of slaughter steers and feeder cattle were higher. The number of cattle on feed Jan. 1 was approximately the same in 1941 and 1940. The 1942 goals of increased production of most agricultural products, as requested by the United States department of agriculture, did not call for any increase in the number of cattle. Instead, it recommended that slaughter of cattle be increased about 12% in 1942 over 1941. This increase in beef production can be achieved without decreasing the numbers of breeding stock. The need for increased meat production in defense activity is large, and the economic position of the cattle industry would be improved if the increasing numbers of cattle were checked The United States' trade agreement with Argentina held particular interest to the cattle industry. Under the tariff of 1930, imports of canned, pickled or cured beef paid a duty of 6 cents per lb., but not less than 20% ad valorem. The agreement changed the 6 cent duty to 3 cents, but retained the 20% ad valorem provision. Production of canned beef in the United States is small, and the domestic demand has been met to a considerable extent by imports from Argentina, Brazil, Uruguay and Paraguay. During the six years ending in 1940 these imports ran from 61,000,000 to 88,000,000 lb. annually. Imports of cattle and calves from Canada during the first nine months of 1941 were 177,000 head, approximately the same as in the first nine months of 1940. Imports from Mexico for the corresponding periods were 384,000 head in 1941 and 301,000 head in 1940. The increase in imports was represented chiefly by lightweight stockers and feeders on which an import duty of 2.5 cents per lb. was paid. Slaughter of beef cattle in Argentina and Uruguay increased 9% the first eight months in 1941, and exports from those countries and Brazil again moved upward for the first time since the fall of France in 1940. Argentina, the leading beef-exporting country of the world, has soil and climate conditions that provide for the most economical production of cattle. (*See* also MEAT.)
(S. O. R.)

CCC: *see* CIVILIAN CONSERVATION CORPS *or* COMMODITY CREDIT CORPORATION.

Celebes Islands: *see* DUTCH EAST INDIES; NETHERLANDS COLONIAL EMPIRE.

Cellulose Products. Emergency and blockade conditions in 1941 created unbalance in the production and application of cellulose products. In Canada and the United States an increased demand for paper, both for domestic use and for export to Great Britain and Latin America, speeded up production of wood pulp to capacity. Augmented production of nitro-cellulose explosives, as well as of rayon, dopes, films and plastics, increased the demand for cotton linters as a source of chemical cellulose.

Contrasted with this, but resulting from the same conditions, was the growing use of wood as a substitute material in Sweden for products no longer obtainable by import; several layers of water-impermeable corrugated board served as insulation in refrigerators in place of cork. Tablecloths, handkerchiefs and even ambulance materials were being made of paper in Sweden to save textiles and soap. In Great Britain the use of paper was prohibited for tablecloths, facial tissues, paper cups, etc., while in the United States many thousands of dollars' worth of paper cups were ordered for army use. Related difficulties in the paper industry arose from priorities in the United States of chemicals such as chlorine, caustic soda and formaldehyde, needed for defense purposes and also for export, particularly in view of heavy demands for chemicals in Russia, while Norway was faced with the problem of finding substitutes for rosin size and alum. Sodium silicate and glue were used in part to replace rosin but no satisfactory substitute for alum was found. In line with the conservation of materials, a general policy was to collect and save waste paper; new methods for de-inking continued to be patented. Economy was also practiced in the greater recovery of by-products, such as calcium lignin sulphate from sulphite liquor.

In the United States it was proved experimentally that considerable quantities of low-cost hardwoods could be used in the manufacture of newsprint. In Germany a method for preparing cellulose from the outer layers of cornstalks was found to be easier than its preparation from wood; potato tops mixed with straw proved suitable for the manufacture of coated paper. In India some grades of rice straw yielded 44% of paper pulp. Biological pretreatment of elephant grass and waste from harvested banana plants made possible an increased yield of cellulose. Alginic acid obtained from seaweed abundant along the shores of Scotland and Ireland was made into rayon with the same machinery used for viscose rayon, at a considerably lower cost.

By a new process which should prove of particular value in China, pulp was produced from bamboo, satisfactory for the same purposes as sulphite pulp from wood. The bamboo is treated with an aqueous salt solution such as that of sodium xylenesulphonate, this liquor being recovered and repeatedly re-used. A chemical suitable for bleaching wood pulp, cotton, viscose rayon, acetate rayon, straw, jute and hemp is sodium chlorite, $NaClO_2$. This is a strong enough oxidizing agent to destroy colouring matter but, unlike hypochlorite, is not strong enough to damage fibres.

Increased use of cellulose products was noted in the replacing of metal foil in the food industry by glassine paper; also of silk in the hosiery industry by rayon yarn. (*See* also PAPER AND PULP INDUSTRY; PLASTICS INDUSTRY; RAYON.)

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(C. T. S.)

Cement. New building construction for the defense program was responsible for a greatly increased demand for cement, and led to marked increases in output, especially so in 1941.

Production of all types of cement in the U.S. in 1940 increased 6% over 1939, to 132,751,100 bbl., while shipments were 132,864,400 bbl. and apparent consumption 131,734,800 bbl. Early in 1941 the increase became so much more pronounced that production of portland cement alone, which accounts for about 98% of the total, was 135,241,000 bbl. in the first ten months of the year, or more than in the full year of 1940. This should bring the total for 1941 to about 170,000,000 bbl., and shipments for the year would approximate 176,000,000 bbl., to each of which figures is to be added about 3,000,000 bbl. of special types of cement, giving a grand total which might establish a new record high in shipments, replacing the 178,507,000 bbl. in 1928. With shipments increasing faster than output, and in the lead since the end of the first quarter, there was a corresponding decrease in stocks, which at the end of October had dwindled to less than the shipments made in any month since April, instead of the usual equivalent of three months' supply. Imports were reduced well below the former level of 2,000,000 bbl., and exports were increased by demand from countries cut off from European shipments, resulting in net exports of more than 1,000,000 bbl. in 1940, as against a normal net import. (*See* also GYPSUM.) (G. A. Ro.)

Censorship: *see* LAW: *National Defense: Freedom of Speech.*

Census, 1940. The sixteenth decennial census of the United States was taken as of April 1, 1940. The enumeration was largely completed during the months of April and May, though additional field work was done in scattered areas

Table I.—*Population in Groups of Places Classified According to Size, and in Unincorporated Rural Territory, for the United States, 1940 and 1930*

(A minus sign [—] denotes decrease in number of places)

Area and Class of Places	1940			1930			Change in Number of Places, 1930–40		
	Number of Places	Population	Per Cent of Total Population	Number of Places	Population	Per Cent of Total Population	Number Added	Number Taken Out	Net Change
Continental United States	..	131,669,275	100.0	..	122,775,046	100.0	..	..	..
Urban territory	3,464	74,423,702	56.5	3,165	68,954,823	56.2	344	45	299
Places of 1,000,000 or more	5	15,010,866	12.1	5	15,064,555	12.3	..	..	..
Places of 500,000 to 1,000,000	9	6,450,959	4.9	8	5,763,987	4.7	1	..	1
Places of 250,000 to 500,000	23	7,827,514	5.9	24	7,956,228	6.5	1	2	—1
Places of 100,000 to 250,000	55	7,792,050	5.9	56	7,540,966	6.1	3	4	—1
Places of 50,000 to 100,000	107	7,343,917	5.6	98	6,491,448	5.3	15	6	9
Places of 25,000 to 50,000	213	7,417,093	5.6	185	6,425,693	5.2	42	14	28
Places of 10,000 to 25,000	605	9,966,898	7.6	606	9,097,200	7.4	109	50	59
Places of 5,000 to 10,000	965	6,681,804	5.1	851	5,807,156	4.8	236	122	114
Places of 2,500 to 5,000	1,422	5,025,911	3.8	1,332	4,717,590	3.8	344	254	90
Rural territory	..	57,245,573	43.5	..	53,820,223	43.8	..	..	..
Incorporated places of 1,000 to 2,500	3,205	5,020,834	3.8	3,087	4,820,707	3.9	561	443	118
Incorporated places under 1,000	10,083	4,315,843	3.3	10,346	4,362,746	3.6	566	829	—263
Unincorporated territory	..	47,902,896	36.4	..	44,636,770	36.4	..	..	..

all through the summer and into the early fall. The first, and in one sense the most fundamental, process in the utilization of the census returns is the count of the population. This serves as a basis for the apportionment of representation in congress and must be completed by the first of December of the census year. From this count are obtained figures representing the total population of every geographic area recognized by the census, ranging from states, cities and counties down through townships, to the very smallest incorporated villages. The second major process through which the census returns must go is the coding of the schedules and the punching of the cards for machine tabulation. The third process is the actual tabulation of these cards and the preparation of the results for publication. In the tables following are presented some of the results of the first series of tabulations of the 1940 population cards, these figures being summaries for the United States of tabulations made in most cases for about 18,000 areas, comprising all urban places, the rural-farm and rural-nonfarm parts of all counties and various subdivisions of the larger cities.

Urban and Rural Areas.—The urban population comprises in general all persons living in incorporated places (cities, towns, villages or boroughs) having a population of 2,500 or more, while the rural population is made up of persons living outside such places. The rural population is further subdivided into farm and nonfarm, the rural-farm population comprising all persons living on farms in rural territory, without regard to occupation, and the rural-nonfarm comprising the remainder of the rural population.

The urban and rural areas may be further subdivided so as to separate the larger cities from the smaller, and the rural incorporated places from the unincorporated territory. Figures showing such a distribution for 1940 and 1930 are in Table I.

There were 3,464 urban places in the United States in 1940, as compared with 3,165 in 1930. These were mainly incorporated places of 2,500 or more, with a few unincorporated areas (townships, etc.) that were classified as urban on the basis of special qualifications such as extreme density of population. The increase in the number of urban places is the net result of the addition of 344 new places in the 1940 data and the dropping of 45 places from the 1930 list. Most of the 344 new urban places were incorporated places that attained a population of 2,500 or more during the decade and thus qualified as urban, but 20 of them were places not incorporated until after 1930. Of the 45 places taken off the urban list most were dropped because of decreases to below the 2,500 limit, but a few disappeared through annexation to other urban places or disincorporation.

The urban-rural distribution of the population did not change materially between 1930 and 1940, the percentage urban having increased only from 56·2 in 1930 to 56·5 in 1940. There were appreciable changes, however, in the farm and nonfarm subdivisions of the rural area. The rural-nonfarm population increased 14·2% (or much more rapidly than even the urban) during the decade ending in 1940, while the rural-farm population increased only 0·2%, as a result of which the percentage rural-nonfarm increased from 19·3 in 1930 to 20·5 in 1940 and, conversely, the percentage rural-farm decreased from 24·6 in 1930 to 22·9 in 1940.

Table II.—*Present and Prospective Congressional Apportionments as Determined by the Census of 1940, Using the Method of Equal Proportions*

(To be effective in the congress of 1943)

State	Present	New	State	Present	New
Alabama	9	9	Nebraska	5	4
Arizona	1	2	Nevada	1	1
Arkansas	7	7	New Hampshire	2	2
California	20	23	New Jersey	14	14
Colorado	4	4	New Mexico	1	2
Connecticut	6	6	New York	45	45
Delaware	1	1	North Carolina	11	12
Florida	5	6	North Dakota	2	2
Georgia	10	10	Ohio	24	23
Idaho	2	2	Oklahoma	9	8
Illinois	27	26	Oregon	3	4
Indiana	12	11	Pennsylvania	34	33
Iowa	9	8	Rhode Island	2	2
Kansas	7	6	South Carolina	6	6
Kentucky	9	9	South Dakota	2	2
Louisiana	8	8	Tennessee	9	10
Maine	3	3	Texas	21	21
Maryland	6	6	Utah	2	2
Massachusetts	15	14	Vermont	1	1
Michigan	17	17	Virginia	9	9
Minnesota	9	9	Washington	6	6
Mississippi	7	7	West Virginia	6	6
Missouri	13	13	Wisconsin	10	10
Montana	2	2	Wyoming	1	1

Apportionment.—The law under which the representation of the various states in the house of representatives is reapportioned on the basis of each succeeding decennial census was amended in an act of congress approved Nov. 15, 1941, to the effect that future reapportionments are to be made by the method

Table III.—*Population by Race for the United States, 1940 and 1930, and for the North, South and West, 1940*

(The figures for white population in 1930 have been revised to include Mexicans, who were classified with "Other Races" in the 1930 census reports)

Race	The United States				The North 1940		The South 1940		The West 1940	
	Number		Per Cent							
	1940	1930	1940	1930	Number	Per Cent	Number	Per Cent	Number	Per Cent
All classes	131,669,275	122,775,046	100.0	100.0	76,120,109	100.0	41,665,901	100.0	13,883,265	100.0
White	118,214,870	110,286,740	89.8	89.8	73,206,738	96.2	31,658,578	76.0	13,349,554	96.2
Native	106,795,732	96,303,335	81.1	78.4	63,836,960	83.9	31,032,902	74.5	11,925,870	85.9
Foreign born	11,419,138	13,983,405	8.7	11.4	9,369,778	12.3	625,676	1.5	1,423,684	10.3
Negro	12,865,518	11,891,143	9.8	9.7	2,790,193	3.7	9,904,610	23.8	170,706	1.2
Other races	588,887	597,163	0.4	0.5	123,178	0.2	102,704	0.2	363,005	2.6
Indian	333,969	332,397	0.3	0.3	83,136	0.1	94,139	0.2	156,694	1.1
Chinese	77,504	74,954	0.1	0.1	25,738	..	4,926	..	46,840	0.3
Japanese	126,947	138,834	0.1	0.1	4,971	..	1,049	..	120,927	0.9
Filipino	45,563	45,208	..	..	8,126	..	2,351	..	35,086	0.3
Hindu	2,405	3,130	..	..	597	..	169	..	1,639	..
Korean	1,711	1,860	..	..	350	..	40	..	1,321	..
All other	788	780	..	..	200	..	30	..	498	..

of equal proportions, this being one of two alternative methods under the law as it previously stood (the other method being that of major fractions). The method of equal proportions is one under which, after each state is assured of one representative, the additional representatives are so assigned that the average population per representative shows the least possible variation as between one state and another.

Under this method California gains three representatives and six other states, namely, Arizona, Florida, New Mexico, North Carolina, Oregon and Tennessee each gains one. To balance these gains, since the number of representatives in the house is not to be changed, the following nine states each loses one representative, namely, Illinois, Indiana, Iowa, Kansas, Massachusetts, Nebraska, Ohio, Oklahoma and Pennsylvania. The complete apportionment is shown in Table II.

Race and Nativity.—The white population formed practically the same percentage of the total population in 1940 as in 1930, the percentage being 89·8 in both years and the rate of increase for the white population being the same (to the nearest tenth of one percent), namely, 7·2. The native white population taken alone, however, increased by 10.9%, while the foreign-born white population decreased by 18.3%. As the result of these differentials, the percentage which the native white population formed of the total increased from 78.4 in 1930 to 81.1 in 1940, while the percentage represented by the foreign-born white population declined from 11.4 to 8.7. The main reasons for the rapid decline in the number of foreign born are two, namely, the fact that during this decade the net immigration was a minus quantity (there being a net emigration of nearly 50,000), and the relatively high mortality rates prevailing among the foreign born because of their high average age. (The median age of the foreign-born white was 43.9 in 1930 and had increased to 51.0 by 1940.)

The Negro population increased 8.2%, or materially less than the native white, between 1930 and 1940, and the minor nonwhite races collectively showed a decrease of 1.4%.

The most important of the changes in the minor nonwhite races was perhaps the decrease from 138,834 to 126,947, or 8.6%, in the Japanese population. Of the total Japanese population in 1940, 47,305, or somewhat more than one-third, were foreign born (for the most part born in Japan), and therefore alien and ineligible for citizenship. The remainder were classified as native on the basis of birth in the United States or in some one of its territories and possessions. Nearly nine-tenths of all the Japanese in the United States were in the three Pacific coast states; in fact, 93,717, or almost three-quarters of the total, were in California alone and 23,321, or about one-quarter of the California total, were in the city of Los Angeles. In addition there were 157,905 Japanese in Hawaii, including 37,353 foreign born, and in the Philippine islands about 30,000 foreign-born Japanese plus an unrecorded number born in the islands.

The figures representing the population classified by race and nativity are summarized in Table III.

The geographic distribution of the several race and nativity classes is by no means uniform. The population of both the north (comprising all the states as far west as the Dakotas and Kansas and as far south as Pennsylvania, Indiana and Missouri) and the west (comprising the states from Montana south to New Mexico and westward) was 96.2% white in 1940; while the population of the south (comprising the states from Delaware, Kentucky and Oklahoma southward) was only 76.0% white. The foreign-born whites formed 12.3% of the population in the north, 10.3% in the west, and only 1.5% in the south. More than three-fourths of the Negroes were in the south, where they formed 23.8% of the population; a little more than one-fifth were in the north (mainly in the cities), where they formed 3.7% of the population; and only a small number in the west, where they formed 1.2% of the population. The other nonwhite races were concentrated in the west, where they formed 2.6% of the total, as against a small fraction of one percent in the north and the south.

Country of Birth of the Foreign Born.—The total number of foreign-born white persons in the United States in 1940 was materially less, as already indicated, than in 1930. The figures shown in Table IV, which distributes the foreign-born white by country of birth, indicate that this decrease was shared rather generally by the foreign-born white from almost all the major source countries. The decrease shown for all countries combined is 18.3%; for three countries, namely, Wales, Northern Ireland and Mexico, a decrease of more than 40% is indicated; while for only four countries are increases shown. The number of German-born in the country decreased from 1,608,814 in 1930 to 1,237,772 in 1940, or 23.1%; and the number of Italian-born from 1,790,424 to 1,623,580, or 9.3%. The more rapid decrease in the German-born probably results from the much higher average age of that group as compared with the Italian-born. The foreign-born white from American sources included 1,044,119 from Canada (273,366 of French stock and 770,753 of other origin, mainly English or other British), with 21,361 from Newfoundland, 377,433 from Mexico, 30,534 from Cuba and other West Indies, and 36,408 from Central and South America, or 1,509,855 in all.

Sex Distribution.—In the total population of the United States the numbers of males and females are rather rapidly approaching equality. In 1910, partly as the result of the recent arrival of large numbers of European immigrants, who were then predominantly male, there were 106.0 males per 100 females in the total population of continental United States and 129.2 in the foreign-born white population taken alone. By 1920 the sex ratio had declined to 104.0 (with 121.7 for the foreign-born white) and by 1930 to 102.5 (with 115.1 for the foreign-born white). The 1940 tabulation shows 66,061,592 males and 65,607,683 females in the total population, or 100.7 males per 100 females; or to state the situation in another way, there were in 1940 only 453,909 more males than females, as compared with an excess of 1,499,114 in 1930. For the foreign-born white alone, in 1940, the sex ratio was 111.1 and the excess of males amounted to 602,892—this figure being partly offset by a large excess of females in the Negro population (sex ratio 95.0), to give the smaller figure just quoted for the general population.

The sex distribution of the population of the United States and of the urban and rural areas is given, for 1940 and 1930, in Table V.

The urban-rural distribution of the male population differs materially from that of the female population. In 1940, for example, 58.0% of the females were in urban areas, as compared with 55.0% of the males; and conversely, 24.1% of the males were in rural-farm territory, as compared with 21.8% of the females. These relations are perhaps brought out even more clearly by the sex ratios, which were 95.5 males per 100 females in the urban area, 103.7 in the rural-nonfarm area, and 111.7 in the rural-farm. The excess of females in the urban population (and this is characteristic of the population of most individual cities as well as of the urban total) is mainly the result of the fact that the cities offer more occupational opportunities for women than the farming areas; and the excess of males in the latter is, conversely, the result of the fact that the farming areas provide more jobs for men than for women.

Age Composition.—With respect to age as well as sex the 1940 census figures record another stage in a long-time trend which has been observed in the population of the United States. The population is steadily and rather rapidly growing older. The median age in 1940 for the entire population was 29.9 years, as compared with 26.4 years in 1930. (The

Table IV.—*Foreign-born White in the United States by Country of Birth, 1940 and 1930*

(The figures for 1930 have been revised to include Mexicans, who were classified with "Other races" in the 1930 census reports)

Country of Birth	The United States		
	1940	1930	Per Cent of Increase
All countries	11,419,138	13,983,405	−18.3
England	621,975	808,684	−23.1
Scotland	279,321	354,323	−21.2
Wales	35,360	60,205	−41.3
Northern Ireland	106,416	178,832	−40.5
Irish Free State (Eire)	572,031	744,810	−23.2
Norway	262,088	347,852	−24.7
Sweden	445,970	595,250	−25.2
Denmark	138,175	179,474	−23.0
Netherlands	111,064	133,133	−16.6
Belgium	53,958	64,194	−15.9
Luxembourg	6,886	9,048	−23.9
Switzerland	88,293	113,010	−21.9
France	102,930	135,265	−23.9
Germany	1,237,772	1,608,814	−23.1
Poland	903,479	1,268,583	−21.7
Czechoslovakia	319,971	491,638	−34.9
Austria	479,906	370,914	29.4
Hungary	290,228	274,450	5.7
Yugoslavia	161,093	211,416	−23.8
Russia (U.S.S.R.)	1,040,884	1,153,624	− 9.8
Lithuania	105,771	103,601	−14.4
Latvia	18,036	20,673	− 9.9
Finland	117,210	142,478	−17.7
Rumania	115,931	146,303	−20.8
Bulgaria	8,888	9,300	− 5.4
Turkey in Europe	4,412	2,257	95.5
Greece	163,250	174,526	− 6.5
Italy	1,623,580	1,790,424	− 9.3
Spain	47,707	59,033	−19.2
Portugal	62,347	69,993	−10.9
Other Europe	26,101	31,379	−16.8
Palestine and Syria	57,906	63,362	− 8.6
Turkey in Asia	52,479	46,651	12.5
Other Asia	39,524	47,567	−16.9
Canada—French	273,366	370,852	−26.3
Canada—other	770,753	907,660	−15.1
Newfoundland	21,361	23,071	−10.9
Mexico	377,433	639,017	−40.9
Cuba and other West Indies	30,534	31,600	− 3.4
Central and South America	36,408	38,124	− 4.5
Australia	10,998	12,720	−13.5
Azores	25,751	35,432	−27.3
All other and not reported	21,892	22,769	− 3.9

Table V.—*Urban and Rural Population of the United States, by Sex, 1940 and 1930*

Census Year and Area	Number			Per Cent			Males per 100 females
	Total	Male	Female	Total	Male	Female	
1940							
Total	131,669,275	66,061,592	65,607,683	100.0	100.0	100.0	100.7
Urban	74,423,702	36,363,706	38,059,996	56.5	55.0	58.0	95.5
Rural-nonfarm	27,029,385	13,757,516	13,271,869	20.5	20.8	20.2	103.7
Rural-farm	30,216,188	15,940,370	14,275,818	22.9	24.1	21.8	111.7
1930							
Total	122,775,046	62,137,080	60,637,966	100.0	100.0	100.0	102.5
Urban	68,954,823	34,154,760	34,800,063	56.2	55.0	57.4	98.1
Rural-nonfarm	23,662,710	12,117,945	11,544,765	19.3	19.5	19.0	105.0
Rural-farm	30,157,513	15,864,375	14,293,138	24.6	25.5	23.6	111.0

Table VI.—*Population of the United States by Age, Race and Nativity, 1940 and 1930*

Age	All Classes			Native White		Foreign-born White		Negro		Other Races	
	1940	1930	Per Cent of Increase	1940	1930	1940	1930	1940	1930	1940	1930
All ages	131,669,275	122,775,046	7.2	106,795,732	96,303,335	11,419,138	13,983,405	12,865,518	11,891,143	588,887	597,163
Under 5 years	10,541,524	11,444,300	— 7.9	9,221,184	10,108,160	8,321	34,009	1,249,080	1,230,206	62,939	72,015
5 to 9 years	10,684,622	12,607,609	—15.3	9,307,367	11,019,290	21,584	142,373	1,294,546	1,368,381	61,125	77,565
10 to 14 years	11,745,935	12,004,877	— 2.2	10,298,944	10,515,890	53,751	178,534	1,330,660	1,251,542	62,580	58,911
15 to 19 years	12,333,523	11,552,115	6.8	10,799,262	9,871,673	164,785	377,106	1,304,606	1,250,528	64,870	52,808
20 to 24 years	11,587,835	10,870,378	6.6	10,130,640	8,865,481	209,509	747,188	1,195,227	1,203,191	52,459	54,518
25 to 29 years	11,096,638	9,833,608	12.8	9,479,994	7,594,066	424,276	1,114,932	1,145,284	1,071,787	47,084	52,823
30 to 34 years	10,242,388	9,120,421	12.3	8,497,387	6,890,102	700,091	1,320,810	992,879	864,514	43,031	44,995
35 to 39 years	9,545,377	9,208,645	3.7	7,468,265	6,575,837	1,048,395	1,702,431	985,833	890,900	42,884	39,477
40 to 44 years	8,787,843	7,990,105	10.0	6,673,013	5,520,992	1,263,070	1,745,000	815,096	687,423	36,664	35,880
45 to 49 years	8,255,225	7,042,279	17.2	6,028,851	4,771,518	1,503,905	1,610,052	692,807	630,065	29,662	30,644
50 to 54 years	7,256,846	5,975,804	21.4	5,114,739	4,100,613	1,565,568	1,345,130	550,435	504,590	26,104	25,471
55 to 59 years	5,843,865	4,645,677	25.8	4,108,095	3,270,825	1,318,750	1,048,476	397,219	309,397	19,801	16,979
60 to 64 years	4,728,340	3,751,221	26.0	3,347,818	2,570,884	1,068,875	925,893	295,004	242,169	15,743	12,275
65 to 69 years	3,806,657	2,770,605	37.4	2,686,518	1,885,234	812,528	721,899	296,737	155,177	10,874	8,295
70 to 74 years	2,569,532	1,950,004	31.8	1,798,386	1,378,971	602,159	466,351	162,948	99,096	6,039	5,586
75 years and over	2,643,125	1,913,196	38.2	1,835,269	1,295,013	644,571	491,605	156,257	118,446	7,028	7,232
Not reported	..	94,022	..	..	67,886	..	10,716	..	13,731	..	1,689
	Per Cent										
All ages	100.0	100.0	..	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Under 5 years	8.0	9.3	..	8.6	10.5	0.1	0.2	9.7	10.3	10.7	12.1
5 to 9 years	8.1	10.3	..	8.7	11.4	0.2	1.0	10.1	11.5	10.4	13.0
10 to 14 years	8.9	9.8	..	9.6	10.9	0.5	1.3	10.3	10.5	10.6	9.9
15 to 19 years	9.4	9.4	..	10.1	10.2	1.4	2.7	10.1	10.5	11.0	8.8
20 to 24 years	8.8	8.9	..	9.5	9.2	1.8	5.3	9.3	10.1	8.9	9.1
25 to 29 years	8.4	8.0	..	8.9	7.9	3.7	8.0	8.9	9.0	8.0	8.8
30 to 34 years	7.8	7.4	..	8.0	7.2	6.2	9.4	7.7	7.3	7.3	7.5
35 to 39 years	7.2	7.5	..	7.0	6.8	9.2	12.2	7.7	7.5	7.3	6.6
40 to 44 years	6.7	6.5	..	6.2	5.7	11.1	12.5	6.3	5.8	6.2	6.0
45 to 49 years	6.3	5.7	..	5.6	5.0	13.2	11.5	5.4	5.3	5.0	5.1
50 to 54 years	5.5	4.9	..	4.8	4.3	13.7	9.6	4.3	4.2	4.4	4.3
55 to 59 years	4.4	3.8	..	3.8	3.4	11.5	7.5	3.1	2.6	3.4	2.8
60 to 64 years	3.6	3.1	..	3.1	2.7	9.4	6.6	2.3	2.0	2.7	2.1
65 to 69 years	2.9	2.3	..	2.5	2.0	7.1	5.2	2.3	1.3	1.8	1.4
70 to 74 years	2.0	1.6	..	1.7	1.4	5.3	3.3	1.3	0.8	1.0	0.9
75 years and over	2.0	1.6	..	1.7	1.3	5.6	3.5	1.2	1.0	1.2	1.2
Not reported	..	0.1	..	..	0.1	..	0.1	..	0.1	..	0.3

median age is the age of the person who would stand in the middle of the series if the entire population were arranged in order according to age; in effect, one-half the people are younger than the median age and one-half older.) The median age has been rising steadily ever since 1820, the earliest census for which age data for the entire population are available, at which time the median age was 16.7 years.

Table VI gives the age distribution at the last two censuses for the total population of the United States and its major race and nativity classes, with the percentage of increase for each age group in the total population.

One outstanding feature in the changing age distribution of the population as a whole is the actual decrease in the age groups representing persons under 15 years of age and the very rapid increase in the numbers of persons in the more advanced ages. The number of persons under 15 years of age was actually smaller by 3,084,795, or 8.6%, in 1940 than in 1930, while the number of persons 65 years old and over was larger in 1940 than in 1930 by 2,385,509, or 36.0%. These changes in the age composition result from a declining birth rate on the one hand and, on the other, from improved mortality conditions, which enable more persons to survive to the higher ages. If present conditions continue, the number and proportion of young persons may be expected to decrease still further, while the number and proportion of older persons will, without question, go on increasing.

The changes in the relative distribution of the population with respect to age, which are shown in the lower part of Table VI, are for many purposes more significant than the changes in the absolute numbers. The percentage of the population under 15, for example, declined from 29.4 in 1930 to 25.0 in 1940, while the percentage 65 and over increased from 5.5 to 6.9; or, taking the native white population alone, in order to eliminate the effects of the somewhat abnormal age distribution of the foreign born, the percentage under 15 decreased from 32.8 in 1930 to 26.9 in 1940 and the percentage 65 and over increased from 4.7 to 5.9. In the Negro population, the next largest of the major classes, the changes were somewhat similar, though the decline in the percentages for persons under 15 was somewhat less than in the native white population and the relative increase in the percentages for persons 65 and over was somewhat greater.

The foreign-born white population is in a situation materially different with respect to age changes from that of the other classes, in that this class does not reproduce itself but must be recruited from outside sources; and, for the moment, the sources of outside recruits are very greatly restricted. While the total foreign-born white population decreased only 18.3%, the numbers of foreign-born white persons in all the age groups under 30 years of age decreased by more than 50%, while there was some increase in all the groups representing persons 50 years old and over. These differences in the absolute numbers are reflected in the percentage distributions which show for the foreign-born white smaller percentages in all the age groups up to age 45 and larger percentages in all the groups beyond this age.

The median age of the native white population in 1940 was 26.9 years, about two years below the median for the total population. The foreign-born whites, on the other hand, were as a group more than 20 years older, having a median age of 51.0 years. The Negroes, with a median age of 25.3 years, and the other nonwhite races, with a median of 24.1 years, were younger on the average than the native whites.

Urban residents had a higher median age than the total population, namely, 31.0 years as compared with 29.0 years. Rural-nonfarm residents had a lower median age (27.7 years) and rural-farm residents one still lower (24.4 years). These variations are in part, at least, functions of fertility differentials, which in turn influence the proportion of the total population in the younger age groups. Since urban residents have a much lower rate of natural increase than the rural population, there are relatively fewer children and the average age is higher. Migrants from rural areas, who are principally adults, also contribute to the higher median age of the urban population.

Years of School Completed.—With every successive census, the returns from the question on ability to read and write have shown a decrease in the proportion of illiterates. By 1940 illiteracy was so near the vanishing point in most states, except in the older population and in some special classes, that a question on the highest grade of formal schooling completed was substituted, with the object of measuring at least approximately the whole range of educational attainment among the American people. The first tabulation of the returns from this new question was limited to persons 25 years old and over, in order to avoid the complications involved in the interpretation of this information for persons who might still be in school. Later tabulations will be made for younger persons, giving the current educational attainment separately for those no longer at school and for those still attending school. The data for persons 25 years old and over are summarized in Table VII.

For the entire population 25 years old and over, according to the returns from this question, the median number of school years completed was 8.4; for the native whites, 8.8; for the foreign-born whites, 7.3; for the Negroes, 5.7; and for the other nonwhite races collectively, 6.8.

Table VII.—*Years of School Completed by Persons 25 Years Old and Over, by Race and Nativity, 1940*

Years of School Completed	All Classes		Native White		Foreign-born White		Negro		Other Races	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Persons 25 years old and over	74,775,836	100.0	57,038,335	100.0	10,961,188	100.0	6,491,333	100.0	284,980	100.0
No school years completed	2,799,923	3.7	764,384	1.3	1,335,011	12.2	646,225	10.0	53,703	18.8
Grade school: 1 to 4 years	7,304,689	9.8	3,457,673	6.1	1,764,440	16.1	2,033,931	31.3	48,639	17.1
5 and 6 years	8,515,111	11.4	5,513,101	9.7	1,569,134	14.3	1,393,030	21.5	39,837	14.0
7 and 8 years	25,897,953	34.6	20,558,596	36.0	3,988,207	36.4	1,280,630	19.8	64,421	22.6
High school: 1 to 3 years	11,181,995	15.0	9,842,214	17.3	761,378	6.9	549,661	8.5	28,742	10.1
4 years	10,551,681	14.1	9,447,826	16.6	807,507	7.4	268,481	4.1	27,867	9.8
College: 1 to 3 years	4,075,183	5.4	3,737,470	6.6	211,211	1.9	118,280	1.8	8,222	2.9
4 years or more	3,407,331	4.6	3,007,783	5.4	252,002	2.3	80,842	1.2	6,704	2.4
Not reported	1,041,970	1.4	649,288	1.1	271,602	2.5	114,235	1.8	6,845	2.4
Median school years completed	8.4	..	8.8	..	7.3	..	5.7	..	6.8	..
Per cent less than 5 years completed	13.5	..	7.4	..	28.3	..	41.3	..	35.9	..

Table VIII.—*Employment Status of Persons 14 Years Old and Over, by Race, Nativity and Sex, 1940*

	Total	All Classes				Native White		Foreign-born White		Negro		Other Races	
		Male		Female									
		Number	Per Cent	Number	Per Cent	Male	Female	Male	Female	Male	Female	Male	Female
Total population	131,669,275	66,061,592	..	65,607,683	..	53,437,533	53,358,199	6,011,015	5,408,123	6,269,038	6,596,480	344,006	244,881
Persons 14 years old and over	101,102,924	50,553,748	100.0	50,549,176	100.0	39,846,389	40,230,596	5,076,642	5,374,538	4,474,211	4,785,233	256,506	158,809
In labour force	52,789,499	39,944,240	79.0	12,845,259	25.4	31,377,403	9,903,910	4,790,163	1,007,913	3,582,005	1,807,186	194,609	36,250
Employed[1] (except on public emergency work)	45,166,083	34,027,905	67.3	11,138,178	22.0	26,803,122	8,645,342	4,128,384	918,241	2,936,795	1,542,273	159,604	32,322
On public emergency work[2] (WPA, NYA, etc.)	2,529,606	2,072,094	4.1	457,512	0.9	1,643,960	380,835	154,030	14,854	259,073	60,168	15,022	1,655
Seeking work[3]	5,093,810	3,844,241	7.6	1,249,569	2.5	2,930,321	967,733	507,740	74,818	386,137	204,745	20,043	2,273
Experienced workers	4,326,469	3,381,881	6.7	944,588	1.9	2,518,076	697,394	497,802	66,889	347,388	178,521	18,525	1,784
New workers[4]	767,341	462,360	0.9	304,981	0.6	412,245	270,339	9,848	7,929	38,749	26,224	1,518	489
Not in labour force	48,313,425	10,609,508	21.0	37,703,917	74.6	8,468,086	30,236,686	1,186,479	4,366,625	892,206	2,078,047	61,837	122,559
Engaged in own home housework	28,931,869	267,125	0.5	28,664,744	56.7	204,029	22,916,951	40,929	3,662,442	21,269	2,002,946	898	82,405
In school	9,013,342	4,593,630	9.1	4,419,712	8.7	4,161,434	3,938,510	58,853	52,203	343,372	404,344	29,071	24,565
Unable to work	5,268,727	2,966,225	5.9	2,302,502	4.6	2,023,445	1,538,508	669,588	414,793	259,950	342,431	13,242	6,710
In institutions[5]	1,176,093	767,474	1.5	409,519	0.8	524,089	301,779	113,481	68,741	125,195	37,850	4,709	1,149
Other and not reported[6]	3,922,494	2,015,054	4.0	1,907,440	3.8	1,555,989	1,540,878	303,628	168,356	142,420	190,476	13,017	7,730

[1]Persons who worked for pay or profit (except on public emergency work), or assisted without pay in a family enterprise, at any time during the week of March 24–30, 1940, and persons who had jobs (except on public emergency work), businesses or professional enterprises at which they did not work during the week of March 24–30, 1940, because of temporary illness, vacation, industrial dispute, bad weather or layoff not exceeding 4 weeks with instructions to return by a specific date.

[2]The number of persons reported in the census as on public emergency work was considerably below the number indicated by the records of the various emergency work agencies. It is probable that the majority of those on the WPA, CCC and NYA out-of-school programs who were not properly classified in the census were returned as employed in private or nonemergency government work. The great majority of students on the NYA student work program who were not properly classified were returned as in school.

[3]Persons not at private or nonemergency government work, nor on public emergency work, who were seeking work during the week of March 24–30, 1940.

[4]Persons seeking work who had not previously worked full time for one month or more at a single job.

[5]Inmates of penal institutions, hospitals for the mentally diseased or defective, and homes for the aged, infirm and needy.

[6]Includes some persons whose activity during the week of March 24–30, 1940, could not be definitely determined. Preliminary evidence concerning the characteristics of such persons indicates that the great majority of them were not in the labour force.

It may be noted further that 3.7% of all persons 25 years old and over had not completed even one full year of school and that a total of 13.5% had completed less than five years. These figures, of course, should be taken as an index of educational opportunities in times past rather than of the current situation.

On the other hand, 3,407,331 persons, or 4.6% of the whole number 25 years old and over, reported that they had completed four or more years of college. (This does not represent the whole number of college graduates, since there are in addition considerable numbers of college graduates under 25 years of age.) A still larger number (4,075,183) had completed from one to three years of college; 10,551,681 had completed four years of high school (but no college); and 11,181,995 had completed from one to three years of high school. Including those who had completed one or more years of college work, there were about 18,000,000 persons 25 years old and over, or 24.1% of the total, who had completed the high school course.

Employment Status.—Provision was made in the 1940 census for classifying all persons 14 years old and over according to activity during the week of March 24–30, 1940. Two large groups of much the same size were thus obtained: (a) Persons in the labour force, including those employed in private and nonemergency government work, those on public emergency work and those seeking work; and (b) persons not in the labour force, comprising those engaged in housework in their own homes, those in school, those unable to work, persons in institutions, and other persons not in the labour force, including a small number whose employment status was not reported.

The 1940 system of classification represents a considerable improvement over the practice in earlier censuses, in which all persons reporting a gainful occupation, regardless of activity in a particular period of time, were counted as gainful workers. It is to be noted, however, that the comparability of 1940 labour force figures with those for gainful workers in earlier censuses is somewhat affected by the 1940 change in basic concepts. It is possible that certain classes of persons, such as retired workers, some inmates of institutions, recently incapacitated workers, and seasonal workers neither working nor seeking work at the time of the census, were frequently included among gainful workers in 1930, but, in general, not included in the 1940 labour force. On the other hand, the 1940 labour force included new workers, that is, persons seeking work without work experience, few of whom were included in the 1930 gainful-worker group. Moreover, the 1940 aggregate included a considerable number of persons for whom occupation was not reported, a group that would have been entirely omitted by the 1930 approach.

Final census figures on employment status are presented in Table VIII for the population classified by race and nativity. The nation's labour force in the week of March 24–30, 1940, consisted of 52,789,499 persons, of whom 39,944,240 were males and 12,845,259 were females. Males in the labour force constituted 79.0% of all males 14 years old and over, whereas females in the labour force included only 25.4% of the corresponding age group. The proportion of males in the labour force did not vary greatly from one race-nativity group to another, but the proportion for women was variable, ranging from 18.6% for foreign-born white females to 37.8% for Negro females.

One of the most important reasons for subdividing the labour force is to separate the employed and the unemployed. The latter group would ordinarily be derived as the sum of persons on public emergency work programs and those seeking work. A satisfactory total for this purpose cannot be obtained from the census figures alone, however, because difficulties peculiar to the enumeration of public emergency workers resulted in the misclassification of a considerable number of such workers and a consequent understatement of their total number in the census returns. This difficulty can be largely eliminated through the substitution of official agency figures for census returns on the number of persons on the several federal emergency programs. On this basis, an estimate of the number of unemployed is obtained by adding to the 5,093,809 reported as seeking work the 2,906,196 persons on the pay rolls of federal agencies conducting public emergency work programs, excluding students on the NYA student-work program. The resulting total of about 8,000,000 provides a serviceable approximation of the total volume of unemployment in March 1940, although it is subject to a number of minor qualifications, of which perhaps the most important is that the total volume of unemployment may be slightly overstated because some of the misclassified persons might be counted twice, once in the census total for "seeking work," and once in the official agency figure.

One innovation in the 1940 census, the classification of nonworkers by status, is especially timely because of the unusual demands placed upon the U.S. labour supply by the marked growth of wartime production and the necessity for replacing men drawn into the armed forces. Important evidence concerning the types of nonworkers most likely to be drawn into the labour force is available from that part of Table VIII which shows the subdivisions of the 48,313,425 persons not in the labour force. It is clear that the total number of additional males available for work is relatively small, since all but about one-fifth of those 14 years old and over were already in the labour force, and the great majority of the remainder were unable to work or were in institutions or attending school. Some transfers to the labour force are possible from the older members of the group attending school, as well as from the 2,015,054 persons included in the category "Other and not reported," but the total number probably would not be large enough to constitute an important addition to the total labour force.

In the case of women, on the other hand, three-fourths of those 14 years old and over were outside the labour force. By far the largest category of such women consisted of those engaged in housework in their own homes, a group numbering 28,664,744. Many of this group could not shift to the labour force because of age, responsibility for care of minor children or other dependents, and similar reasons, but the number potentially available

Table IX.—*Employed Workers by Major Occupation Group and Sex, for Urban and Rural Areas, 1940*

Occupation Group	The United States				Urban		Rural-Nonfarm		Rural-Farm	
	Male		Female							
	Number	Per Cent	Number	Per Cent	Male	Female	Male	Female	Male	Female
Employed (except on public emergency work)	34,027,905	100.0	11,138,178	100.0	19,278,267	8,314,300	6,204,203	1,753,267	8,545,435	1,070,611
Professional workers	1,511,118	4.4	1,370,474	12.3	1,132,913	966,742	315,350	269,762	62,855	133,970
Semiprofessional workers	364,209	1.1	99,187	0.9	293,243	84,343	60,535	11,958	10,401	2,886
Farmers and farm managers	4,991,715	14.7	151,899	1.4	70,556	3,557	126,276	4,008	4,794,883	144,334
Proprietors, managers and officials, except farm	3,325,767	9.8	423,520	3.8	2,415,248	304,024	772,336	101,515	138,183	17,981
Clerical, sales and kindred workers	4,360,648	12.8	3,156,982	28.3	3,611,743	2,702,170	619,764	362,428	129,141	92,384
Craftsmen, foremen and kindred workers	4,949,132	14.5	106,590	1.0	3,592,956	90,595	1,075,578	12,749	280,598	3,246
Operatives and kindred workers	6,205,898	18.2	2,046,379	18.4	4,261,024	1,633,615	1,524,737	318,981	420,137	93,783
Domestic service workers	142,231	0.4	1,969,083	17.7	95,095	1,362,991	34,846	392,081	12,290	214,011
Service workers, except domestic	2,196,695	6.5	1,261,639	11.3	1,733,638	1,001,948	412,808	210,656	50,249	49,035
Farm labourers (wage workers) and farm foremen	1,828,164	5.4	96,726	0.9	126,259	8,197	342,716	18,758	1,359,189	69,771
Farm labourers, unpaid family workers	941,841	2.8	223,279	2.0	4,835	2,279	11,854	2,485	925,152	218,515
Labourers, except farm	2,965,693	8.7	98,435	0.9	1,792,261	60,500	850,540	20,406	322,892	8,529
Occupation not reported	244,734	0.7	133,985	1.2	148,496	84,339	56,863	27,480	30,375	22,166

Table X.—Employed Workers by Industry Group and Sex, 1940

Industry Group	Total	Male		Female	
		Number	Per Cent	Number	Per Cent
Employed (except on public emergency work)	45,166,083	34,027,905	100.0	11,138,178	100.0
Agriculture, forestry and fishery	8,475,432	7,988,343	23.5	487,089	4.4
Agriculture	8,372,222	7,886,849	23.2	485,373	4.4
Forestry (except logging) and fishery	103,210	101,494	0.3	1,716	..
Mining	913,000	902,061	2.7	10,930	0.1
Coal mining	527,025	523,869	1.5	3,156	..
Crude petroleum and natural gas production	183,619	178,522	0.5	5,097	..
Other mines and quarries	202,356	199,670	0.6	2,686	..
Construction	2,056,274	2,022,032	5.9	34,242	0.3
Manufacturing	10,572,842	8,250,590	24.2	2,322,252	20.8
Food and kindred products	1,003,628	894,534	2.6	109,094	1.8
Textile-mill products	1,170,024	692,353	2.0	477,671	4.3
Apparel and other fabricated textile products	780,664	265,324	0.8	515,340	4.6
Logging	141,495	140,233	0.4	1,262	..
Sawmills and planing mills	435,559	427,072	1.3	8,487	0.1
Furniture, store fixtures and miscellaneous wooden goods	361,523	319,056	0.9	42,467	0.4
Paper and allied products	328,241	256,519	0.8	71,722	0.6
Printing, publishing and allied industries	630,677	501,583	1.5	129,094	1.2
Chemicals and allied products	439,845	362,241	1.1	77,604	0.7
Petroleum and coal products	201,180	186,821	0.5	14,359	0.1
Leather and leather products	364,443	225,529	0.7	138,914	1.2
Stone, clay and glass products	336,745	293,521	0.9	43,224	0.4
Iron and steel and their products	1,203,215	1,109,623	3.4	93,592	0.8
Nonferrous metals and their products	279,454	239,370	0.7	40,084	0.4
Machinery	1,072,250	909,039	2.7	163,211	1.5
Automobiles and automobile equipment	574,931	525,010	1.5	49,921	0.4
Transportation equipment, except automobile	305,872	295,866	0.9	10,006	0.1
Other and not specified manufacturing industries	793,096	546,896	1.6	246,200	2.2
Transportation, communication and other public utilities	3,113,353	2,768,267	8.1	345,086	3.1
Railroads (including railroad repair shops) and railway express service	1,135,019	1,099,361	3.2	35,658	0.3
Trucking service	427,623	414,250	1.2	13,373	0.1
Other transportation	615,029	586,404	1.7	28,625	0.3
Communication	393,300	182,703	0.5	210,537	1.9
Utilities	542,382	485,489	1.4	56,893	0.5
Wholesale and retail trade	7,538,768	5,509,228	16.2	2,029,540	18.2
Wholesale trade	1,206,761	1,024,914	3.0	181,847	1.6
Food and dairy products stores, and milk retailing	1,489,303	1,206,548	3.5	282,755	2.5
Eating and drinking places	1,116,202	637,562	1.9	478,640	4.3
Motor vehicles and accessories retailing, and filling stations	739,311	695,499	2.0	43,812	0.4
Other retail trade	2,987,191	1,944,705	5.7	1,042,486	9.4
Finance, insurance and real estate	1,467,597	1,013,297	3.0	454,300	4.1
Business and repair services	864,254	787,377	2.3	76,877	0.7
Automobile storage, rental and repair services	479,592	466,305	1.4	13,287	0.1
Business and repair services, except automobile	384,662	321,072	0.9	63,590	0.6
Personal services	4,009,317	1,133,555	3.3	2,875,762	25.8
Domestic service	2,326,879	266,043	0.8	2,059,936	18.5
Hotels and lodging places	552,055	266,755	0.8	285,000	2.6
Laundering, cleaning and dyeing services	442,803	225,033	0.7	216,870	1.9
Miscellaneous personal services	686,080	373,024	1.1	313,056	2.8
Amusement, recreation and related services	395,342	316,063	0.9	79,279	0.7
Professional and related services	3,317,581	1,472,453	4.3	1,845,128	16.6
Government	1,753,487	1,414,069	4.2	339,418	3.0
Industry not reported	688,836	450,570	1.3	238,266	2.1

for wartime employment would undoubtedly make possible a considerable increase in the size of the working population. Further small additions to the labour force would be available from such categories as "in school," and "other and not reported."

Occupations.—The major groups of occupations in which people engaged in private or nonemergency government employment were working in the week of March 24–30, 1940, are shown in Table IX. Although these figures pertain to the largest group in the labour force (over 85% of the total), the percentage relationships cannot be assumed to apply to the entire labour force, because of the well known fact that the volume of unemployment varies markedly from occupation to occupation.

The distribution of employed persons by major occupation groups differed greatly as between males and females. Nearly one-half of the men were employed in three groups, "Farmers and farm managers," "Craftsmen, foremen and kindred workers," and "Operatives and kindred workers," whereas the proportion of females employed in the same three groups was only slightly more than one-fifth. The leading occupation groups for females—"Clerical, sales and kindred workers," "Operatives and kindred workers," and "Domestic service workers"—accounted for nearly two-thirds of all employed women, a proportion more than twice as great as that for men in the same groups. The widest disparity in representation of the two sexes was shown by the group "Domestic service workers," which included 17.7% of the employed women and 0.4% employed men.

The relationship between residence and occupation is brought out by data in Table IX for the urban, rural-nonfarm and rural-farm areas of the United States. This relationship is particularly apparent in the rural-farm areas, where approximately 7,500,000 out of more than 9,500,000 employed persons were engaged in agricultural pursuits. The remaining 2,000,000 persons represented mainly persons who lived on farms and worked elsewhere, but included as well some proprietors, professional workers, etc., who followed nonfarm pursuits at their farms.

The occupation classification system used in the 1940 census is not completely comparable with the systems used in the 1930 and earlier censuses, though many of the specific classifications (including some of the largest and most important) are the same, or substantially the same. The data presented in Table IX are in terms of 12 major groupings of the 451 specific occupation titles of the 1940 classification system. The 451 items of the complete census list are almost uniformly convertible to a shorter "Convertibility List of Occupations" which was prepared by the Joint Committee on Occupation Classification (sponsored by the Central Statistical board and the American Statistical association) in order to increase convertibility among occupation statistics from various governmental and private sources.

Industries.—The industrial distribution of employed persons shown in Table X reveals marked differences for men and for women. The two most important major categories for men were "Agriculture, forestry and fishing," and "Manufacturing," which together accounted for nearly one-half of the total number employed. The most important industrial groups for females were "Personal services," "Manufacturing" and "Wholesale and retail trade," accounting for nearly two-thirds of all employed women.

The contrast between the industrial distributions of men and of women is brought out even more clearly by subdividing the total number employed into two broad groups, those producing goods and those providing services. More than 56% of all employed men were engaged in the production of goods, including the categories "Agriculture, forestry and fishing," "Mining," "Construction" and "Manufacturing," while the proportion of women in the same categories was less than 26%. On the other hand, the proportion of employed women engaged in some of the industrial categories concerned with the provision of services was much larger than the corresponding proportion for men. The contrast was particularly noteworthy in the case of "Personal services" and "Professional and related services." Over two-fifths of all women were employed in these two groups, whereas the corresponding proportion for men was less than one-twelfth.

The industry classification used in the 1940 census is not fully comparable with that published in earlier censuses. The data presented in Table X are in terms of a list of 45 industry groups, which represent selections and consolidations from a 132-item list designed by an interagency committee to classify industry reports from individuals.

Housing Data.—The census of housing was taken at the same time as the census of population and by the same enumerators. From the housing census were obtained a number of fundamentally important items which have previously been obtained from the population schedule, such as tenure and value or rent of home, and size of family or household. Certain new designations have been made necessary by the added detail called for in this census. A dwelling unit, as the term is here used, is the living quarters occupied by one family or household. In an apartment house there are, therefore, as many dwelling units as there are separate apartments.

Of the 37,336,890 dwelling units reported in the entire U.S., 1,884,016, or 5.0%, were returned as vacant and for sale or rent, while 591,249 were returned as vacant (or at least not occupied by regularly enumerated census families) and not for sale or rent. This last group was made up rather largely of seasonal dwelling units, such as summer homes held for later occupancy by households not living in them at the time of the census.

The percentage of dwelling units vacant and on the market in urban areas was only 4.3, as compared with 6.1 in rural areas. The dwelling units reported include both seasonal and ordinary units, and the larger percentage vacant in rural territory is explained in part by the large number of seasonal units in rural areas.

The number of occupied dwelling units represents approximately the number of private households and may therefore be compared roughly with the number of private families shown in the census reports for 1930. Such a comparison shows that the number of private households increased approximately 16.6%, or more than twice the 7.2% increase shown in the population of the United States between 1930 and 1940. The average population per occupied dwelling unit in 1940 was 3.8 for the United States as a whole, as compared with an average population per family of 4.1 in 1930. More than half of the increase in number of families in the decade is thus due to a decline in family size and less than half to population increase. These figures are summarized in Table XI.

Table XI.—Occupied Dwelling Units or Families, and Population per Unit, 1940 and 1930

Item	Total	Urban	Rural
1940			
Population	131,669,275	74,423,702	57,245,573
Occupied dwelling units	34,861,625	20,600,428	14,261,197
Average population per unit	3.8	3.6	4.0
1930			
Population	122,775,046	68,954,823	53,820,223
Private families	29,904,663	17,372,524	12,532,139
Average population per family	4.1	4.0	4.3

The decline in the average population per family from 4.1 in 1930 to 3.8 in 1940 represents a continuation of the downward trend in family size which is shown by the following averages from earlier censuses: 4.9 in 1890, 4.7 in 1900, 4.5 in 1910 and 4.3 in 1920. The decline in the average size of the family in the United States is due primarily to increased urbanization and the decline in the birth rate. (L. E. T.)

Centennials: *see* CALENDAR, 1942, page xx.

Central America. The region between Mexico and South America, embracing the colony of British Honduras, the republics of Guatemala, El Salvador,

Honduras, Nicaragua and Costa Rica (*qq.v.*) and usually regarded as also including Panama and the Panama Canal Zone (*qq.v.*). These eight political entities have an area of around 222,674 sq.mi. The population, approximately 8,500,000 in 1941, is concentrated chiefly on the highland plateau adjacent to the Pacific, where it is about 65% Indian in Guatemala, predominantly mestizo in the middle republics, and largely white in Costa Rica. Panama includes a large Negro element of West Indian extraction, while the low Caribbean slope and British Honduras are chiefly negroid. In religion, the people are overwhelmingly Roman Catholic. The republics, with the conspicuous exception of Costa Rica, and perhaps of Panama, are virtual dictatorships.

The Central American republics were active protagonists of hemispheric defense during 1941. Vigorous repression of pro-axis agitators was the rule, notably in Costa Rica, a focal point of nazi machinations. Except for a successful coup d'état in Panama, there were no internal disorders. With striking unanimity the six republics responded to the Japanese attack upon the United States in December with declarations of war against all the principal axis powers.

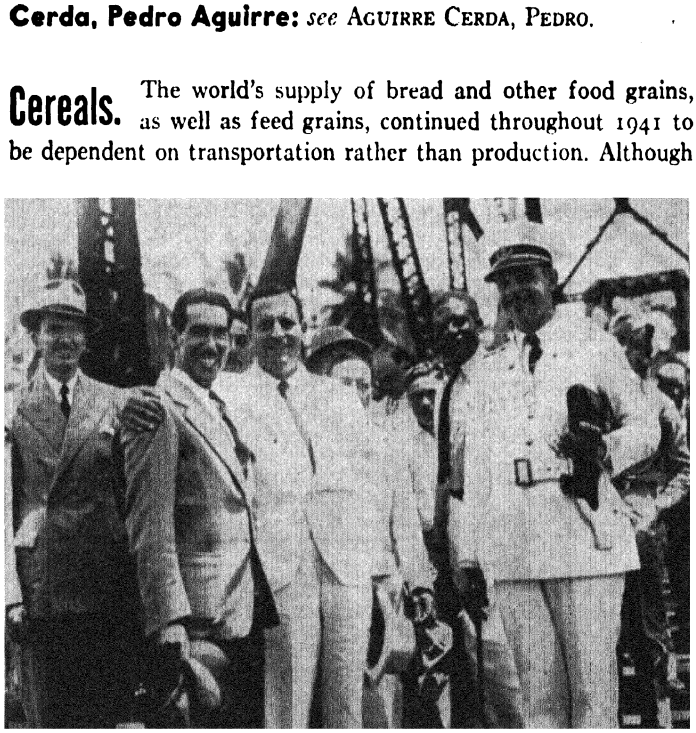
Education.—Education and literacy vary greatly from country to country, with Costa Rica by far the most advanced.

Trade.—In 1940, Central American imports approximated $78,800,000 in value, exports $57,600,000, representing decreases of 10% to 15% from 1939 totals. Foreign trade generally expanded in volume and value during 1941. From 60% to 95% of all 1940 exports went to the United States, which supplied slightly greater percentages of imports. Imports are largely foodstuffs, fuels, textiles, machinery and other manufactured goods. Coffee from the Pacific uplands and bananas from the lowlands are the chief agricultural commodities, with the trend toward greater diversification, however. British Honduras's main exports are logwood, hemp and chicle. Gold mining is of increasing importance, especially in Nicaragua, where gold usually contributes 70% of all export values. Corn and beans for domestic consumption are usually the most important crops from a domestic point of view.

Communication.—External communication is by sea and by Pan American airways, with internal air service by Central American Air transport ("TACA") and domestic lines. Railways and highways provide further but inadequate communication. Construction of the Inter American highway, however, was being pushed at an accelerated rate during 1941. (*See* articles on separate countries and HISPANIC AMERICA AND WORLD WAR II.) (L. W. BE.)

Cerda, Pedro Aguirre: *see* AGUIRRE CERDA, PEDRO.

Cereals. The world's supply of bread and other food grains, as well as feed grains, continued throughout 1941 to be dependent on transportation rather than production. Although severe shortages were prevalent in certain areas, particularly throughout Europe, new production added still further in other areas to huge surpluses which were already amply sufficient for the needs of the entire world. Submarine and mine sinking of grain cargoes and other wartime destruction of grain stocks was apparently inconsequential.



PRESIDENT ARNULFO ARIAS of Panama (second from left) and President Rafael Calderon Guardia of Costa Rica (with arm around Arias) gave a visual demonstration of the good-neighbour policy in April 1941 at the opening of a new international bridge connecting the two countries. Arias, long accused of pro-Fascist sympathies, was forced out of office Oct. 7, 1941 in a bloodless revolution

In Jan. 1942 a Canadian government report quoted the *Southwestern Miller* (United States) to the effect that sinkings of wheat (chiefly cargoes destined for Britain) were estimated at 20,000,000 to 25,000,000 bu.; total deterioration and destruction from war, including the bombing of warehouses, was 40,000,000 to 60,000,000 bu. World production of wheat in the crop year of 1941-42 was estimated by the office of foreign agricultural relations, U.S. department of agriculture, at 6,020,000,000 bu. The 1941-42 crop year included the 1941 harvest in the northern hemisphere and the 1942 harvest in the southern hemisphere. The world wheat crop was 6,030,000,000 bu. in the crop year of 1940-41.

The "Big Four" (United States, Canada, Argentina and Australia) in 1941 added a 670,000,000-bu. exportable surplus to their already large accumulations. The 1941 crop of grains in Europe, although below normal because of bad weather, was reported to have afforded some easing of bread rationing and adulteration of wheat flour with barley, rye and potato flour. The U.S.S.R. was reported to have added extensively to the fall (1941) planting of winter wheat and rye in western Siberia, to replace the loss of the Ukraine. Autumn planting of grain in German-held parts of the U.S.S.R. in 1941 was reported not very successful. Reserve supplies of grain in the United Kingdom were reported at 50% more than before the war, but the proportions of bread and feed grains in these stocks were not disclosed. Normal disappearance of wheat in the United Kingdom is about 260,000,000 bu. per year. At the beginning of the year the British government offered $8 per ac. for grassland plowed up and sowed to grain or other food crops. In France, where bread rationing was 8 oz. per person per day (a slim ration for the French), the government appropriated $120,000,000 to pay the difference between the price of bread and the price of wheat. The fixed price of wheat was $1.58 per bushel. The 1941 wheat acreage in Europe was placed at 408,000,000 ac.; the crop at 74,800,000 bu. The 1940 acreage was 406,400,000 ac. and the crop was 72,600,000 bu. These estimates were unofficial, since very few European countries permitted figures to be published in 1941. A short crop in 1941 in Turkey prevented any export of grain from that country and caused the establishment of a bread ration of 1½ lb. per person per day for labourers. The ration was less for sedentary workers. Shipments of wheat by Britain relieved a shortage in Syria and permitted the suspension of bread rationing in Palestine. Cold weather injured the wheat crop in Spain and Italy and reserves were dwindling rapidly.

With the outbreak of war between the United States and Japan, the price of feed grains in the United States advanced sharply, as they did when the United States entered World War I. Feed supplies, however, were much larger than they were in 1917. The government established a feed control unit in 1941 to prevent an excessive advance in feed prices. World supply of rice was abundant in 1941, with unsalable surpluses in Burma and other exporting countries and with a number of American countries entirely or partly self-sufficient and no longer dependent on the Orient for rice. Production was increasing particularly in Peru, Ecuador and Guatemala. (*See* BARLEY, CORN, OATS, RICE, RYE, WHEAT; *see* also FARM INCOME for U.S. lend-lease exports to Great Britain.) (S. O. R.)

Ceylon. A British crown colony, lying off the southern extremity of India and approaching within 6° of the equator. Area 25,332 sq.mi.; pop. (est. Dec. 31, 1939) 5,992,000. Chief towns (pop. census 1931): Colombo (cap., 284,155); Jaffna (45,708); Galle (34,424); Kandy (37,147). Governor, Sir Andrew Caldecott, K.C.M.G.; languages, English, Sinhalese, Tamil; religions, Buddhism and Hinduism the chief.

History.—Prior to the outbreak of war, Ceylon had—like its big brother India—been in the throes of political agitation. In essence the demand came from the intelligentsia, and was for self-determination and home-rule; but in Ceylon it was linked with dislike of the form of constitution, by which the administration is in the hands of a number of departmental committees. These committees, in the words of Sir Andrew Caldecott, the governor, had developed "no party program, policies or loyalties," and a movement toward cabinet government seemed inevitable. In Oct. 1941, however, the British government, while regarding reform as urgent, decided that further enquiry by commission or conference was essential, but could not be undertaken during the war. Meanwhile, a minor problem relating to the status of Indians in Ceylon had been amicably settled in September, by a provisional agreement which covered both residents and future immigration.

The colony's budget for 1941–42 showed a deficit of 2 crores of rupees ($7,000,000), largely by reason of defense measures. To meet it, the prosperous industries of tea and rubber were

subjected to special taxation on their exports—1½ cents per lb. on the former and 2½ cents on the latter—and an excess profits duty of 50% was imposed on all business concerns. The island's war effort included the equipping of a squadron for the R.A.F.

(ME.)

Education.—In 1939: schools, 6,100, including 336 English schools, 74 bilingual, 3,723 Sinhalese and Tamil (820 estate and 780 unaided); scholars: boys 502,917, girls 325,173.

Banking and Finance.—Revenue (1938–39) Rs. 117,426,650; (est. 1939–40) Rs. 123,484,600; expenditure (1938–39) Rs. 120,502,590; (est. 1939–40) Rs. 129,504,965; public debt (Sept. 30, 1939) £12,258,775 and Rs. 40,270,000; currency Rs. 1 = 100 cents = 1s.6d. in 1941.

Trade and Communication.—Overseas trade, merchandise, 1940: imports Rs. 282,595,229; exports (domestic) Rs. 358,958,405; re-exports Rs. 25,979,201. Communications and transport 1938: roads, main surfaced 4,485 mi.; railways (117 mi. narrow gauge), total 960 mi.; shipping, entered 1938, 13,228,439 net tons; motor vehicles licensed (Dec. 31, 1939), 21,014 motor cars and taxis; 4,408 trucks and vans; 2,574 omnibuses; 2,906 cycles; 52 tractors; 210 trailers; wireless receiving set licences (Dec. 31, 1937), 4,911; telephone instruments in use (1938), 10,424.

Agriculture.—Production, in metric tons: rice (1938–39) 300,000; copra (including coco-nut oil) (1939) 155,000; tea (1939) exports 103,400; rubber (1939) shipments 62,000.

Chaffee, Adna Romanza (1884–1941), U.S. army officer, was born Sept. 23 at Junction City, Kan., the son of a former chief of staff of the U.S. army. He was graduated from West Point in 1906, the Fort Riley cavalry school in 1908 and the Saumur cavalry school in France in 1912. During World War I, young Chaffee, then a major, was sent to France, where he attended the general staff college in Langres. He saw action in both the St. Mihiel and Meuse-Argonne offensives in 1918 and won the D.S.M. In 1930 Chaffee anticipated the advent of an army moving on wheels which would revolutionize methods of warfare, and urged the war department to equip the U.S. army with tanks and tractor-borne trucks. At first Chaffee was considered a visionary; later his theories of mechanized armies were put into practice. In 1938 Chaffee was named to command the mechanized 7th cavalry brigade, the only mechanized unit in the army, and was promoted to brigadier general. Prior to his death he was appointed major general and was awarded the oak leaf cluster. He died in Boston, Aug. 22.

Chain Stores: *see* BUSINESS REVIEW.

Chambers of Commerce. National defense requirements were given ever-increasing consideration by business and industry in the United States during 1941. Tremendous increases were shown in industrial production for defense purposes and business institutions of all kinds sought to adjust themselves to the numerous and complicated requirements of the defense program. Upon the entrance of the United States into World War II on Dec. 8, 1941, organized business immediately enlisted for the duration. Chambers of commerce and trade associations at once changed to a war basis, with war activities given preference over all others.

The Chamber of Commerce of the United States, which is a federation comprising 1,689 chambers of commerce and trade and industrial associations, with membership of approximately 1,000,000 business men, continued to interpret the economic and social aspects of the national defense program, and to give its full support to defense measures.

With the declaration of war by the U.S., the national chamber correlated the activities of its nation-wide member organizations to effect victory. (A. W. H.)

Channel Islands: *see* BRITISH EMPIRE.

Cheese. United States cheese production in 1941 substantially exceeded 900,000,000 lb. for the first time. The increase was a direct result of the government lend-lease program to expand the output of cheese because this product is a highly important part of the established diet in Great Britain.

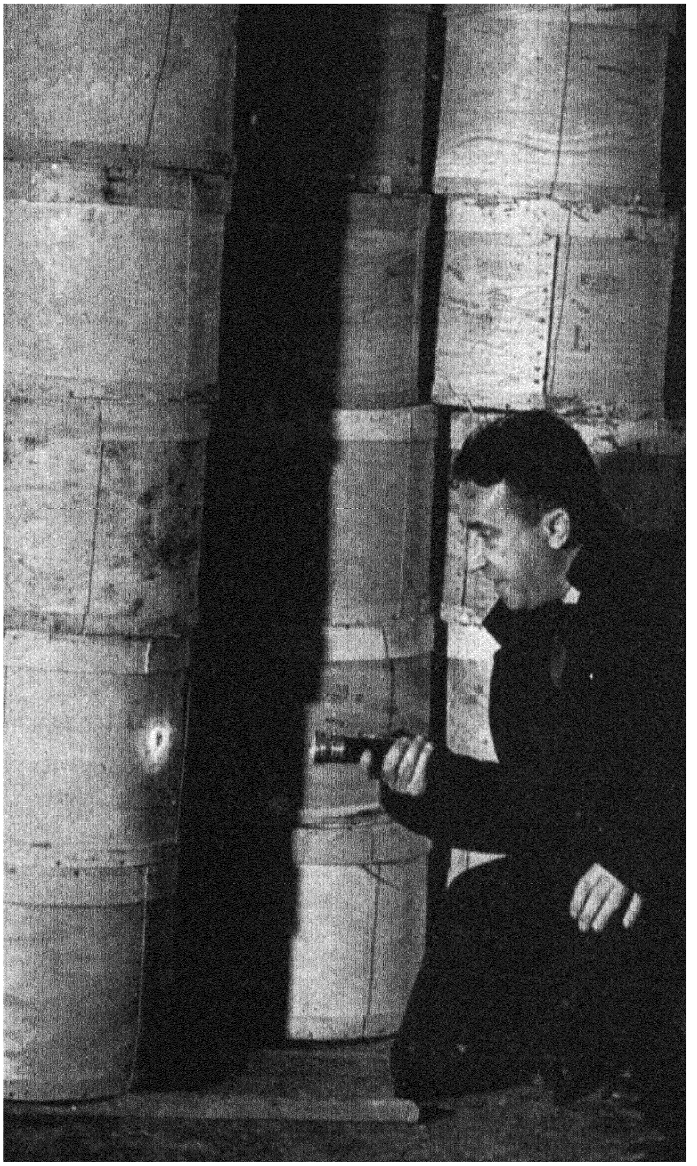
In every month of 1941 production increased by amounts ranging from 4,000,000 to almost 20,000,000 lb. For the first 11 months the output was 847,250,000 lb., compared with 733,469,000 lb. in the same period of 1940. American cheddar cheese accounted for 670,605,000 lb. of the 11 months' output in 1941. A number of creameries and condenseries manufactured cheese for the first time. The government's lend-lease program called for still further increase in cheese production in 1942, possibly by as much as 33%, and governmental aid to assist in plant expansion was announced.

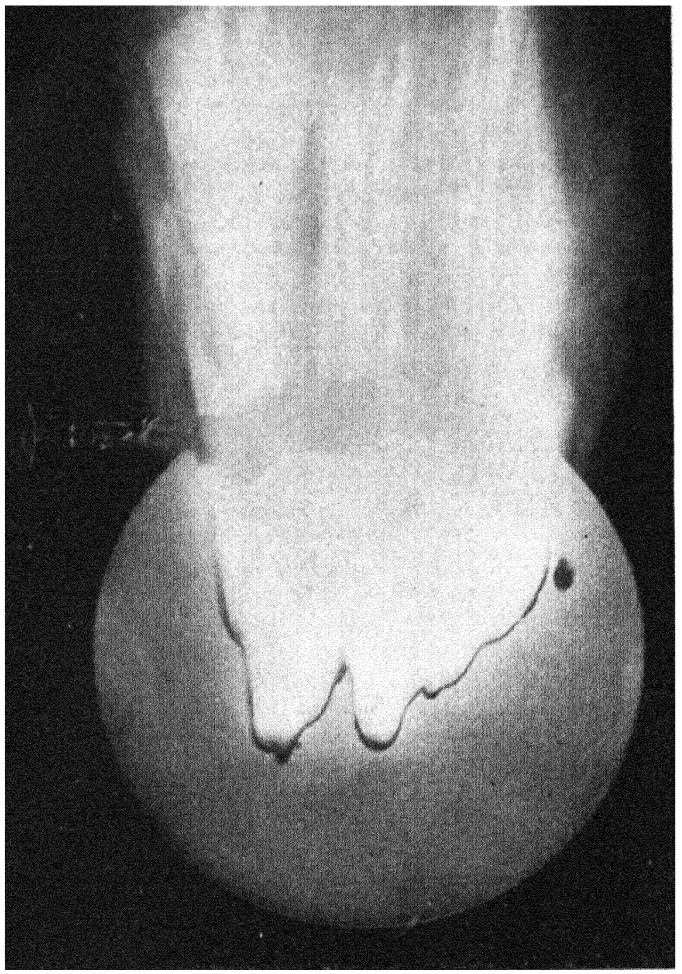
The department of agriculture began its expanded program of purchase of food for Britain March 15, 1941, and from that date to Dec. 1, 1941, bought 137,566,710 lb. of cheese at a f.o.b. cost of $31,544,071 to ship to the United Kingdom. Storage stocks of cheese, largely held by the government for export, were 188,225,000 lb. Dec. 1, 1941, compared with 137,389,000 on the same date in 1940 and a five-year (1936–40) average of 120,212,000 lb. on that date. While the great majority of such governmental purchases were intended for transfer to other countries under lend-lease provisions, a part of the supplies were available for Red Cross, relief and school-lunch purposes.

In Canada, production of cheese in the first 11 months of 1941 was 141,118,934 lb., an increase of 0.6% over the corresponding period of 1940. The Canadian government adopted control measures over the shipment and storage of cheese. In Australia and New Zealand, governmental measures were advanced to increase the production of cheese and other dairy products. As a result of these several governmental activities, the British supply of cheese was increased, and by order of the food ministry Oct. 29, 1941, establishments could serve cheese as a subsidiary dish without restrictions. (*See* also DAIRYING; MILK.) (S. O. R.)

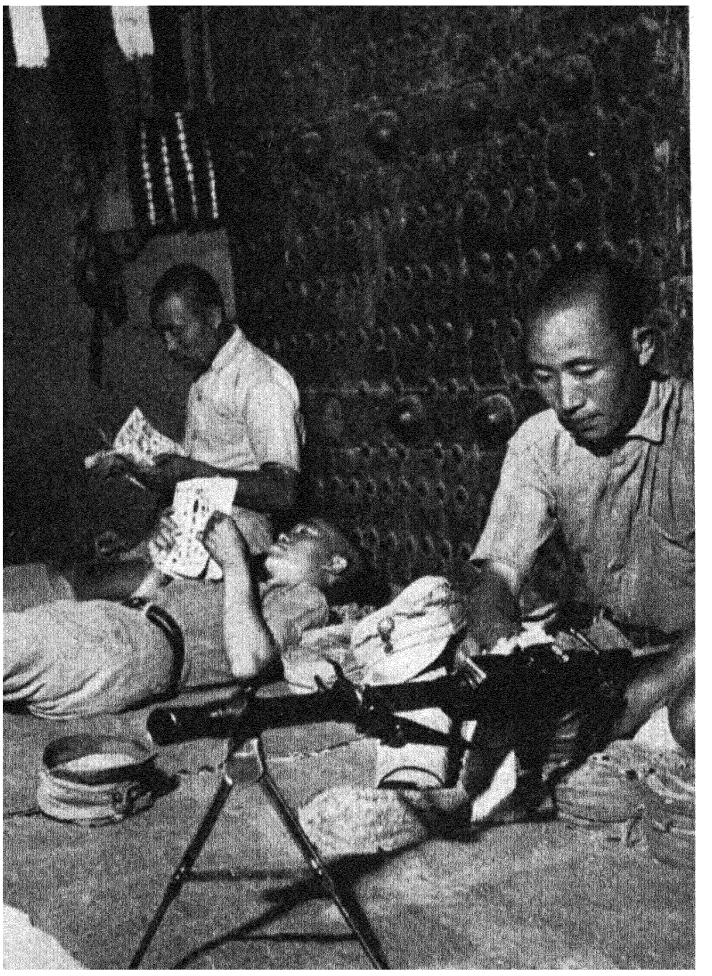
Chemical Therapy: *see* MEDICINE.

CASES OF CHEDDAR CHEESE being inspected by an official of the U.S. department of agriculture in 1941 before shipment to Great Britain under terms of the lend-lease act





THE OPERATION OF BRITAIN'S "FIRE CARDS" dropped on German grain fields and forests in 1940 was demonstrated in 1941 at Columbia university. The disc of absorbent paper, impregnated with phosphorus and moistened in water, bursts into flame as soon as the water evaporates

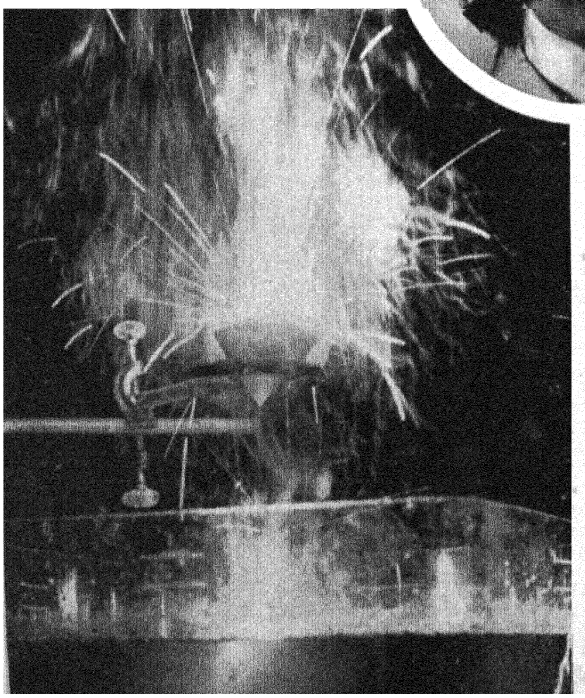


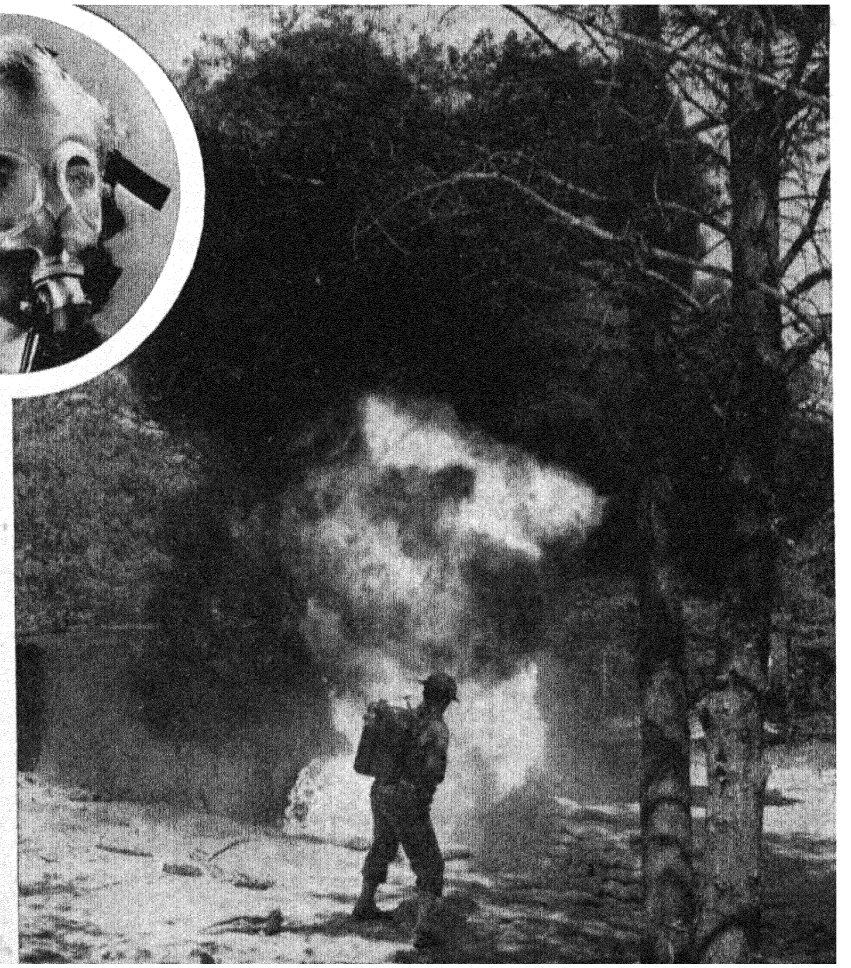
CHINESE ANTI-GAS CHAMBER on the Yellow river front

THE U.S. ARMY'S portable flame thrower was first demonstrated in 1941 at Ft. Belvoir, Virginia

(Right) TRANSPARENT PLASTIC gas mask exhibited in 1941 at New York city

LABORATORY DEMONSTRATION conducted in 1941 at Columbia university, New York city, to show how thermite incendiary bombs burn under water





Chemical Warfare. The situation with respect to chemical warfare during the second year of World War II was exactly similar to that prevailing throughout the first year in its two main aspects. In the first place, no single instance of the actual use of toxic chemicals of any kind by any of the combatant powers against either troops or civilians was substantiated. In the second place, however, unconfirmed reports were circulated assiduously at frequent intervals that such use was contemplated in the immediate future. These reports varied in their specific details. Sometimes the assertion was made that a poison gas attack had definitely been delivered at some remote section in the far-flung battle front; sometimes it was stated that detailed instructions for the employment of poison gas on a large scale had been discovered in a captured army headquarters; sometimes it was disclosed that enormous stocks of toxic chemicals, ready for use, had been accumulated at critical frontier points.

While all such rumours were primarily, it was obvious, circulated for propaganda purposes, it was certain that they sufficed to maintain tense expectation of possible developments in chemical warfare throughout the year.

In one respect, the axis powers held a very real advantage in the matter of the potential threat of chemical warfare. They could be confident that the allies would respect their renunciation in the Geneva gas protocol of 1925 (a protocol signed and ratified by 39 members of the League of Nations) of "the use in war of asphyxiating, poisonous and other gases and all analogous liquids, materials and devices" to the length that they would never be the first to reintroduce chemical warfare and would employ it only in retaliation. On the other hand, Germany undoubtedly has built up considerable reserves of chemicals suitable only for poison gas purposes and, it was generally believed in 1941, outside the axis powers, that Germany undoubtedly would not scruple to employ such chemicals against its opponents in the field or against civilians whenever it suited its ends to do so.

Nazi Germany, consequently, could compel the Allies to divert a vast amount of war energy, both man power and material, which could otherwise be put to services of greater urgency, into the task of building up an elaborate and comprehensive gas defense organization. The entire population of Great Britain had been supplied with gas masks and educated in the measures to be taken if a gas attack was made; if such an attack is never made the whole of this labour will have been an unnecessary drag upon the national war effort.

The nazis themselves, meanwhile, have been at liberty to take the problems of chemical defense more lightly, knowing that their civilians, although not provided with the same protection, were in no immediate danger.

It is most important to note, however, that Germany retained the advantage just described only so long as its leaders refrained from initiating chemical warfare; the day that chemical warfare is started the pendulum swings over to the other side. For Great Britain would certainly not hesitate in this war, as it did hesitate in World War I, to retaliate, and Germany could not count in 1941, as it could in 1915, upon a six-months' start. Its own troops and its own population would be at once exposed to the same perils.

It was therefore legitimate to draw the conclusion that, in all probability, the reintroduction of chemical warfare would be deferred by Hitler (who was himself a British mustard gas casualty in 1918) until the very latest moment, when it would constitute a last desperate gamble for victory. Allied scientists, knowing how far progress in gas defense has outstripped progress in gas attack since 1918, were confident in 1941 that this last desperate gamble would fail. (J. KL.)

Chemistry. Curtailment in chemical activity throughout the world is reflected in the number of abstracts (about 52,000) for 1941 compared with those (about 58,000) for 1940. Selected topics from these articles are presented below to show significant trends in chemistry during 1941.

Detection of Traces of Water.—Frequently it is a matter of importance to be able to analyze for traces of water, such as the percentage of water in alcohol or acetone or acetic acid. A versatile reagent for this purpose was discovered in 1935 by Karl Fischer.

Since 1939 it has been developed extensively by D. M. Smith, Bryant and Mitchell of the du Pont company.

The Karl Fischer reagent is a brown-coloured solution of iodine, sulphur dioxide and pyridine in methanol. Traces of water in a solution to which it is added drop by drop discharge the brown colour, hence its colour serves as an indicator to detect the end point of the titration. This reaction occurs: $SO_2 + I_2 + 3\ C_5H_5N + H_2O \rightarrow 2C_5H_5NHI + C_5H_5NSO_3$ (which reacts further with methanol to produce $C_5H_5NHOSO_2OCH_3$).

Smith found that the reagent may analyze for the water in a variety of substances such as alcohols, esters, acids, hydrocarbons, and the like. Aldehydes and ketones cannot be tested directly, however, because the methanol in the reagent interferes. This interference can be offset if the cyanhydrin of the aldehyde or ketone is prepared first by addition of hydrogen cyanide and the water titrated thereafter in the usual way.

Development of this work revealed that the Karl Fischer reagent could be used not only to determine water as an impurity in alcohols but also to analyze alcohols themselves. The basis of this procedure is to add an excess of acetic acid (containing boron trifluoride as catalyst) to produce water and the acetic ester quantitatively. The quantity of water formed is an index of the alcohol taken and is determined by the reagent. In identical fashion, organic acids may be analyzed by esterifying with an excess of methanol (containing BF_3) after which the water produced is analyzed as before. A method for analyzing acid anhydrides was also developed. In this method a slight excess of water is added to change the acid anhydride into the acid, then the excess of water is titrated. The water consumed in the first operation indicates the quantity of original acid anhydride. Other interesting applications of this useful Karl Fischer reagent were reported.

Organic Components of Corals.—In 1846 Silliman, in his classical study on the composition of corals, pointed out that in spite of their inorganic appearance, the stony- or reef-corals contain 4% to 8% of organic matter. He also observed that part of this organic matter was a wax which could be separated from its inorganic surroundings by boiling with water.

Nearly a century passed without further characterization of this organic material. Lester and Bergmann of Yale university confirmed Silliman's observation and found that this wax occurs to the extent of 0·25% to 0·5%, and identified it as cetyl palmitate.

This wax, known as spermaceti, is the same as that obtained from the sperm oil contained in the head cavity of the sperm whale.

Industrial Production of Nitroparaffins.—Nitroparaffins such as nitromethane or nitropropane have been known for many years but until recently they have been curiosities, hard to prepare and with no uses. A few years ago laboratory experiments at Purdue university showed that these substances could be made by direct nitration of the hydrocarbons in natural gas, if performed at elevated temperatures in the vapour phase. Production of nitroparaffins industrially was started during 1941 by the Commercial Solvents corporation in their plant at Peoria, Ill. In

view of the cheapness and availability of natural gas as a raw material, and in view of the remarkable properties of the nitroparaffins, this development represents an important milestone in industrial chemistry. Nitromethane, CH_3NO_2, is a liquid whose boiling point is about the same as water. Many uses for it as a solvent have been reported already. The condensation of nitromethane with aldehydes in the presence of alkalis yields nitro alcohols.

Formaldehyde, for example, yields trishydroxymethylnitromethane $(HOCH_2)_3CNO_2$. The trinitrate of this alcohol is valuable as an explosive.

The properties of the esters of these nitro alcohols were reported in 1941 by Tindall.

Nitroparaffins, although insoluble in water, dissolve readily in alkali. When chlorine is passed into such a solution, chloronitroparaffins are formed immediately. Trichloronitromethane is the well known chloropicrin.

Another reaction of nitroparaffins is their behaviour towards mineral acids; 1-Nitropropane, for example, when treated with sulphuric acid changes into propionic acid and hydroxylammonium sulphate. This provides a cheap source of hydroxylamine for the first time, as well as an independent source of propionic acid.

Hydrogenation of the nitro group in the nitroparaffins has proved to be an excellent method of obtaining amines. The nitroalcohols, similarly treated, yield amino alcohols. This brief survey of the reactions of nitroparaffins takes up but a few of the many applications which have been announced.

Chemical Substances in Cork.—Drake and collaborators at Maryland have done much to extend knowledge of the composition of cork. Sitosterol has been identified definitely. Phellonic acid, another ingredient, has been shown to be 22-hydroxytetracosanoic acid; *i.e.*, a 24-membered straight chain hydroxy acid wherein the hydroxy group is on the 22nd carbon from the terminal acid carbon. Paraffin hydrocarbons, $C_{21}H_{44}$ to $C_{31}H_{64}$, have been characterized also. Most of Drake's work, however, has dealt with the elucidation of the structure of friedelin, a cork substance isolated many years ago and named in honour of the famous French chemist Friedel. His work proves that friedelin, $C_{30}H_{50}O$, is a pentacyclic unsaturated ketone. Twenty-two of the 30 carbons make up the five rings. These are thought to be staggered in the manner of phenanthrene or picene since, on drastic dehydrogenation with selenium dioxide, 1,2,8-trimethylphenanthrene and 1,8-dimethylpicene were obtained.

Maleic Anhydride from Turpentine.—Phthalic acid is inexpensive because it is prepared so readily from naphthalene by oxidation with air over a hot vanadium pentoxide catalyst. Maleic acid is prepared in the same way from benzene. The yield, while good enough to make maleic acid an industrial chemical, does not compare with the excellent yield of phthalic acid from naphthalene.

In a search for another way to prepare maleic acid economically, Clark and Hawkins of Florida studied the oxidation of alpha-pinene, which is the major ingredient in American turpentine. They found that about the same yields, namely, 25–30% of maleic acid could be realized from alpha-pinene as from benzene. The experimental conditions consisted in passing a mixture of pinene vapour and air at 425°C. over a vanadium pentoxide catalyst. Formaldehyde and carbon dioxide were formed also.

Zeolites and Ion Exchangers.—Certain materials in the soil are called zeolites. These are related to clay and include such substances as the glauconites, bentonitic clays, or hydrated aluminum double silicates. In the soil these compounds may occur as calcium salts. Such zeolites tend to bind potassium or ammonium ions when potassium or ammonium salts are placed upon a soil. One may visualize what occurs by letting CaZ represent a calcium zeolite, whereupon reaction with potassium chloride ($2KCl$) produces potassium zeolite (K_2Z) and calcium chloride ($CaCl_2$). The calcium chloride washes off in rain water, and the valuable potassium ion is held by the insoluble zeolite.

Artificial zeolites, known as permutites, are made by melting kaolin (aluminum silicate) with quartz and soda. Their chief use has been to soften hard water. The mode of action is to replace the calcium in hard water by sodium. To do this, hard water is passed through a tank of sodium zeolite (Na_2Z). The water leaving the tank is soft. At intervals a brine solution (sodium chloride) is passed through the tank to regenerate the sodium zeolite and rinse out the undesirable calcium. The reversibility of the process and the insolubility of the parent substance is what makes it valuable.

This type of base exchange has been known for nearly a century, and its application to water purification has been practised for decades. In spite of this, intensive research on the general problem has been carried on only since 1935, following the discovery of Adams and Holmes that certain synthetic resins possessed ion-exchange properties.

The new zeolites are referred to as carbonaceous zeolites and resinous zeolites. A disadvantage of the natural zeolites was their instability toward acid solutions. Both of the newer types are stable in acid solutions.

Carbonaceous zeolites are obtained by treating coal or lignite with strong reagents such as fuming sulphuric acid, or chlorosulphonic acid. Broderick and Bogard of the U.S. bureau of mines reported that good carbonaceous zeolites could be made from Alabama bituminous coal by treatment with sulphur trioxide at 150°C. It may be assumed that there is sulphonation of hydrocarbon positions in the coal skeleton (*i.e.*, $\equiv CH$ changes to $\equiv CSO_3H$). Since these carbonaceous zeolites are sulphonates, they may function either as hydrogen zeolite or sodium zeolite. Regeneration of the hydrogen zeolites may be accomplished by treating the sodium zeolite with acid. Hydrogen zeolites, then, may remove metallic cations from solution and add only hydrogen ions into the solution in exchange. Beaton and Furnas of Yale university applied this method to concentrate extremely dilute copper sulphate solutions. Under idealized conditions, in a zeolite system concentrating dilute copper sulphate (1 g. in 2000 g. of water), one pound of sulphuric acid brought about an increase in concentration equivalent to the evaporation of over two tons of water. This method should have broad applications to recovery problems.

Resinous zeolites are of two types: (1) a phenol-formaldehyde resin into which sulphonic acid groups are incorporated; (2) condensation products of aniline or aromatic amines with aldehydes, into which strong basic groups are introduced, such as quaternary ammonium hydroxides. The first of these is a cation exchanger which functions much like the carbonaceous zeolites. The second is an anion exchanger. It is obvious that if a salt-containing solution is passed through both types of resinous zeolite in turn, all dissolved salts will be removed from the water. Myers and Eastes of Resinous Products and Chemical company reported on favourable tests in water purification by this type of approach. The development was finding new uses in cases where very dilute solutions were involved.

Zein.—Zein was the name given in 1821 to the alcohol-soluble protein of corn by its discoverer, Gorham. Its interest at the present time owes to the fact that it is new industrially. Swallen of Corn Products Refining company was active in this development.

Zein is isolated commercially from gluten meal which, on a dry basis, is about half protein. It is extracted for two hours with warm isopropyl alcohol containing 15% of water. After filtration, the extract is mixed with hexane. Two layers form, most of the zein remaining in the lower layer, from which it is precipitated by

dilution with water.

Zein reacts with formaldehyde to form a tough plastic, but it reacts more slowly than other proteins such as casein. This is an advantage since the formaldehyde may be mixed directly with the zein and other ingredients before baking at 100°C. to effect the curing reaction. The plastic may be machined and dyed from aqueous dye baths. Another outstanding use for zein appears to be as a decorative coating for labels or magazine covers where a pleasing surface is desired.

Distillation of Sugars.—When sugars are heated they undergo caramelization and charring. Distillation in the customary sense is impossible. This is one of the reasons why experimentation with carbohydrates is difficult. Syrups which resist crystallization have been particularly troublesome to characterize, and these include malt syrup, honey, corn syrup, "hydrol" and others.

Carbohydrate mixtures may be separated by converting them to methyl ethers which are distillable. The unfortunate part of this operation, however, is that with disaccharides (sucrose, maltose, lactose) or trisaccharides (raffinose, melezitose) there is no way to regenerate the sugars from the ethers without destroying the sugar itself.

This difficulty was solved by Hurd, Gordon and Liggett of Northwestern university. They convert the sugars to propionic esters by the action of propionic anhydride and pyridine. Such propionates were found to be distillable, even from the trisaccharides, at temperatures between 160 and 300°C. if the pressure was lower than 0.001 mm. of mercury. In this way, propionates of mono-, di- and trisaccharides could be collected in separate fractions. Mild alkaline treatment was found to remove the propionate groups and bring about regeneration of the sugar itself. Identification of the sugar in this purified state would follow the customary procedures. The fact that many of the sugar propionates were crystalline solids was helpful also in characterization.

Wing Pigments of Butterflies.—Work in this field has been in progress for several years and the problem was in 1941 unsettled. The chief investigators have been the German chemists Wieland and Schoepf. The wings of butterflies are extracted with ether to remove oily material, then the pigment is dissolved out with dilute ammonium hydroxide. A kilogram of wings gives about 35 g. of crude pigment or 14 g. of purified material.

The term pterin is defined as the coloured or colourless pigment occurring in the form of fine particles beneath the chitin of insects. In chemical composition pterins are very closely related to the purines. Their purification has been very difficult, and no simple means of characterization has been at hand, because of lack of melting points. Since 1930 at least four different empirical formulas have been put forward for leucopterin, the colourless pigment of white butterflies, namely $C_{10}H_{10}O_6N_8$, $C_{19}H_{19}O_{11}N_{15}$, $C_{19}H_{17}O_{11}N_{15}$ and $C_{18}H_{15}O_9N_{15}$. The last was proposed by Wieland in 1941. Coloured pigments such as xanthopterin and chrysopterin are similar but have less oxygen content. That xanthopterin may be oxidized to leucopterin by peroxides was demonstrated by Wieland, who also reported a 90% yield of leucopterin by heating a mixture of 2,4,5-triamino-6-hydroxypyrimidine and oxalic acid for one hour at 260°C.

Crystallization of Glycerol.—As most persons know glycerol, it is a thick, colourless liquid that resists solidification, in spite of the fact that crystalline glycerol is known to melt at 18°C. Hass and Patterson discovered that glycerol may be crystallized conveniently if, instead of chilling it to very low temperatures, it is dissolved in a solvent such as butyl alcohol and kept at ice temperature. It is desirable to add a "seed" of crystalline glycerol to help initiate the crystallization process. Glycerol seed crystals were obtained from pure liquid glycerol by leaving it a few hours at -80°C., the temperature obtained in a Dewar flask with a mixture of dry-ice and acetone.

This process makes it possible to purify glycerol in cases where distillation methods fail. One such instance is the glycerol formed by hydrogenolysis of carbohydrates, which is contaminated by glycerol-like substances with boiling points close to that of glycerol itself. These impurities remain in the solvent in the crystallization process.

An Abnormal Wurtz Reaction.—The reaction between sodium and alkyl halides, discovered decades ago by Wurtz, is a general method for the preparation of paraffin hydrocarbons. In such a reaction, ethyl bromide yields butane, butyl chloride produces octane, and so forth. Much of the knowledge of this reaction has been with comparatively simple alkyl halides.

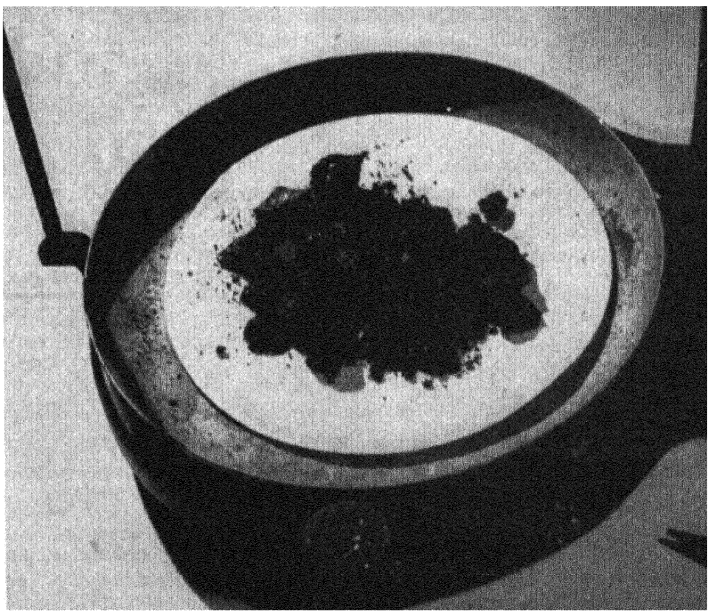
Neopentyl chloride $(CH_3)_3CCH_2Cl$, being an alkyl halide, should undergo this reaction, but the unavailability of such highly branched compounds explains why no such study has hitherto been attempted. Most of the knowledge concerning the chemistry of compounds of this type has been reported within the last decade by F. C. Whitmore of Pennsylvania State college. His results have shown that the so-called general reactions of aliphatic compounds frequently encounter abnormalities when applied to neopentyl systems.

Whitmore and collaborators subjected neopentyl chloride to the Wurtz reaction. Its empirical formula is $C_5H_{11}Cl$. Instead of giving rise smoothly to an isomer of decane ($C_{10}H_{22}$) the yields of it ranged only from 1% to 13%. The major products of the reaction were neopentane and 1,1-dimethylcyclopropane. To produce the 3-membered cyclopropane ring in this reaction was most unexpected and it furnishes another instance of the remarkable effect of structure in limiting general organic reactions.

Non-sulphur Analogues of Vitamin B_1.—The synthesis of Vitamin B_1, or thiamin chloride, was one of the significant accomplishments of 1938. This compound was shown to consist of two units, one a pyrimidine unit and the other a thiazole unit, actually 5-hydroxyethyl-4-methylthiazole.

Thiazole itself is a heterocyclic compound, C_3H_3NS, with the three carbons, the nitrogen and the sulphur making up a 5-membered ring. Each hydrogen is attached in turn to a carbon atom. Pyridine, another heterocyclic compound, is C_5H_5N. In many ways thiazole is known to be like pyridine. Both boil at 115–117°C. The compounds smell alike and both are weak bases.

SYNTHETIC COKING COAL, produced from vegetables subjected to intense heat and pressure, was exhibited in 1941 by Dr. Ernst Berl of the Carnegie Institute of Technology in Pittsburgh



It occurred to Elderfield of Columbia university that it would be interesting to synthesize the pyridine analogue of thiamin chloride to see whether it possessed curative properties toward polyneuritic animals. This involved the synthesis of 3-hydroxyethyl-2-methylpyridine. The starting materials in this synthesis were acetoacetic ester, ethylene glycol, ammonia, and malonic ester. The synthesis was accomplished successfully but no word was received up to the close of 1941 regarding its physiological behaviour. It would be surprising if it possessed thiamin activity, however, in view of the specificity of the structures of most compounds of biological interest. (*See* also INDUSTRIAL RESEARCH; VITAMINS.)

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Chemistry and Engineering, Agricultural, U. S. Bureau of.

War in Europe and the approach of war to the United States had a profound effect on the research work of the bureau of agricultural chemistry and engineering during the fiscal year 1941. Because of the trend of events and the added importance of chemical and engineering research to a nation at war, Dr. Henry G. Knight, chief of the bureau, appointed a defense planning committee as early as Aug. 1939, after which there was directed effort toward making all research projects of particular use in the emergency.

As a result of early preparation, much of the bureau's work was already of such a nature as to be readily brought into line to obtain new information in demand as a result of trade disruptions and new needs. The bureau had in 1941 a co-ordinator of defense activities and a group of advisers ready on call for technical consultation with governmental agencies and other organizations.

The bureau stressed research on the industrial utilization of farm products and on the possibilities of such utilization for the manufacture of materials of military importance or things that had taken on added importance because of shipping difficulties. Other broad fields that received attention from the bureau were food conservation and preservation, development of camouflage materials, nutritional and pharmaceutical replacements and supplements, chemical and technological service on foods shipped under the lend-lease plan, and agricultural machinery and equipment for producing, processing, shipping and storing of crops.

In his report covering the fiscal year, ending June 30, 1941, Dr. Knight showed that the four new regional research laboratories, at Philadelphia, Pa., Peoria, Ill., New Orleans, La., and Albany, Calif., were actively engaged on many research projects although the buildings were ready for partial occupancy less than a year before. Projects under investigation in these laboratories included, as examples: Studies of starting materials for use in the manufacture of rubber substitutes; modifications of various oils as replacements for scarce ones; economical collection of farm residues (straws, stalks, hulls) for manufacture into various products including plastics and rubber intermediates; utilization of cornstarch and dextrose; storage effects on corn; new corn-sugar fermentation processes; new motor fuel sources; materials for blackouts; nitration of lint cotton for use in place of cotton linters for high explosives; use of baled cotton to stop bullets; protection of sandbags against rotting; processing sweet potatoes for starch to take the place of imported tropical root starches; and preservation of foods, particularly fruits and vegetables, for use in wartime.

Other bureau laboratories, long established, brought out results during the year which promised usefulness in industry, on the farm and in the household. Some of the results having to do, directly or indirectly, with meeting urgent problems of the nation at war are given briefly below.

Dehydration of vegetables was improved from the standpoint of colour, flavour, vitamin retention and time required for rehydration for cooking. Substitutes were developed for some products hard to get because of war. Examples of such findings were wax and aconitic acid from the cane sugar industry. Compressing of flour to two-thirds of original volume for overseas and military shipment was found to decrease the loaf volume about 15%, without affecting palatability. Serviceability test and rot-proofing treatment were developed for sandbags used for military purposes.

Tests showed that the protein of stored grains and soybeans kept better when these products were unground. A process was developed for making satisfactory crystallized sugar in quantity from sorgo cane. New information was obtained on quick freezing of poultry, on uses of egg albumen and on the proteins that might be obtained from feathers. Inspection, testing and specification services were provided on food and various products for the army and navy. Results of tests showed that immature wheat stored better and its flour baked better after treatment of the grain with ethylene gas. Processing of cucumbers was improved, the results opening possibilities for the better fermentative preservation of other vegetables.

Agricultural engineering studies brought useful results regarding farm buildings and heating equipment, improvement in machinery for the farm and processing plants, and paying uses for electricity on the farm. Specific examples are: Wind-pressure ventilation was found to have advantages in the storing of grain. A so-called "shell-cooled" improved potato storage was developed. As house insulation, cotton-seed hulls reduced fuel consumption. Studies cleared up some house heating and cooling difficulties. Discoveries regarding dusting nozzles and mixing and spreading properties of insecticides, fungicides and diluents promised more efficient and economical control of crop pests.

Additional developments of interest to farmers included better plow points, discovery that disks bevelled on the inside of the cutting edge pulled much easier than those bevelled on the outside, labour saving of 32% by preparing the seedbed for corn with a subsoil lister attachment instead of a plow, a new sugar-beet planter which required less seed and cut thinning costs, a beet topper, improved husking rolls for picker-huskers, equipment and methods for growing sweet potatoes that promised lower costs, improvements in machines for harvesting and putting up grass for silage, various new developments in flax harvesting and processing equipment, and further progress in improving cotton ginning and packaging.

The year's co-operative studies of paying farm uses for electricity brought results that included economical cooling of eggs, new facts on chick brooding, heating of hog farrowing houses, and warming of stock drinking water. (*See* also CHEMISTRY; CHEMURGY; INDUSTRIAL RESEARCH.) (H. G. K.)

Chemotherapy.

The following developments during 1941 may be largely attributed to war studies.

Interference with normal commerce produced a shortage or threatened shortage of imported drugs such as quinine, cod liver oil, ergot, digitalis, opium, henbane, essential oils, and intermediates used in the synthesis of potent drugs. Necessity served as the mother of invention, and American pharmaceutical firms learned to make their own intermediates. A large reserve stock of opium was placed in governmental vaults for safekeeping; steps were taken to grow increased amounts of digitalis, henbane and others in the U.S.A. and many drug formulas were changed to omit scarce essential oils. The only effective available substitutes for quinine in the treatment and prevention of malaria were atabrine and plasmochin. The drugs were formerly manufactured in the United States from intermediates imported from Germany and under German patents. The foreign patent control was severed by the U.S. government and methods for the preparation of the intermediates were perfected during the year. Similarly extensive investigation of the anti-malarial possibilities of various sulphonamide drugs was undertaken.

Substitutes for cod liver oil in the form of fish liver oils from other species were being increasingly developed. Of the essential constituents of cod liver oil, vitamin D is abundantly available through the irradiation of certain sterols; vitamin A has been synthesized but the process was in 1941 too costly to be commercially feasible. There was no curtailment of supplies of drugs for so-called "patent medicines" but it appeared that this might soon occur.

The sulphonamide group of drugs (sulphanilamide, sulphathiazole and sulphadiazine) was increasingly used both orally and locally in the treatment of contaminated wounds.

Mechanized warfare with its resulting large incidence of burns, particularly in aviators, stimulated research in the treatment of burns. The old tannic acid treatment of burns has largely given way to three new techniques of local treatment: The use of bacteriostatic, escharotic dyes such as gentian violet, brilliant green and neutral acriflavine either alone or in combination; the combination of tannic acid and silver nitrate; and the application of a protective covering of sulphadiazine by means of a spray.

The growing realization that many lives can be saved in peace as well as war if the effects of shock and haemorrhage can be more promptly counteracted brought certain developments: Portable plasma and serum kits for first-aid field use were developed.

Throughout the nation, stores of blood plasma and serum were being collected, desiccated and stored, and so-called "blood banks" were established in almost every large community. This, it may be said, constitutes the most important step forward in "first aid" in a quarter of a century.

The war stimulated research on drugs intended to combat fatigue and enhance endurance. There were many fantastic stories to the effect that the "blitzkrieg" successes of the Germans could be attributed in large part to the use of secret, stimulating drugs. There is no evidence of any truth in these tales. An "iron ration" kit from a German plane shot down over England was found to contain only such routine "stimulants" as chocolate, a beverage containing a small amount of caffeine and a small bottle of wine, alcohol content about 12%.

The widely publicized myth that gelatin and its principal amino acid, aminoacetic acid (glycine), are useful in counteracting fatigue was exploded. Amphetamine sulphate (benzedrine) appears to have some anti-fatigue effect but the danger of untoward action and collapse is too great to warrant its use except under carefully determined conditions.

The following contributions not primarily influenced by the war were made in 1941. Two new sulphonamide drugs acquired the stature of important drugs—sulphaguanidine for the treatment of intestinal tract infections, particularly bacillary dysentery; and sulphadiazine which appears to approach sulphapyridine in effectiveness in the treatment of pneumonia, and with the advantage that it does not have the same tendency to cause nausea and vomiting.

Certain protein derivatives such as para-amino benzoic acid present in the body and especially in high concentrations in pus were recognized as inhibitors of the sulphonamide drugs.

It has been known for a long time that certain bacteria exhibit antagonistic activities toward others. Based on this observation Rene J. Dubos of the Rockefeller Institute for Medical Research succeeded in isolating several species of aerobic sporulating bacilli from soil, sewage, manure and cheese which inhibited the activity of certain disease-producing organisms. From culture of these organisms he isolated two separate crystalline products, gramicidin which proved to be remarkably active against gram positive bacteria when applied to local infections, and tyrocidine which was found to be active against both gram positive and gram negative organisms in the test tube but thus far only active against pneumonia infections in mice. It is too early to determine what the practical significance of these findings will be.

English investigators found a harmless mould called pencillin which possesses a similar activity both in the test tube and in animals against pathogenic bacteria particularly those anaerobic organisms associated with gas gangrene infections. Up to Jan. 1, 1942, it had not been possible to grow and develop enough of this mould to make it available for general experimental use. Diethylstilbestrol (Stilbestrol), a synthetic substitute for the natural female sex hormone, was released for commercial distribution by the Federal Food and Drug administration.

The most outstanding example of a drug patent administered by a university, the insulin patent, expired on Dec. 23, 1941. Thus control of the strength, quality and purity of insulin passed from the University of Toronto. By enactment of a special amendment to the Food, Drug and Cosmetic act in record time in December congress made special provision for the continuation by the Food and Drug administration of the preshipment certification of insulin, a method of control which had previously proved so satisfactory in the hands of the University of Toronto.

Two new types of insulin with a prolonged duration of action, histone zinc insulin and globin zinc insulin, made their appearance during 1941. What advantages these possess over the previously available protamine zinc insulin is not yet clear.

There were indications that radioactive phosphorus may prove to be of unusual value, perhaps more so than any other agent now available, in the palliative treatment of the blood diseases, leucaemia and polycythemia.

Based on work done during 1941 there was a glimmer of hope that cancer cells exhibiting a selective affinity for certain radioactive elements might thus be successfully infiltrated and liquidated by direct atomic bombardment. This lead might turn out to be one of the most significant discoveries of all time or it could be just another failure to be added to the long list of false hopes in the treatment of cancer.

Immunization against tetanus (lockjaw) by means of a toxoid (a solution of detoxified toxin) proved practicable.

Phenylmercuric nitrate, aluminum hydroxide gel, cyclopropane, adrenal cortex extract, amylcaine hydrochloride, pernoston sodium, acetyl-beta-methylcholine, normal human serum and normal human plasma, anti-pneumococcic serum, types IV, V and XIV were among the important new drugs accepted during 1941 by the council on pharmacy and chemistry of the American Medical association. (*See* also DENTISTRY; PNEUMONIA; SURGERY; UROLOGY; VITAMINS.)

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Chemurgy. War conditions during 1941 hastened advances in many departments of chemurgic activity. Shortages of metals brought sharply to attention the field of plastics as a reservoir of alternate materials. Actual and probable interruptions of shipping led many industries to look to American farms for raw materials hitherto obtained abroad. Munitions manufacture called for more intensive use of agricultural products, such as corn for the industrial alcohol consumed in smokeless powder manufacture.

Rubber.—The war with Japan focused special attention upon rubber, of which the U.S. had on hand only a year's supply for normal purposes. Government attention, which had been directed toward increasing production of tree rubber in South America, was quickly gained for guayule, the sagelike shrub of the southwestern desert. Lack of research into soil and cultural requirements was an immediate handicap, but arrangements were being made at the year-end for utilizing all the available seed, enough for 45,000 ac. The seed had been accumulated by private interests working for some years with guayule around Salinas, Calif. The rubber is found in both stalks and roots of the guayule shrub, the content increasing each year of the plant's growth up to seven or eight years. The potential acreage suitable is difficult to estimate because of lack of data on the adaptability of guayule to the somewhat varied conditions of the arid areas where it will be tried. Native to Mexico, the plant itself has various forms.

Efforts were being made in late December to obtain from Russia seeds of kok-sagyz, a latex-bearing plant established as a crop by the soviet government. Widespread interest was created when the National Farm Chemurgic council published the first complete report on this possibly very important new rubber source. Belonging to the dandelion family and greatly resembling the common American dandelion, kok-sagyz was first noticed in the early 1930s by Russian plant explorers in a remote region near the Chinese frontier. It has been found highly adaptable to several soils, but yields best on highly structural black soils. The Russians have grown it in both northern and southern latitudes, and in 1941 had several thousand acres in production. The latex is obtained from the fleshy roots. The annual yield is from 150 lb. to 200 lb. of crude rubber per acre, according to Dr. Paul J. Kolachov, who prepared the Farm Chemurgic council report.

Minor Crop Products.—Curtailment of transatlantic ship movements created a conspicuous shortage of many minor crop products, such as those used for flavouring, aromatic and pharmaceutical uses. Sage and coriander were among those successfully produced for the first time on a commercial scale, several hundred acres of sage having been grown under contract. A co-operative for production and sale of coriander was formed by farmers in Kentucky. A summary of information regarding 131 crops, mostly in these categories, deemed worthy of investigation for possible production in the United States, was published in November.

Established chemurgic enterprises in several instances increased production heavily in order to meet demands. The United States was pronounced substantially independent of foreign sources for cigarette paper, as a result of facilities for doubled capacity in the domestic industry, completed in the late summer. The raw material used is the threshed straw of seed flax, obtained principally in Minnesota and California. Production of cotton grown to the specifications of the automobile tire industry, first announced in 1940, rose from 3,000 bales in 1940 to nearly 15,000 bales in 1941.

Oils.—The soybean crop rose from around 90,000,000 bu. in 1940 (double the output of 1935) to approximately 107,000,000 bu. The percentage of soybean oil industrially utilized again increased. Pressure upon diminishing supplies of drying oils turned the surfacing industries to larger use of domestic production.

Threatened shortage impelled the department of agriculture to guarantee a price of three cents a pound to growers of castor beans in 11 Texas counties in order to build up a supply of available seed. Production of castor beans on experimental scales increased in Illinois, Mississippi and some other states. The more efficient tung oil orchards along the Gulf coast enjoyed a prosperous year.

Miscellaneous.—Lend-lease demands for U.S. dairy production reduced the available domestic supplies of casein at a time when casein use in fibres was growing more general. The industry had to turn to Argentine casein as its principal source of supply. A number of new fabrics using casein fibre was announced, and consumption in felts for hatmaking passed out of the novelty stage.

Two white potato starch factories were erected in Idaho and began using up cull potatoes from the 1942 crop. A newly formed Idaho Chemurgic committee backed the factories, and set up a study program looking toward new crops and new uses for the agriculture of the state.

The Nebraska legislature appropriated $25,000 for a comprehensive survey of possible new uses for farm products of the state, and of new crops. The survey conducted by the state university got under way in September with Dr. L. C. Christensen as director. Because of readily available markets for sweet potato food and feed products, little advance was made in sweet potato starch production. A new factory for utilizing sweet potatoes was opened at Denton, Tex., where research in this crop has been led at the state teachers' college by Prof. Gilbert C. Wilson.

The National Farm Chemurgic council, with its principal office at 50 West Broad Tower, Columbus, O., is the clearing house for chemurgic information.

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(W. McM.)

Chess. Except for the soviet championship, international tournament chess was practically dead in Europe. Mikhail Botwinnik of Moscow regained his title of the U.S.S.R. in his usual masterful style. Gideon Stahlberg of Sweden won the accepted international tournament in Mar del Plata, Argentina, with Moishe Naidorf of Poland second.

Stahlberg broke the world's record for the number of boards played simultaneously and the time played. He played 400 separate games during 36 hr. 5 min., winning 364, losing 22 and drawing 14. He started playing at 10 P.M. on Friday, Aug. 29, and ended at 10:05 A.M. on Sunday, Aug. 31, without showing any signs of fatigue.

The world champion, Dr. Alexander Alekhine, whose residence is Lisbon, was reported to have visited Spain and Germany, but made no progress in arranging matches involving his title.

In the United States, chess thrived with renewed vigour, even though 1941 was the odd year in the series of biennial championship tournaments.

The national title held by Samuel Reshevsky of New York was contested for the first time under the auspices of the United States Chess federation. He was successful against the challenge of Israel A. Horowitz, champion of the erstwhile American Chess association. Reshevsky also competed in the New York state championship at Colgate university, losing to Reuben Fine, open champion of the United States federation. Their individual encounter was drawn.

Fine also won the championship tournament of the Marshall Chess club (N.Y.) and defended his title of open federation champion successfully in St. Louis when Herman Steiner of Los Angeles was runner-up. The only failure chalked up against Fine was his loss to Albert S. Pinkus, champion of the Manhattan Chess club (N.Y.), in the deciding match for the championship of the Chess league, won by the Marshall Chess club. The third of the series of invitation tournaments at Ventnor City, N.J., was won by Jacob Levin.

Intercollegiate Chess.—Yale repeated its triumph of the previous year in the H.Y.P.D. College Chess league, and Brooklyn college was also the successful defending champion in the Eastern Intercollegiate league. (J. B. P.)

CHIANG KAI-SHEK and Mme. Chiang in their home at Chungking in 1941. In the background is an autographed photograph of President Roosevelt, presented by Lauchlin Currie, Roosevelt's special envoy who arrived at Chungking in February

Chevrolet, Louis (? –1941), U.S. motor car pioneer, was born in La Chaux de Fonds, Switzerland. His family moved to France while he was still a boy. In 1900 he went to the United States, where he became famous as a racing driver. He piled up speed records and in 1905 when the phrase "mile-a-minute" represented dizzy speed, Chevrolet raced over a measured mile in 52.8 seconds at Sheepshead Bay, N.Y. In 1911 Chevrolet built and designed, with the co-operation of William C. Durant, the first Chevrolet car. Although the car pioneered many automotive developments, Chevrolet had little faith in it and sold out his holdings to Durant in 1911. Chevrolet, however, retained his interest in racing cars and built the Frontenac racer in 1911.

He died at his home in Detroit, June 6.

Chiang Kai-shek (*c.* 1886–), creator of China's modern army, chief of the ruling party, builder of the National government, and unifier and symbol of a new, progressive and united China, came from a humble family in Feng-haw, Chekiang province, and rose from poverty and hard-

ship by his own efforts. His ambition and patriotism incited him to study military science in the Chinese and Japanese military colleges from 1906–10. In 1910 Chiang became a loyal follower of Sun Yat-sen and in 1923 was sent to Russia to study soviet military methods and political institutions.

Nationally known as president of the Whampoa Military academy in 1924 and virtual master of Kwangtung province in 1925, Chiang appeared upon the world scene as generalissimo of the Nationalist northern expedition in 1926. Breaking relations with the communists, Chiang established the National government at Nanking in 1927. In December he married Mayling Soong and subsequently was converted to Methodism. Since 1927 Chiang has been continuously in power: by political manoeuvring he outlasted his opponents and in the name of the central government he crushed the rebellions of 1929–36. His ten years' campaign against the communists was brought to an end by the Sian incident of Dec. 1936.

After the outbreak of the war with Japan, Chiang's leadership had been unchallenged and his determination to resist Japan to the bitter end deepened the people's confidence in him. Early in 1941 Chiang declared that China had long ago cast its lot irretrievably with the democracies. Instead of resistance and reconstruction he began to enunciate victory and security as China's war aims. China's resistance and independence rest greatly on Chiang's life, activity and support, as he is chief of the Kuomintang and its youth corps, premier, president of the Supreme National Defense council, commander in chief of all military forces, chairman of the People's Political council and president of the combined national central banks in addition to other leading social, economic and educational posts. (*See* also CHINESE-JAPANESE WAR.)

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Chicago. Second largest U.S. city, a port of entry and the county seat of Cook county, Ill., at the southwest corner of Lake Michigan, Chicago is the largest centre of rail traffic and of long-distance air routes. As a port, Chicago is mainly important because of a great tonnage of ore, fuel and fluxes for steel manufacturing, conveyed by lake ships, and for oil products conveyed by tanker barges and ships. It has access to the Gulf of Mexico via the Illinois waterway and the Mississippi river, and to the Atlantic via the St. Lawrence river and the Welland canal, but both routes can accommodate only small ships. The population of the city proper by the federal census of 1940 was 3,396,808, which included 1,686,648 males and 1,710,160 females. The white population numbered 3,115,379; nonwhite, 281,429. The population of the 1,119 sq.mi. comprising the metropolitan district was 4,499,126. As a result of increased employment, a slight rise in the birth rate was noted by the autumn of 1941 after a long decline which had lowered the average Chicago family to less than three persons, in contrast to a national average of 3·8 persons. The number of marriage licences issued in 1941 exceeded 48,000, nearly 4,000 in excess of the number issued in 1940—the previous all-time high record. The mayor (Jan. 1, 1942) was Edward J. Kelly.

War and munitions manufacture dominated all phases of Chicago life in 1941. At the close of the year, 1,285 concerns in the Chicago industrial area had received 5,777 military contracts, with a total value of $1,247,479,000. Of that amount, $386,052,000 was for construction of munitions plants, including the two government ordnance plants at Elwood and Kankakee, southeast of the city, which together cost approximately $95,000,000 and went into production near the end of the year. A private aviation engine plant at Melrose Park, erected at a cost of $41,867,000, began turning out motors at the end of 1941. Expansion of the steel industry in the Calumet river area south of the city involved expenditures of $135,000,000. Steel mills, in full blast throughout the year, operated at a rate of 109% of theoretical capacity in the last week of 1941. On the outbreak of war, recruiting offices in Chicago were crowded; there were 4,468 volunteer enlistments before the end of the year. Some 42,695 aliens were naturalized in 1941.

Increased employment reduced the number of cases handled by relief agencies to 103,781 in Dec. 1941. In addition to the local workers employed in war industries, 2,951 federal employees were transferred to Chicago from Washington, D.C., to relieve congestion in the capital. Despite the delay in completing the city's new subway system, caused by the needs of the arms industries for all available metals, Chicago's transit systems carried 27,000,000 more passengers in 1941 than in 1940.

Chicago's tentative budget for 1942 was set at $166,138,734. Subject to state legislative approval, usual expenditures of $3,000,000 for new bridges and streets were to be diverted to civilian defense measures. The civilian defense organization of the Chicago area was headed by Mayor Kelly.

Chicago was devoid of outstanding political events in 1941. The city council passed 3,883 ordinances, orders and resolutions —all routine and noncontroversial. On Dec. 4, 1941, Chicago witnessed the birth of a new morning newspaper, the *Chicago Sun,* founded by Marshall Field, grandson of the city's greatest merchant. The journal was launched 115 days after the decision to establish it.

Chicago's long fight against organized crime which totally eliminated gang murders in 1940, continued successfully in 1941. No city policeman was killed, but two policemen of the park commission were slain by outlaws. Police killed 12 criminals in acts of banditry, and private citizens slew five. A total of 1,030 convicted felons, including 12 women, were sent to state prisons, and two were executed. (L. H. L.)

Chicago, University of. An institution of higher education and research in Chicago, Ill. Founded in 1891, the university is privately endowed, co-educational and nonsectarian.

During the summer quarter of 1941, 4,157 students attended the university, of whom 2,103 were men and 2,054 were women. The total enrolment for the academic year 1940–41 was 11,897, an increase of 223 over the previous year. The home study (correspondence) department had a total enrolment of 3,704, which is exclusive of the totals given above. The university granted 1,581 degrees during the academic year; 514 were master's degrees and 174 were doctorates of philosophy.

The total funds of the university as of June 30, 1941, amounted to $128,781,040, an increase of $245,014 over the figure for the same date in 1940. These funds were divided into: endowment, $73,320,043; plant, $45,602,875; and other funds, $9,858,122.

The total income of the several divisions of the budget was $8,571,890, an increase of $66,904 over the income of the previous fiscal year. This total of budget income does not include income of auxiliary enterprises such as residence halls, commons, bookstores and student social facilities, nor restricted expendable funds. Including such income, the total current income for 1940–41 was $10,929,256. The total amount of gifts paid in for the year ending June 30, 1941, was $3,307,498.

Approximately 29,367 volumes were added to the university's libraries, bringing the total to 1,330,152.

During the academic year 1940–41 the university celebrated its 50th anniversary. At a special convocation on Sept. 29 climaxing the celebration, the university awarded 35 honorary degrees.

Ten thousand persons, including more than 400 delegates from colleges, universities, learned societies and foundations, attended the scientific and scholarly symposia and academic festival climaxing the year-long celebration.

Child Labour.

The spread of war conditions throughout the world made it everywhere difficult, and sometimes impossible, to hold social gains for children which had been built up over many years. With the intense pressure for defense production, child-labour standards tended to be lowered along with other labour standards. Nevertheless, it was significant that there was in many countries a growing recognition of the fact that if the civilization for which the fight was being waged was to survive in the end, there had to be special attention paid to protection of the growing generation from premature and excessive child labour.

United States.—The 1941 picture of the employment of children and youth in the United States was dominated by the growth of the national defense program and would be influenced to a still greater degree by the entrance of the United States into the war. The first effect on youth of increasing defense production was the opening up of many employment opportunities. Federally sponsored technical courses in high schools, colleges and evening schools trained thousands of youths for jobs in defense industries. But while much-needed work opportunity was given to unemployed youth, new child-labour problems were created relating to the employment of children under 16 who should remain in school and the employment under unfavourable conditions of minors of 16 and 17.

The Fair Labor Standards Act.—The most significant single happening of the year in the child-labour field was the decision of the United States supreme court on Feb. 3, 1941, in the case of The United States *v.* Darby Lumber co. *et al.*, upholding the constitutionality of the Fair Labor Standards act. This act through its child-labour provisions established in effect a basic minimum age of 16 for employment in industries producing goods shipped in interstate or foreign commerce and an 18-year minimum for employment in hazardous occupations. The unanimous decision of the court expressly overruled the case of Hammer *v.* Dagenhart which in 1918 had held the first federal child-labour law unconstitutional. This opinion not only marked a long step in social advance in the field of labour standards but removed all doubt as to the validity of child-labour regulation based on the power of congress to regulate interstate commerce. The establishment on a sound constitutional basis of a federal minimum child-labour standard was especially important in view of the rapid increase in the numbers of employed youth. In the administration of these child-labour provisions by the children's bureau of the United States department of labour, the agency charged with their enforcement, significant progress was made during the year 1941.

The co-operative relationships with state labour and education officials throughout the country in making certificates of age available as proof of age for minors employed in industries coming under the act were strengthened, thus building up the administration of state laws at the same time that the federal law was made more effective. The group of jurisdictions where state certificates were accepted as proof of age under the federal act was increased to 47 by the addition of Louisiana, Nevada and Puerto Rico.

The program of protection of minors from hazardous occupations carried on under the act was especially important in view of the increasing number of industrial accidents due to accelerated production and in view of mounting health hazards due to possibility of greater exposure to industrial poisons and of increased fatigue incident to speed-up and longer hours. Two hazardous occupations orders setting in effect a minimum age of 18 years were issued during 1941. The first covered all occupations in logging and all occupations in the operation of any sawmill, lath mill, shingle mill or cooperage-stock mill, with certain exceptions, and the second applied to occupations involved in the operation of power-driven woodworking machines. The research necessary as a basis for orders dealing with shipbuilding occupations and occupations involving exposure to radioactive substances was completed, and investigations were under way in the metal industries.

Inspections of establishments producing goods shipped in interstate commerce resulted in the removal of many children from employment contrary to the act, and the influence of these inspections and of the educational program carried on by the children's bureau extended far beyond the number of places of employment actually visited.

Extent and Character of Child Labour in the United States.—Preliminary estimates of the numbers of children and young persons employed, based on the 1940 census, were published in 1941. They showed in round numbers 4,800,000 boys and girls 14 and 15 years of age living in the United States, and 4,900,000 boys and girls of 16 and 17 years—increases of 4% and 5% respectively over 1930. Of this number, 255,336 14- and 15-year-old children and 1,047,316 16 and 17 years of age were "in the labour force" of the country at the time the census was taken, in the last week of March 1940. About two-thirds (890,976) of the boys and girls between 14 and 18 years of age in the 1940 "labour force" were reported as actually employed during the census week, including 213,104 children of 14 and 15 years and 677,872 of 16 and 17 years. No data showing the industries in which these young people were employed were available (Jan. 1, 1942).

A comparison between the number of youth recorded in 1940 as "in the labour force" and those recorded as "gainful workers" in 1930 indicated a striking decrease in child employment during the decade, particularly in the younger group 14 and 15 years of age. This decrease was to be expected, because during the depression years there had been fewer job opportunities for children as well as adults, and there had been also a definite advance in state and federal child-labour standards, especially toward establishing a 16-year minimum age for employment. (*See* also CENSUS.)

Though significant, these figures do not give a complete picture. In both 1930 and 1940 the fact that the census was taken in early spring inevitably resulted in omitting from the count many children employed in agriculture. Moreover, the 1940 census collected no data for working children under 14.

The child-labour picture, moreover, changed markedly after March 1940. Even then, mounting production under the program of national defense was decreasing unemployment and putting men to work. Any upswing in general employment tends to be accompanied by an increase in child labour. At first older workers were called upon but there was a sharp increase in employment of boys and girls 16 and 17 years of age, and, along with this, a rise was also occurring in the employment of children under 16. The younger children went chiefly into nonfactory jobs employment for the most part less regulated by law than work in the defense industries.

Legislation.—Forty-three of the 48 state legislatures met in regular session in 1941. Despite the fact that for the first time within recent years there were decided pressures to break down existing child-labour standards, and that many proposed advances in standards were defeated, some improvements were made. In Florida a complete revision of the child-labour law established a basic minimum age of 16 years for employment, and an 18-year minimum age for employment in many hazardous occupations. In Hawaii an important aid in administration was put into effect by increasing from 16 to 18 the age under which employment certificates are required. In New Jersey a new law regulating industrial home work requires employers to obtain permits to use home workers and to pay an annual graduated fee depending upon the number of workers employed, and also requires each home worker to obtain a certificate; no certificates are to be issued to minors under 16 years of age.

Great Britain.—By the latter half of 1940 it was recognized that the excessive lengthening of hours for all factory workers, involving relaxation of all control of hours of young persons and women, which had occurred under the extreme pressures consequent on the fall of France in May, was a short-sighted and uneconomical policy, in that the abnormal strain of long hours resulted in a lowered production level, increased lost time from sickness, exhaustion and other causes, as well as a reduction in hourly output. Working hours were shortened, and the ministry of labour announced that the provisions of the Factories act limiting hours of work of women and young persons would be fully enforced, subject only to emergency orders of the secretary of state or of the ministry of labour and national service.

The impact of war conditions in many localities lowered compulsory-school-attendance standards and increased employment of children of school age on farms and in stores. During 1941, however, efforts to make schools available and to keep children in attendance were intensified.

Canada.—In Canada, employment expanded during 1941, and it was reported that in Ontario, the most important manufacturing province of the dominion, the number of children 14 and 15 years of age exempted from school attendance for employment increased. It was, therefore, significant that legislative advances were made in the field of school attendance laws. In New Brunswick, where school attendance previously had been compulsory only in a few towns, a law effective July 1, 1941, made attendance up to 14 years compulsory throughout the province and prohibited the employment of a child of school age during school hours unless he had completed the eighth grade, or unless, in the opinion of the school inspector, he should be exempted from further attendance. In Prince Edward island and Alberta compulsory school attendance standards were raised.

Union of South Africa.—In the Union of South Africa a law put into effect Sept. 1, 1941, raised the basic minimum age for employment in factories from 14 to 15 years. The law also contained measures for the better protection of the health of workers of all ages.

India.—The Bombay Shops and Establishments act which went into effect in Nov. 1940 prohibited the employment of children under 12 in shops, fixed closing hours and limited hours of work. It was estimated that more than 2,000 children under 12 years of age who had been previously employed in restaurants were eliminated from such employment. A similar act received the assent of the governor of the Province of Sind on Dec. 19, 1940.

British Colonies and Dependencies.—An ordinance put into effect in British Honduras in Nov. 1940 established a basic minimum age of 14 for employment of children, with certain exceptions for children between 12 and 14 years of age employed outside school hours. In the West Indian Colony of St. Vincent (Windward Islands), an ordinance of Sept. 17, 1940, prohibited the employment of children under 14 years of age, except in light agricultural or horticultural work for parents on the family farm outside school hours. In Northern Rhodesia (Africa), a general minimum age of 12 years was fixed in the latter part of 1940 for admission to employment.

Continental Europe.—Because of war urgencies prevailing in the greater part of continental Europe, little information in regard to labour conditions relating to young persons was available.

Germany.—An order of the minister of labour dated Jan. 11, 1941, called attention to existing provisions prohibiting the employment of women in unhealthful occupations and prescribing that exemptions to these regulations should be granted only in individual cases where particularly strong grounds existed and where special provision was made for protection against health risks. A previous order issued Sept. 13, 1940, had prohibited employment of both girls and boys under 18 at furnaces and on grinding work of any kind and required periodical physical examinations of all workers employed in certain hazardous occupations, including the production of mixtures with a lead content.

Switzerland.—A Swiss federal act of Dec. 12, 1940, regulating industrial home work, required the posting of schedules of rates of remuneration, prohibited children under 15 years of age from employment as home workers on their own account, and prescribed conditions for giving out home work aimed to prevent employment at night or on Sundays and public holidays.

Brazil.—The outstanding legislation for the protection of working children in South America enacted during 1941 was the child-labour law of Brazil, approved on Sept. 13, 1941, to go into effect Jan. 1, 1942.

Federal regulation of child labour in Brazil was begun under a law passed in 1927 and continued by a decree of 1932 and by the Federal Constitution of 1937, which approved the principle of the minimum age of 14 for all employment.

The 1941 law was the result of the report of the special commission appointed by the government in 1940 to study the possibility of bringing the child-labour law into line with the draft conventions approved by the conferences of the International Labour organization. The basic minimum age for employment remained 14 years, but the law made no exemptions for economic need. It applied both to industrial occupations and to nonindustrial occupations other than agriculture, exempting domestic service and workshops which employed exclusively members of the child's family and in which the child was under the direction of parent or guardian. Agricultural work was directly covered by its provisions only when industrial processes were used, but subsequent regulations were to determine whether or not the law was to be applied to other kinds of farm work. The law also set up new regulations for the work of children in street trades.

An outstanding advance in administrative procedure was the requirement of an employment certificate (*carteira de trabalho do menor*) for all children between 14 and 18 years of age going to work. To obtain a certificate the child had to present to the issuing officer proof of age, the parent's authorization for his employment, physician's certificate of physical fitness, proof of literacy, his photograph and a statement from the employer as to the kind of work that the child was to do.

The law was to be enforced in the federal district by the bureau of labour, national department of labour, industry and commerce, elsewhere by the regional offices of that department, or in the absence of such offices, by especially designated officials.

International Labour Office.—The International Labour office continued to carry on its work in Montreal, Canada, and held its first conference since 1939 in New York city, in Oct.-Nov. 1941. The conference did not undertake the adoption of conventions, but planned discussions to be utilized as a basis for the future consideration of international labour treaties. This meeting constituted a significant step in the framing of future social policy in labour matters through free co-operative international effort. Successful development of collaboration between employers' and workers' organizations and between these groups and government was emphasized as an indispensable condition of the continued existence of the democratic way of life.

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(B. Mc.)

Children's Books.

The children's books of 1941 showed an increased interest in the history and in the ideals of the United States, evidenced by such biographies: *Walt Whitman* by Babette Deutsch, Howard Fast's *Haym Salomon* and Jeanette Eaton's *Narcissa Whitman;* books of historical interest: Genevieve Foster's *George Washington's World,* Carolyn Bailey's *Homespun Playdays* and Maud and Miska Petersham's *An American ABC;* and books descriptive of the United States: Ann Clark's *In My Mother's House* with illustrations by Velino Herrera, Holling C. Holling's *Paddle-to-the-Sea,* Marshall McClintock's *The Story of the Mississippi* and Mable Pyne's *The Little Geography of the United States.*

Stories of other times in the United States were *The Crimson Shawl* by Florence Choate and Elizabeth Curtis, *Coat for a Soldier* by Florence Updegraff, *Indian Captive* by Lois Lenski, *The Matchlock Gun* by Walter Edmonds, *Nathaniel's Witch* by Katharine Gibson, *John of Pudding Lane* by Mabel Hunt, *Delecta Ann* by Myna Lockwood, *Little Town on the Prairie* by Laura Wilder, *The Middle Button* by Kathryn Worth.

Other good stories were *The Mofats* by Eleanor Estes, *The Saturdays* by Elizabeth Enright, *Lottie's Valentine* by Katherine Eyre, *Captain Kidd's Cow* by Phil Stong, *Tag-along Tooloo* by Frances Sayers, *Whispering Girl* by Florence Means, *Canthook Country* by Merlin Ames, *World Series* by John Tunis, *Blueberry Mountain* by Stephen Meader, *The Melforts Go to Sea* by Geraldine Pederson-Krag, *A 'Prentice of Old London* by Janet Marsh.

Interest in South America brought *The Pageant of South America* by Anne Peck, Richard Gill and Helen Hoke's *The Story of the Other America,* Alice Dalgliesh's *Wings Around South America,* and Delia Goetz's *Neighbors to the South.*

Books about Mexico included Elizabeth Tarshis's *The Village That Learned to Read,* Ruth Sawyer's *The Least One* and a collection of folk tales by Dan Storm called *Picture Tales from Mexico.*

The war brought such books as Creighton Peet's *Defending America* and Paul Brown's *Insignia of the Services,* numerous books about aeroplanes and fighting ships, and a number of books about refugee children.

Among many biographies were Elliott Arnold's *Finlandia* (Sibelius), John Erskine's *Song Without Words* (Mendelssohn), Madeleine Goss's *Unfinished Symphony* (Schubert), Claire Purdy's *Song of the North* (Grieg), Laura Benét's *Young Edgar Allan Poe,* Alvin Harlow's *Joel Chandler Harris,* Jeannette Nolan's *James Whitcomb Riley* and Howard Fast's *Lord Baden-Powell.*

Picture books included Robert McCloskey's *Make Way for Ducklings,* Wanda Gág's *Nothing At All,* William Du Bois's *The Flying Locomotive,* and the d'Aulaire *Leif the Lucky.* Virginia Burton's lively *Calico, the Wonder Horse* was a book of 1941 which should begin a movement to laugh the ubiquitous "comic books" out of existence.

Science books included Harriet Huntington's *Let's Go to the Seashore,* Henry Kane's *The Tale of the Bullfrog* and Harry Hoogstraal's *Insects and Their Stories.* Other good informational books were Harold Keith's *Sports and Games,* Anne White's *Lost Worlds,* Nina Jordan's *American Costume Dolls.*

Some additions to imaginative literature for children were Anne Malcolmson's *Yankee Doodle Cousins,* James Bowman's *Winabojo, Master of Life,* Mabel Beling's *The Wicked Goldsmith,* Ruth Sawyer's *The Long Christmas,* Dorothy Lathrop's *The Colt from Moon Mountain,* with new retellings of *Beowulf* and *Peer Gynt* by E. V. Sandys, and a new edition of Esther Shephard's *Paul Bunyan* with illustrations by Rockwell Kent. Poetry was best represented by Louis Untermeyer's *Stars to Steer By.*

The Junior Bookshelf ceased regular publication with the July 1941 issue because of the almost total lack of new children's books in England, but with the promise of further issues when-

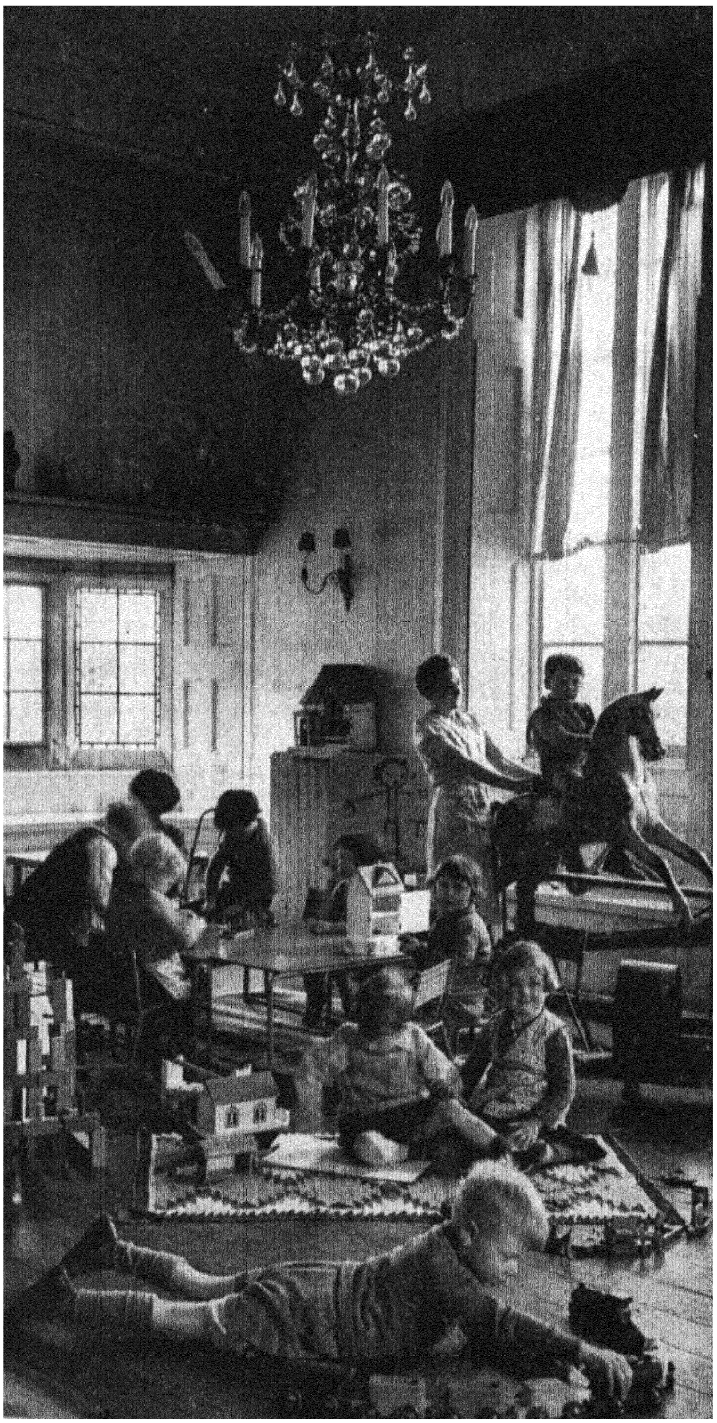
ever opportunity might permit.

More than 900 books for children were published in the United States in 1941, but all signs pointed to a decrease in this number in 1942. (*See* also LITERARY PRIZES; PUBLISHING [BOOK].)

(S. AN.)

Children's Bureau, United States: *see* CHILD LABOUR; CHILD WELFARE; JUVENILE DELINQUENCY.

Child Welfare. The status of children in 1941, with the destruction and privations of the war prevailing in so many lands, differed greatly in the various parts of the world. In Europe, original proving ground of child-welfare work, the disorganization of normal protective work for children continued, although, in Great Britain at least, many prewar services for children were maintained. In the British dominions, where improved child health was one of the chief defense aims, determined efforts were made to maintain standards. In Latin America, with the growing realization of the social value of child welfare, increasing stress was laid on better protection of the child. In the United States plans were made and foundations laid for a defense program of child health and welfare which merged at the year's end into a wartime program for child protection.



AUTHOR J. B. PRIESTLEY ran a nursery school for evacuated British children in 1941 at a former country estate in Herefordshire

United States.—Extensive migration to military and industrial defense areas affected both the children in migrant families and the children living in areas where population increased more rapidly than community facilities and services. The rapid completion of public housing projects during the fall of 1941 improved the housing situation in some areas, but many families were still using overcrowded and unsuitable dwellings and trailer camps. Because state and local governments were not able, with available funds, to expand adequately health and social services and hospital facilities needed especially for mothers and children living under unstable community conditions, federal funds were appropriated for community facilities in defense areas. Of the first $150,000,000 appropriated, about 30% of the amount so far allotted was for schools.

Responsibility for planning for the protection of the civilian population was placed by the president with the Office of Defense Health and Welfare Services and the Office of Civilian Defense (*q.v.*). In co-operation with these agencies the children's bureau of the United States department of labor, the Office of Education of the Federal Security agency and other federal agencies dealing with children participated in making plans for child protection. Among the programs launched or in preparation in 1941 in which provision for children and youth was an important factor were the nutrition program stimulated by the National Nutrition Conference for Defense May 26–28, 1941; programs for recreation and social protection in military and industrial defense areas; provision of day-care for children of employed mothers; training of volunteers for community service including special programs for children; and plans for possible evacuation of children and mothers from areas that might be affected by war emergencies. Upon state and local health, welfare and school officials fell the immediate responsibility of working out with state and local defense councils plans for improving living conditions for families in local defense areas.

Under the guidance of the National Citizens Committee of the White House Conference on Children in a Democracy follow-up conferences were held in several states in 1941. The first Puerto Rican Child congress was held Dec. 4–7, 1941. State and local organizations concerned with the welfare of children continued to study the recommendations of the White House Conference on Children in a Democracy in order to strengthen community programs for children.

Vital statistics for 1940 issued by the United States bureau of the census recorded 2,360,399 live births and a birth rate of 17.9 per 1,000 population, continuing the upward trend in the birth rate since the low point (16.5) in 1933. Further declines occurred in maternal and infant mortality rates. The maternal mortality rate for 1940 was 38 per 10,000 live births, compared with a rate of 40 in 1939 and 59 in 1934. The infant mortality rate for 1940 was 47 per 1,000 live births, compared with 48 in 1939 and 60 in 1934. Figures so far available for 1941 indicated that in general conditions were favourable for the health of mothers and children, although in the eastern and southern states there was a serious epidemic of poliomyelitis with more than 8,500 cases reported. (*See* also BIRTH STATISTICS; CENSUS, 1940; INFANT MORTALITY.)

The state health officers who administer maternal and child-health programs with the aid of federal funds reported, for the year ended June 30, 1941, increased attendance at prenatal clinics and child-health conferences; greater emphasis on nutrition; the provision in additional areas of home-delivery-nursing service and nurse-midwife service; and increased amounts spent for hospitalization of mothers and children. Federal funds for maternal and child-health services expended by state health agencies under plans approved by the children's bureau during the fiscal year ended June 30, 1941, totalled $5,336,019. The federal grants matched in part with state and local funds brought the combined program close to $9,000,000 for the fiscal year 1941 and would bring it to more than $11,000,000 for 1942. Many local defense areas still lacked the basic essentials for conducting a maternal and child-health program, namely, a full-time local health unit and a staff of public-health nurses. Difficulty was being experienced in expanding maternal and child-health services and in retaining doctors and nurses for civilian service because of the medical needs of the

armed forces.

A total of 307,478 crippled children were listed on state crippled children's registers on June 30, 1941, an increase of 15% over the preceding year. Twelve states and Puerto Rico reported fewer than 5 children per 1,000 under 21 years of age so registered as compared with 7 states that reported 10 to 12 registered, an indication that the process of locating crippled children is not yet complete. Federal grants for services for crippled children made through the children's bureau to the state crippled children's agencies totalled $3,919,837 in the year ended June 30, 1941. Federal funds for services for crippled children expended by the state crippled children's agencies under plans approved by the children's bureau amounted to $3,777,113 for the fiscal year ended June 30, 1941. Together with state funds that matched the federal funds in part the expenditures reached approximately $6,700,000 for the fiscal year 1941 and were expected to reach about $7,500,000 for 1942. These funds were used for locating crippled children and for providing medical and surgical care, diagnostic and treatment service, hospitalization and aftercare services.

The federal-state program for child-welfare services administered by the children's bureau provided for local child-welfare workers paid in whole or in part from federal funds in 533 counties or local areas, mostly rural, and for supervisory service in state welfare departments during the year ended June 30, 1941. Federal funds expended by the state welfare agencies for this purpose totalled $1,523,820. Great need for child-welfare service became evident in military and industrial defense areas because of family insecurity, juvenile delinquency and other problems, but limited funds made it possible for the state welfare departments to provide workers in only 73 local defense areas in their plans for the fiscal year 1941-42.

During 1941 Illinois and Texas were added to the states receiving federal grants for aid to dependent children, administered by the Social Security board of the Federal Security agency. Forty-four states, the District of Columbia and Hawaii were receiving such grants at the close of 1941. During Sept. 1941 payments were made for 926,149 children in 383,796 families. The average monthly benefit per family was $32.73 representing a range from $13.38 in Arkansas to $55.41 in Massachusetts.

Benefits for surviving children under old-age and survivors' insurance, also administered by the Social Security board, first became payable during 1940. During the first six months of 1941 the number of children awarded monthly benefits totalled 38,618, and the monthly benefits reached $471,020.

A number of states enacted laws for the protection of children during 1941. New adoption laws or significant revisions of existing laws were enacted in five states. Social-work procedures in court actions to establish the paternity of a child were authorized in two states. The supervisory responsibility of the state department for children away from their homes was extended in three states. Significant changes in the juvenile-court laws or in the organization of juvenile courts were authorized in three states. Commissions for study of problems of youthful offenders or juvenile delinquents or for revision of child-welfare laws were created in four states.

The birth-registration laws of more than one-fourth of the states were revised completely or were amended to include new or improved provisions relating to protection of records from inspection, delayed or altered registrations, registration of foundlings and changes in birth records on adoption or legitimation of a child. Following the precedent established by 19 states, several states enacted laws requiring physicians attending pregnant women to arrange for a serological test for syphilis; and six states were added to the group of 20 states requiring a physical examination and serological tests for syphilis of all applicants for a marriage licence. (*See* also MARRIAGE AND DIVORCE.)

The children's bureau maintained close correspondence with officials and others responsible for services for children in the other American republics. The children's bureau participated actively in the program of the Interdepartmental Committee on Cooperation with the American Republics. Consultation service was given on request to the National Children's bureau of Brazil during 1941 and staff members visited also Argentina, Uruguay, Mexico and Central America. A member of the bureau staff was being assigned to serve as child-welfare consultant to the American International Institute for the Protection of Childhood, which had headquarters at Montevideo, Uruguay. Another representative was being assigned, on request, to give consultation service to the government of Paraguay in the development of work for children.

The children's bureau assisted in developing plans for the visit to the United States, in June 1941, of directors of 15 schools of social work in the other American republics and assisted in making scholarships available to graduates of these schools for study in schools of social work in the United States in 1942.

On April 1, 1941, an act of congress was approved appropriating funds for holding the Eighth Pan American Child congress in the United States. The congress was planned to be held May 2–9, 1942. The chief of the children's bureau was appointed chairman of the United States organizing committee for the congress.

Latin America.—Progress was noted in Latin America in the development of systems of social insurance which benefit workers and their families. In Panama, by a law of March 21, 1941, social insurance was made compulsory for government employees and large groups of private workers. Bills for social insurance were introduced in the national legislatures of Bolivia, Colombia and Costa Rica; in Brazil a committee was preparing a plan for sickness insurance; in Mexico a committee was drafting a general social-insurance bill; and in Chile, where a social-insurance law had been in effect since 1924, a government bill for a complete reform of the system was introduced on June 14, 1941.

Improvement in nutrition, a comparatively new subject on the social-welfare program of the Latin American countries, received much attention. In Bolivia, a bureau of nutrition was organized, and in Brazil, a social-insurance nutrition service for persons covered by social insurance and their families. The "first national dining room," which served also as a centre of education in nutrition, was opened in Mexico City in Nov. 1941, and three more were to be opened.

A national board of maternal and child welfare began to function in Jan. 1941 in the Dominican Republic for the purpose of improving health services for mothers and children.

In Mexico, where very little use had been made of foster-home placement of children, the advantages of this method of child care were being recognized, and in Oct. 1941 the department of public welfare announced a plan for the transfer of young children from a public institution in Mexico City to foster homes, beginning early in 1942.

In the federal district of Mexico the legislation on juvenile courts was amended and codified by a law of April 27, 1941. Each juvenile court was to consist of three members: a lawyer, a physician and a teacher; stress was laid on the individual treatment of each case, and on prevention and rehabilitation.

In Peru the education law of 1941, repealing a law of 1920, made school attendance compulsory for children 7 to 16 years of age unless the child received earlier a certificate of elementary instruction. In this law many new measures were prescribed for the care of school children's health, such as regular medical examinations, dental services and sanitary inspection of schools. The law pointed out the urgent need of schools for Indians and for rural inhabitants, and for an educational program, even in the primary schools, which would meet the every-day needs of the people. Registration of all agencies engaged in maternal and child-welfare work in Peru was ordered by a presidential decree of Aug. 4, 1941.

Brazil enacted a new child-labour law, which marked a notable advance in standards of child employment. (*See* CHILD LABOUR.)

Great Britain.—In Great Britain health services for children were maintained and in some ways strengthened even under war conditions. For the 2,250,000 mothers and children who were evacuated from bombed cities to areas of relative safety during the first 18 months of the war, the public authorities were able to provide most of the health services of normal times, including school medical services, child-health clinics, public-health-nursing services, midwife services and maternity care in hospitals. Welfare officers (social workers) were added to local health department staffs in many of the provinces. Steps were also taken toward introducing or expanding in the reception areas nursery education, child-guidance work, community social work and communal feeding. In a report issued in June 1941 the home department estimated that the increase in indictable offenses committed by children under 14 during the first year of the war amounted to 41% and described the program of varied social and recreative facilities for young people developed to offset the effect of absence of parents from the home, interrupted school attendance and the temptation to spend unwisely the relatively high wages paid to boys in war industries. (*See* also CRIME.)

British Dominions.—In Australia, under the child endowment act effective July 1, 1941, an allowance of five shillings was paid weekly for each child under 16 in the family, except the first, irrespective of the amount of the family's income. In New Zealand new health benefits were introduced in 1941, available to all residents covered by the Social Security act of 1938, irrespective of economic status, race or nationality. These benefits consisted of attendance by a physician (except in specified cases), out-patient treatment in hospitals and provision of medicines and other pharmaceutical materials.

Continental Europe.—From what little information was available from Europe it appeared that few new laws in the field of child welfare were enacted. In Spain a law of Dec. 30, 1940, amended and consolidated the previous laws on juvenile courts, giving them jurisdiction in cases of children under 16 accused of crimes or misdemeanours, those who were prostitutes, or vagrants, or who presented other serious problems of behaviour, and those who were neglected or mistreated by their parents or guardians. Spain, following the example of Germany and Italy, also began to make loans from the national treasury to eligible newly married couples. These loans were repayable in monthly instalments of 1%; part of the loan was cancelled on the birth of each child. On Oct. 20, 1941, Italy, following the precedent of Germany, ordered the reporting of births of deformed children and of those with defects likely to cause disability. (*See* also SOCIAL SECURITY.)

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Chile, a republic on the west coast of South America, extending some 2,800 mi. from just within the tropics to the subarctic south. Area, 289,776 sq.mi.; population (Nov. 28, 1940 census), 5,023,539; capital, Santiago; religion, Roman Catholic; acting president, Jerónimo Méndez (succeeding President Pedro Aguirre Cerda [*q.v.*], deceased Nov. 25, 1941).

Population.—The Nov. 28, 1940 census, details of which were made public in 1941, showed a population of 639,546 for Santiago, or 943,669 including suburbs. The 20 other principal cities (not

including suburbs) were: Valparaiso (215,614); Concepción (92,364); Temuco (84,696); Viña del Mar (70,013); Osorno (62,106); Chillán (61,535); Talca (56,735); Los Angeles (52,259); Antofagasta (51,107); Valdivia (49,481); Puerto Montt (44,024); Talcahuano (41,536); Iquique (39,282); Rancagua (38,423); Linares (36,403); Curicó (35,270); La Serena (35,055); Nueva Imperial (33,361); Magallanes (Punta Arenas), southernmost city in the world (33,134); Cauquenes (33,116). Population figures are for municipalities, which usually embrace considerably larger areas than do conventional Anglo-Saxon cities. More than 3,000,000 of the population was in the central section of the country, less than 600,000 in the four northernmost provinces, and nearly a million and a third in southern Chile (south of the Bio-Bio river). Of these last, only 167,533 were in the three southernmost provinces of Chiloé, Aysen and Magallanes. The net increase in the country's population between 1930 and 1940 was 736,094, or 16·9%.

History.—As the Chilean popular front government of Pres. Pedro Aguirre Cerda entered its third year of power, the Chilean political scene was marked by uncertainties; these continued to dominate the picture throughout 1941. With the formal secession of the Socialists (Jan. 7), after a bitter feud with the communist party, the popular front seemed on the verge of complete collapse. Disregarding possible political effects, Pres. Aguirre vetoed a bill passed by the rightist-controlled congress outlawing the communist party. In the congressional elections of March 2, held under military supervision, the reorganized popular front parties took 71 of the 147 lower house and 19 of the 45 senate seats, while the parties of the right took 61 and 21 seats respectively. Balance of power was thus held by the socialists, with 15 deputies and 5 senators. Among those elected were 17 communist deputies and 4 communist senators (the largest number in Chilean history). The "Popular Socialist Vanguard," formerly the "Chilean nazi party," elected only two, including its leader, Jorge González von Marées. In May, two days before formal opening of the new congress, an organized Vanguardist mob attacked the radical party convention, killing one delegate. Forty-two Vanguardists were arrested, and the government attempted unsuccessfully to place González himself in an insane asylum.

In the new congress, attempts to expel communist members failed by close votes, 71–66 in the chamber of deputies, 20–16 in the senate. Later, after entry of the U.S.S.R. into the war against Hitler, the communist-socialist feud was patched up. Congress's main efforts were directed toward national defense, for which 4,000,000,000 pesos were appropriated. The 1942 budget, 18% more than in 1941, was the largest in the history of Chile. Other legislation included an act for complete control of exports under wartime conditions. Attempts to outlaw naziism and fascism failed of passage in May, as did renewed efforts in August and September.

Cabinet changes were frequent throughout the year. After several months of acrimonious disputes with his own party (the radicals, largest single Chilean political group), Interior Minister Arturo Olavarría, advocate of a rigid neutrality policy, resigned and was succeeded by Dr. Leónidas Guzmán, cancer expert and honorary president of the anti-nazi and fascist league. With the serious illness of Pres. Aguirre in November, Dr. Jerónimo Méndez, little-known president ("national chairman") of the radical party, was named minister of the interior (ranking cabinet position); then, as Pres. Aguirre withdrew temporarily, Méndez became acting president under constitutional procedure. On Pres. Aguirre's death (Nov. 25), Méndez set new presidential elections for Feb. 2, 1942, in conformity with constitutional requirements. The remainder of the year was marked by confused political manoeuvrings and coalition attempts in preparation for the election campaign itself. The principal candidates were Juan Antonio Ríos, a radical with rightist leanings, Oscar Schnake, socialist party leader, regarded by many as perhaps the most capable of all Chilean public figures, Eduardo Cruz Coke, eminent physician and a conservative, with strong personal popularity beyond his own party ranks and General Carlos Ibáñez, former president-dictator (1926–31) and later a consort of nazi and fascist elements.

Especially in the second half of the year, nazi propaganda and other activities were pronounced. After the Vanguardists' obvious failure to attract popular support, Germany, as a good-will gesture, made a gift to Chile of the German training-ship "Priwall," which had been tied up in Valparaiso since 1939. Later, rumours of a nazi-inspired putsch were common, especially after discovery of several secret arms caches in southern Chile (the area of German colonization). Many arrests followed, and an extensive investigation disclosed existence of semi-military organizations said to include up to 200,000 members, chiefly persons of German extraction, with at least 10,000 regular financial contributors, and a plot reputedly co-ordinated with a similar movement in Argentina.

The government's foreign policy was one of rigid, if not blind, neutrality. Co-operation was given to general western hemisphere defense plans, though usually as independent action. Thus, prior to similar United States and other American action, the Chilean government took over three Danish ships on Feb. 16 (and later, two more), on the ground of "public necessity" in view of the acute shortage of shipping facilities. Five German ships, in ports of Chile since 1939, were permitted to escape, however.

A government ban on "all outdoor public meetings and parades in favour of any belligerent country," imposed in June, was followed on Aug. 9 by prohibition of all propaganda by radio. Earlier, in January, formal permission had been granted for public showing of an emasculated edition of the film "The Great Dictator" and subsequently, of the German propaganda film "Victory in the West." In June, however, showing of "Pastor Hall" was forbidden, and on July 9, all "ideological films" were prohibited, although restrictions were modified later.

Several important agreements with other American countries were effected during the year, including trade pacts with Mexico, Brazil and Colombia, and non-aggression treaties with Bolivia and Peru. The latter included an understanding for joint action in coast defense. Chile likewise acted as an arbiter in the Costa Rica-Panama boundary dispute, and began formal diplomatic relations with Canada.

Through most of the year rumours were rife of an impending agreement with the United States for use of Chilean facilities as bases for western hemisphere defense, but without concrete result. Upon formal entry of the United States into World War II, Chile declared her intention to accord that country all non-belligerent rights and belatedly ratified the Havana pacts of July 1940. At the same time, the government took the initiative in calling a general conference of the American republics to meet in Rio de Janeiro in Jan. 1942, and began negotiations with Argentina for modification of the Argentine-Chilean treaty of 1881 under which the Strait of Magellan was demilitarized.

Among the more important internal effects of World War II was an acute shortage of fuels, both oil and coal, which seriously hampered industrial activity. Shortage of shipping facilities gave rise to organized salvaging of wrecked ships in Magellan strait and adjacent waters for ocean service. Prices of some Chilean mineral products were greatly stimulated by heavy Japanese buying during the year. Difficulties in obtaining direly needed imports from the United States caused much irritation, but U.S. action, in December, in rushing a large quantity of stored tin-plate to Chile for use in canning gave promise of a changed policy.

Economically, Chile's problems revolved around foreign trade

and its disruption. The most serious questions were acquisition of new markets and new sources of supply to replace those lost through the spread of war, and maintenance of shipping facilities. On May 8, a foreign trade institute was established "to harmonize commercial relations" with countries with whom Chile had had unfavourable trade balances. Efforts, too, were made to attract new capital to the country. A national development corporation, financed in part through a $22,000,000 credit from the United States Export-Import bank, was set up. Under its direction a public works program of highways, railways, irrigation projects and soil reclamation was launched, and aid was granted for a gold and copper smelter, a mercury recovery plant, a manganese corporation and several other projects.

In keeping with the established policy of state ownership, the government expropriated the properties of the British-owned Nitrate railways, including some 350 mi. of rail lines in the extreme north, with indemnity to be determined later. Following a serious streetcar strike in Santiago in May, negotiations were entered into with the United States corporation owning the property.

Education.—Primary education is free, non-sectarian and compulsory. Official reports for 1939 showed 3,522 government and 1,129 private schools with enrolments of 480,678 and 121,759 respectively; 86 public and 173 private secondary schools with 44,174 students; 151 special schools (including agricultural, vocational, industrial, commercial and normal), with 32,176 pupils. The National university, at Santiago, had 4,774 students, the Catholic university (Santiago), Santa Maria university (Valparaiso) and the University of Concepción together had 1,674. The National university summer session held each January, is a mecca for students from all parts of America.

Defense.—The Chilean army, regarded as one of South America's best, had about 1,500 officers, 20,000 regular troops, 15,000 one-year conscripts and a trained reserve of 200,000 men in 1941. The navy included one battleship (built in 1915), 3 cruisers, 8 destroyers and 9 submarines (the last being the oldest in active service anywhere in the world). An air force of several hundred planes was being greatly augmented under 1941 defense plans. In 1941 the congress made an extraordinary appropriation of 4,000,000,000 pesos (approx. $135,000,000) for national defense.

Finance.—The monetary unit is the peso, valued at approximately 3⅓ cents U.S. The gold peso, used to report foreign trade, was valued at 20.61 cents in 1941. Government revenues for 1940 totalled 2,052,000,000 pesos, expenditures 2,202,000,000 pesos. The 1941 budget was presumed to balance at 2,194,294,000 pesos, but by July 31, aside from extraordinary defense outlays, expenditures exceeded revenues by 154,589,000 pesos. The 1942 budget, an all-time high, provided expenditures of 2,590,836,000 pesos, an 18% increase, with a revenue of 2,419,724,000 pesos.

Communication.—Under normal conditions, Chile has extensive steamship connections with all parts of the world, including direct service under the Chilean flag to New York city, to Guayaquil, and to Argentina, Brazil and Uruguay by way of the Strait of Magellan. Air transport service to all parts of America is provided by Pan American airways and its affiliates, with several flights weekly. Air transport to Europe through Argentina and Brazil was maintained by an Italian line until Dec. 15, 1941, when it was stopped because of lack of gasoline. Rail lines from Arica and Antofagasta connect with Bolivia. The former will eventually form the Pacific end of a transcontinental railway to Santos (Brazil), on the Atlantic; the Antofagasta-Bolivia line is linked directly with the main centres of Chile. Rail-bus service to Argentina is maintained through the Transandine railway route (closed to through rail traffic in 1934) and by way of Bariloche in the south. A 179-mi. international line from Antofagasta to Salta (northwestern Argentina) was being constructed in 1941 at an estimated cost of 73,000,000 pesos.

Internal communication is by rail, coastwise shipping, air and highway. The state-owned railway system extends south to Puerto Montt, with a narrow-gauge line on the island of Chiloé, and in the north (in Tarapacá province) includes the Nitrate railway lines (acquired in 1941). Domestic aviation is well developed under the National Air lines, with routes from one end of the country to the other. The 23,000-mi. highway system includes nearly 10,000 mi. of improved road; although still far from adequate, it is being rapidly extended. The 1941 budget provided 97,000,000 pesos for highways and bridges. The Chilean merchant marine, owned, officered and manned by Chileans, is the best developed in Hispanic America. On June 3, 1941, a government decree prohibited sale or chartering of Chilean ships to foreign interests without government approval.

Foreign Trade.—Imports in 1940 totalled 507,100,000 gold pesos (1939: 410,800,000 pesos), exports 696,700,000 gold pesos (1939: 671,400,000 pesos). The United States supplied 47.9% of all imports (1939: 31.1%), Great Britain 10.4% (1939: 8.3%), Peru 8.4% (1939: 5.1%), Argentina 6.7% (1939: 4.4%), Japan 5.5% (1939: 3.7%), Italy 4% (1939: 3.9%), Germany 3.5% (1939: 22.7%), Brazil 2% (1939: 1.3%). The most important individual products imported in 1940 were petroleum, sugar, cotton cloth and yarn, industrial and office machinery, cattle, coal, benzene, automobiles, laminated iron and steel and wool cloth. Aside from nitrate and iodine purchases (not reported by country of destination, but aggregating 20.2% of all exports in 1940 and 22.5% in 1939), the United States took 58.3% (1939: 30.5%), Great Britain 5.8% (1939: 12.3%), Japan 4.5% (1939: 11.9%), Italy 3% (1939: 3.7%), Argentina 2.7% (1939: 1.9%), France 0.9% (1939: 4.7%). Approximately 45% of all nitrate and iodine exports (20% in 1939) went to the United States, bringing its share of the whole to roughly 68.3%. Mineral products made up 82.9% of all exports (1939: 80%), agricultural 6.3% (1939: 7.8%), animal 4.7% (1939: 6.2%), manufactures, chiefly meats and sugar, 3.2% (1939: 3.3%). Copper alone accounted for 54.6% of all exports (1939: 49.4%), precious metals 7.7% (1939: 6.9%), iron ores 2.1% (1939: 2%). Molybdenum, with no export in 1939, was valued at nearly $600,000 in 1940. The leading agricultural exports were beans, lentils and peas. Wool made up two-thirds of animal product exports, fresh and frozen meats and hides nearly a sixth each.

In the first half of 1941, imports of 228,500,000 pesos value (a 2.7% increase) came chiefly from the United States (54.1%), Great Britain (13.2%), Peru (7.2%), Argentina (6.6%) and Japan (5.1%). Exports, valued at $343,500,000 pesos (a 15.7% decrease), went to the United States (60.8%), Japan (7.5%), Great Britain (5.2%), Argentina (4.1%), aside from nitrate exports of 14.6%, whose destination was undisclosed. Copper made up 58.9% of all exports, other minerals (including nitrates) 23.1%; agricultural and pastoral products 14.4%. Wool comprised 6.3%.

Manufactures.—Manufacturing has, in the past, been confined almost entirely to goods for domestic consumption, especially heavier goods, but provides only a minor part of domestic needs. In 1940 the index of manufacturing stood at 167.2% of the 1927-29 average. Ten leading industries employed 22,093 persons at the end of 1940.

Mineral Production and Agriculture.—The mining industry produces the greater part of all export values, although the proportion varies greatly from year to year. Agriculture, however, is the actual economic backbone of the country. Copper production in 1940 was 352,010 tons (a 3.8% rise); nitrates, 1,428,379 tons (1.2% off); iron, 1,748,418 tons (7.6% advance); coal, 1,937,438 tons (4.7% rise); gold, 10,663 kg., and silver, 47,139 kg. increased 5.5% and 28.3%, respectively. Iodine, 1,294 tons, increased 194.1%. In 1940 an average of 63,181 men were employed in mining, against 61,837 in 1939 and 65,402 in 1938. One-third were employed in nitrates, 30% in copper, 25% in coal. Average employment in the first half of 1941 was 62,333. In that period 147,142 tons of copper, 859,611 of iron, 849,822 of coal and 20,476 kg. of silver were produced. Agricultural production (cereals, fruits, potatoes, vegetables and legumes) is of wide variety, and is mainly consumed within the country. (*See* also HISPANIC AMERICA AND WORLD WAR II.) (L. W. BE.; L. C. DEA.)

China, a republic of eastern Asia with a five-power system of government operating on the basis of Sun Yat-sen's political philosophy. Flag, a red background with a blue sky and a white sun in the upper left corner. Area: 4,480,992 sq.mi.; excluding Manchuria, Outer Mongolia and Tibet proper, 2,903,475 sq.mi.; invaded territories (July 1937–Dec. 1941) more than 500,000 sq.mi.; Free China, about 2,300,000 sq.mi., with a population of approximately 250,000,000. Total population, around 450,000,000. Capital: constitutional, Nanking; wartime, Chungking. Cities with inhabitants of over 100,000 total about 100; Shanghai (1939) 3,848,644; Peiping and Tientsin each more than 1,000,000; Nanking and Canton reduced to less than 1,000,000 as a result of the war; other cities with a population exceeding 500,000: Chungking, Chang-sha, Chengtu and Hankow; other important cities with more than 200,000 population: Kunming, Sian, Kweiyang, Tsingtao and Foochow. Religions and philosophies: Confucianism, Buddhism, Taoism, Lamaism, Christianity and Mohammedanism. President (titular head) Lin Sen; premier (president of the Executive Yuan) Gen. Chiang Kai-shek (*q.v.*).

History.—In the early spring of 1941, Chiang Kai-shek declared that the military crisis in the Sino-Japanese war had definitely passed. The international situation also turned in its favour as China began to receive aid from the United States under the lend-lease program. Following U.S., British and Dutch economic warfare against Japan in the summer, the collaboration between China and the democracies seemed to be closer, and there was some understanding, if not agreement, among the ABCD (American-British-Chinese-Dutch) powers in the Pacific. After Japan's blitz attack on the United States and the British empire Dec. 7, China declared war on Japan, Germany and Italy simultaneously. For China's part in the war, *see* CHINESE-JAPANESE WAR and WORLD WAR II.

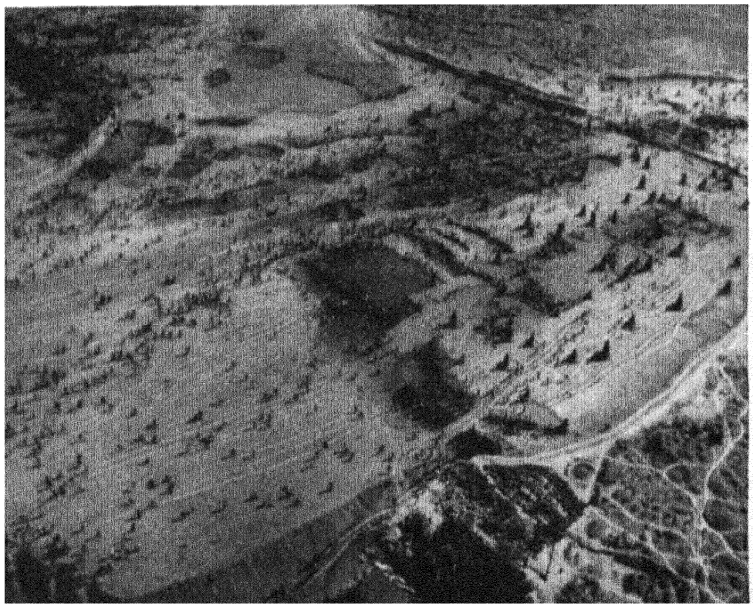
Internally, China's united front suffered a blow early in 1941 when Chungking ordered the new fourth army to be disbanded on the ground of military discipline. However, public opinion at home and abroad, the determination of both the Kuomintang and communists to resist Japan, and the German invasion of the U.S.S.R. checked further friction between the two major parties. Progress in democracy was seen in the strengthening of the People's Political council by increasing its members from 200 to 240,

by enlarging its power and by having 102 of its councillors elective. While the Kuomintang still maintained the constitutional monopoly of power, other minor parties shared more consultative and administrative power than before. Centralization was advanced in the fiscal policy of 1941, to abolish the fiscal prerogatives of the provinces and establish national and county fiscal divisions—thus giving a home-rule system to the county government. National control of economic and social life was also tightened in 1941 by government control of food prices and monopolies on salt, sugar, tobacco and wine and by placing all the social and labour organizations and the Chinese industrial co-operatives under the control and supervision of the ministry of social affairs. In spite of continuously rising prices in food and other commodities, progress was made in all phases of national life in Free China.

Education.—The government spared no effort in saving demolished and damaged universities and in promoting education on all levels, and the estimated national budget for reconstruction, education and cultural affairs increased from 10% to around 19% in 1940. In 1941 there were 113 universities and colleges in comparison with 108 in prewartime. Of these 113 higher educational institutions, 41 were national, 21 provincial and 51 private. The total enrolment was given by the ministry of education as 44,422 in 1940 as against 31,188 in 1937. In 1937 there were 3,264 middle schools in China, of which about one-third were in the occupied areas; at the end of 1940 the number of middle schools in Free China had increased from 1,896 in 1937 to 1,973, while the enrolment had risen from 389,948 to 489,414. Primary education made little progress and the number of primary schools in 21 provinces decreased from 229,911 with 12,847,924 students in 1937 to 212,740 with 12,180,542 students in 1939–40. The five-year program of 1940 aimed to convert the remaining 140,000,000 adult illiterates into intelligent citizens before 1945. In the occupied areas, particularly in north China, the educational system in 1941 showed considerable deterioration quantitatively and qualitatively.

Defense.—The conscription law subjecting all male citizens between 18 and 45 to military service was promulgated in 1933 and revised in 1935, but it was not enforced until after hostilities began in 1937. Because of exemptions and substitutions the system of military service still consisted largely of mercenaries in 1941. The highest figures given by the minister of war put China's army in 1941 at 6,000,000 men under arms, of which 4,000,000 were at the front, and 2,000,000 were in reserve. Communist troops controlling a small portion of Free China were estimated at 750,000. China's army is badly in need of heavy artillery and of tanks, which number only a few hundred. China's small air force is a separate organization under the commission of aeronautical affairs. There has been no Chinese navy since Japan gained control of China's coast. Government expenditures on military forces increased from about 40% of the total outlays before 1937 to about 60% in 1940, but the estimated military budget of 1941 was considerably lower.

Finance.—Japan's invasion impaired China's main sources of revenue. To increase revenue, direct taxes were enlarged and introduced in 1940, and in 1941 the land tax was collected in kind or in cash by the national government instead of by provincial authorities. The actual outlays of 1939 were more than the announced budget of NC$2,859,000,000 for the year. While there was no complete budget published for 1940–41, it is safe to estimate that 1940's expenditures had passed the 5,000,000,000-yuan mark, and, according to unofficial data, the 1941 budget reached 6,000,000,000 yuan. Finance Minister Kung stated in Feb. 1941 that revenues covered only 25% of the expenditure. The bulk of this deficit had to be covered by the issue of notes, bonds and loans. At the end of 1940 the official figures of the note issue by the four government banks was NC$5,800,000,000, but private estimates placed the amount at more than NC$8,000,000,000, and the note issue at the end of 1941 was estimated at more than NC$10,000,000,000. China's dollar (yuan) was worth only around five U.S. cents throughout 1941, and in August the stabilization board, backed by Anglo-American credits of $90,000,000, fixed the exchange rate at $5-11/32 (or NC$18.82 for $1 U.S.) and at £3-3/16. China's gold reserve at the end of 1940 was estimated by the U.S. department of commerce at $100,000,000 exclusive of Anglo-American loans. Eight domestic loans were issued up to 1941, amounting to NC$3,430,000,000, 100,000,000 customs gold units, £20,000,000 and $100,000,000, and the chief foreign loans and credits up to 1941 came from the U.S.S.R., the U.S. and Great Britain, amounting to about $350,000,000, $200,000,000 and £25,000,000 respectively. In 1937 China had 164 banks with 1,627 branches, with approximately NC$400,000,000 paid-up capital, NC$4,500,000,000 in deposits and NC$5,800,000,000 in total resources. From 1937 to 1941 only a few new banks were founded, but more than 60 branches and agencies were established in the interior. There were also about 30 foreign banks in 1941 in China, plus the three banks of the puppet regime.



THOUSANDS OF COOLIES, looking like colonies of ants from the air, laboured in 1941 to fill in airfields for Chinese fighting planes

Trade and Communication.—According to Chinese customs reports, China's foreign trade increased from the 1939 total of NC$2,373,377,000 to NC$4,020,436,000 in 1940; of the latter NC$2,044,365,000 were imports and NC$1,976,071,000 exports, leaving an unfavourable balance of NC$68,294,000. From Jan. to Aug. 1941 imports reached NC$1,721,000,000 and exports, NC$2,018,000,000. Taking Free China alone, the 1940 favourable balance of trade amounted to NC$79,975,000, imports being NC$57,209,000, as against NC$137,184,000 in exports. The principal export articles are silk, tea, wood-oil, bristles, hides, eggs and egg products, tungsten, antimony, tin and handicraft; the principal imports are manufactured goods, machinery, chemical products, war supplies and food. Among the countries and regions importing Chinese goods, the U.S. usually ranked first, followed by Hongkong, Japan, Britain and Germany. After 1938 Japan's exports to China, excluding exports through illegal channels, exceeded that of the U.S., Hongkong, India, England and Germany to China.

All China's railways are single-tracked, with limited carrying capacity, and practically all were owned by the government in 1941. Of the 16 lines of railway totalling more than 10,700 km. in prewartime, 12 were completely lost, and in 1939 the remaining four lines (Chekiang-Kiangsi, portions of Canton-Hankow and Lunghai, and Hunana-Kwangsi) carried some 5,000,000 passengers and more than 1,000,000 tons of freight. Seven new lines of about 2,000 km., including the Yunnan-Burma, were projected in Free China, but less than half were completed by 1941. In north China Japan built, for military purposes, five new lines totalling more than 500 km. By the end of 1939 the length of highways in China totalled 214,430 km., one-fifth of which were surfaced. Free China had 80,000 km. of mostly unsurfaced roads (109,500 km. in the whole country before the war, of which only about 25,000 km. were surfaced). Motor vehicles were as scarce as the paved roads. The airways of the China Aviation corporation maintained 14 lines with a total length of 11,820 km. in 1939. The passengers and freight carried by airways for the year were respectively 27,516 and 236,622 kg. Free China's tele-communications have developed rapidly. The prewar figures of approximately 80,000 km. of telegraph and 23,000 km. of telephone lines were nearly reached in 1941 by the figures for Free China alone. The estimated prewar radio stations and sets amounted to about 60 and 100,000 respectively, and these figures had not greatly changed in 1941.

Agriculture.—China's chief industry is agriculture, which supports more than 70% of its population and contributes no less than 80% to the national income. Three-fourths of the entire population is engaged in farming, but only about 20% of China's land is cultivated and only 29% cultivable. According to investigations of the ministry of economic affairs, out of the entire 7,673,000,000 mou (1 mou=0.6 ac.) of cultivated land, 4,064,000,000 are in the occupied area and 3,607,000,000 in Free China. Ninety percent of the land is for crops and about 1% for pasture. The winter crops are wheat, barley, field peas, broad beans, rape-seed and oats; and summer crops, rice, glutinous rice, kaoliang, millet, corn, soybeans, sweet potatoes, cotton, peanuts, sesamum and tobacco. According to the national agricultural research bureau, the production of both winter and summer crops in the 15 provinces in Free China increased from the 1,592,969,000 piculs (1 picul=133-1/3 lb.) of the prewar 7-year average to 1,723,255,000 in 1939. Because of drought the 1940 production dropped to 1,632,364,000 piculs. In the same 15 provinces the livestock production of 1940 showed a decrease in quantity but a great increase in value.

Manufacturing and Mineral Production.—The industrialization of Free China by government capital and efforts had made rapid progress in 1941. Before 1937 China, excluding Manchuria, had about 2,700 modern factories and nearly half of them, with an annual production valued at about NC$600,000,000, were located in Shanghai. In 1940 there were 1,354 factories in Free China with a total production valued at more than NC$4,000,000,000 at the end of 1940. Before 1937 there were no modern plants for spinning and weaving in the interior, but during the next few years 200,000 spindles were moved into the interior. Excluding Manchuria, the annual prewar production of iron ore and coal in China was below 2,000,000 and 15,000,000 tons respectively. Since 60% of the coal and 85% of the iron reserves are located in the occupied areas, the speed of industrialization in Free China is limited. However, the prospect was encouraging in 1941, as the output of coal increased from 3,600,000 tons in 1937 to 5,700,000 tons in 1940; iron from 31,000 to 100,000 tons; tungsten from about 7,000 to 9,000 tons; antimony from 12,000 to 20,000 tons; tin from 1,000 to 17,000 tons; copper from 400 to 1,000 tons; and petroleum from 34,000 to 440,000 gal. The 1940 total production value of the modern factories, excluding small shops, was given by the ministry of economic affairs as NC$4,693,700,000: textiles took first place (NC$1,763,000,000), chemicals second (NC$1,438,000,000), gold third (NC$280,000,000), followed by electrical appliances and minerals. Because of political difficulties the Chinese industrial co-operatives, which had played an important role in the wartime economy, suffered a setback in 1941 and the monthly production was reduced to below NC$10,000,000. War, disease and the new industry have absorbed most of China's unemployed.

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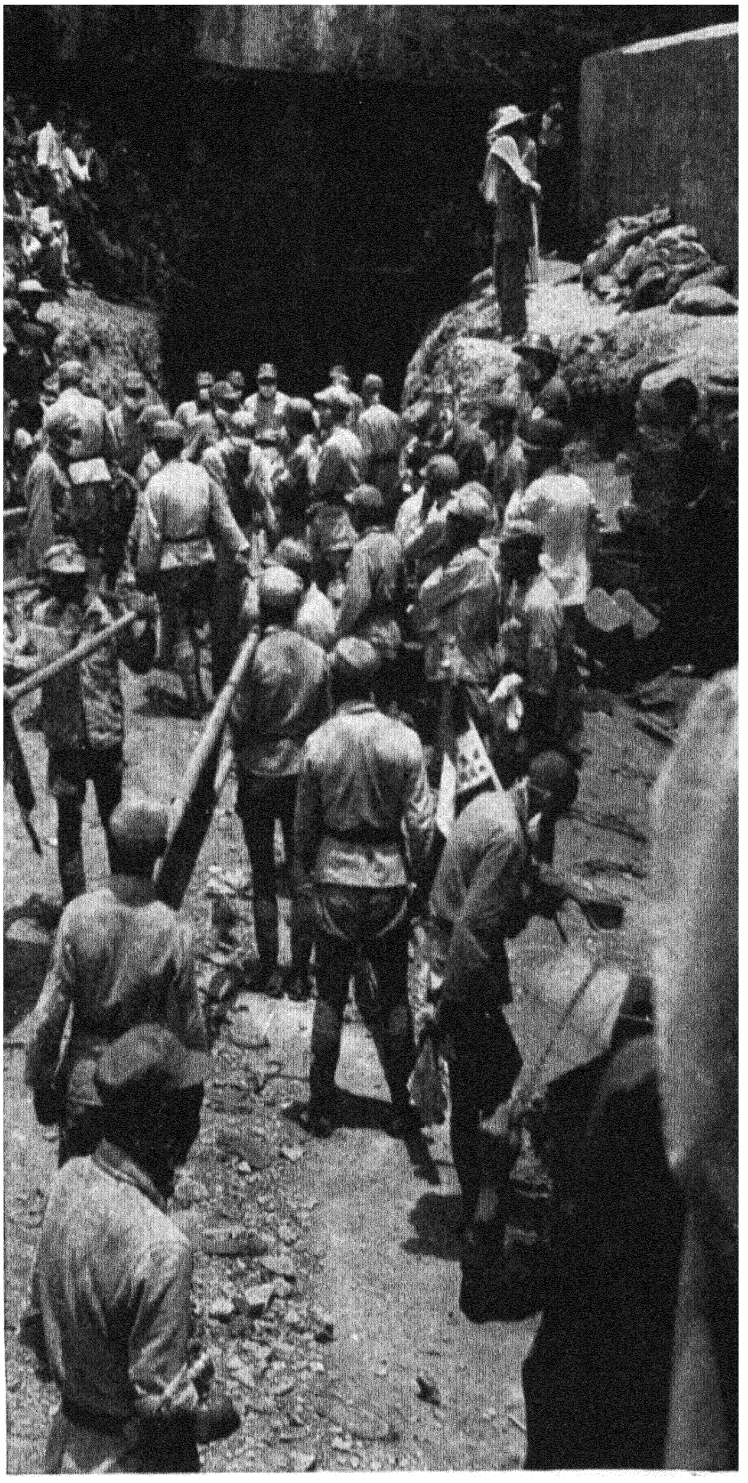
Chinese-Japanese War. In spite of the loss of territories, economic and financial destruction and difficulties, devastating air raids and the drain on human resources China continued its resistance in the fifth year of war, with the hope of a just settlement or an ultimate victory through the influence and assistance of the democracies. The year 1941 brought little change in the stalemate that had persisted since the fall of Hankow in Nov. 1938.

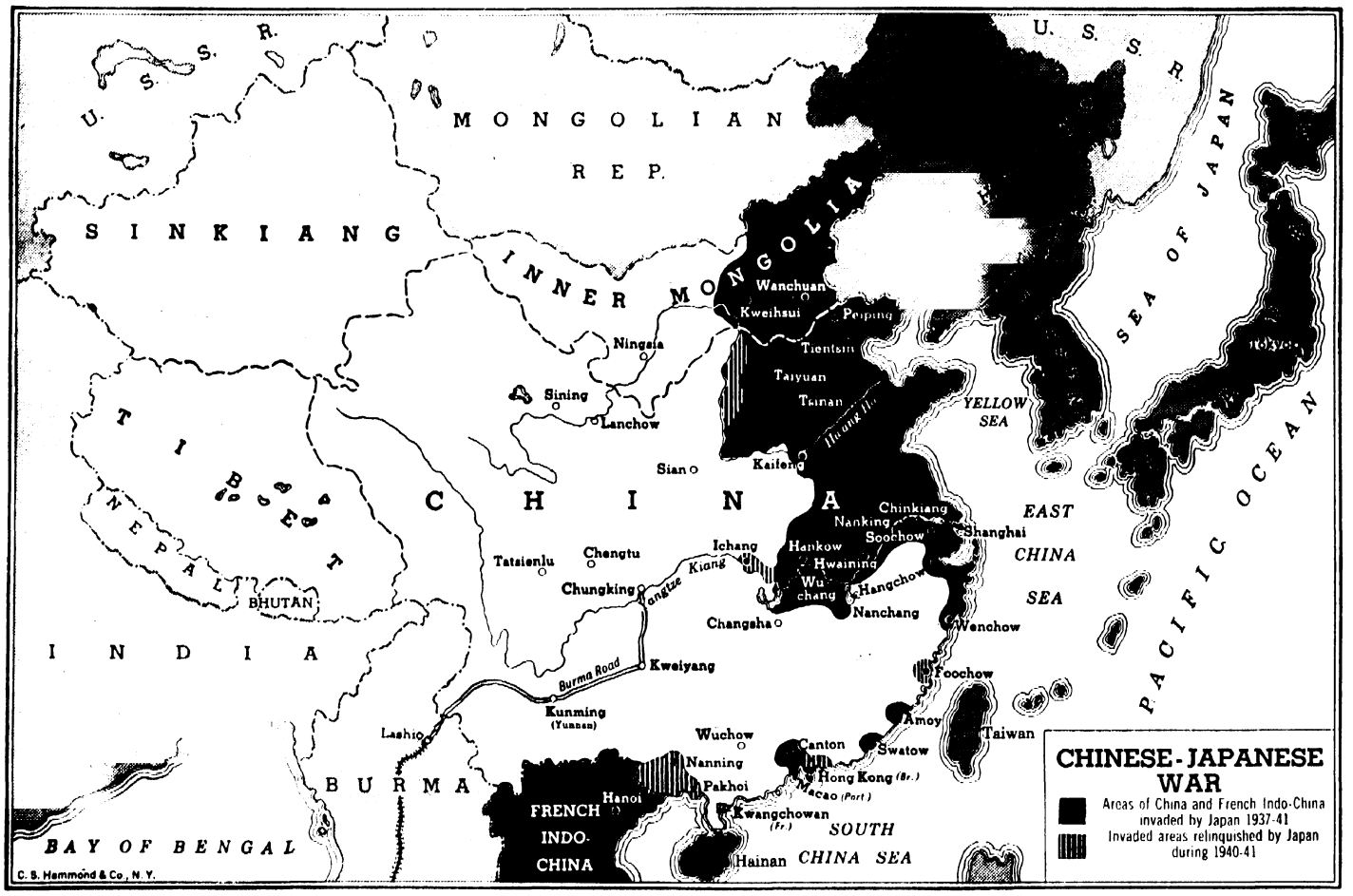
Fighting continued throughout 1941 and Chinese-Japanese objectives, tactics and positions remained unchanged. China's three-stage strategical theory of resistance (defensive in face of offensive, guerrilla warfare and stalemate, and counteroffensive) was matched by Japanese strategy of three periods: the great offensive, military consolidation and pacification. For both China and Japan the military operations of 1941 entered a twilight zone between the second and third stage of warfare; Japan continued to try to destroy or blockade bases of the Chinese government in the west, to stabilize a frontier of conquest, to annihilate China's armies and to exterminate opposition to Japan's political and cultural subjugation, while the Chinese initiated counteroffensive attacks along with widespread guerrilla warfare against the Japanese to prevent them from consolidating. For the sake of convenience the main theatres of war can be divided into three fronts; the northern front, including the five northern provinces; the central front, covering part of Hupeh, Hunan, Kiangsi, Chekiang and Kiang-su; and the southern and coastal front, running through Fukien, Kwangtung and Kwangsi to the Yunnan-Indo-China border. Japanese objectives were to cross the bend of the Yellow river in order to cut China off from communication with Russia, to break through the gorges along Ichang, the gateway to Chungking, and to attack the Burma road from Indo-China. Since its attempt to cross the Yellow river to Cheng-chow from the north had failed, Japan, taking advantage of the clash between the New Fourth army and the central troops, started, in the latter part of Jan. 1941, its "spring offensive" in southern Honan with the strategical 150-mi. section of the Pin-Han railway between Sin-yang and Cheng-chow as an objective. With Sin-yang as a base, Japan, marshalling some 100,000 men, started to push all the way up to Cheng-chow with a secondary southward drive from Kai-feng. Following their pattern of tactics of break-through, encirclement and large flanking movements in order to trap and destroy the Chinese forces, the Japanese made rapid progress in the beginning. As the Japanese forces were scattered and supply lines extended, the Chinese hit back, cutting enemy communications at the same time. In early February the Chinese recovered the lost ground and the Japanese plan was not accomplished in this surprise attack. Having failed in the Honan drive, Japan shifted the offensive to Suiyuan, Hupeh, Shansi, Kiangsi, Chekiang and Kwangtung, and sporadic and minor engagements continued in those regions in February and March. In the Shansi district, Japan undertook an offensive southward in February, attempting to establish a junction between its troops in south Shansi and north Honan but made no headway. In the Ichang sector heavy fighting began early in March, and simultaneously Japanese troops attempted to deal a blow to the Chinese forces concentrated in the vicinity of Shangkao, southwest of Nanchang, so as to remove the threat to Nanchang. The Chinese routed the Japanese there and, according to War Minister Ho, the Kiangsi campaign was a disastrous defeat for Japan.



HUNDREDS OF CITIZENS of Chungking suffocated to death June 5, 1941 when panic broke out in the city's largest air-raid shelter during a Japanese bombing attack. Some observers placed the casualties as high as 4,000

In April Japan attacked southeastern Chekiang and the coast of Fukien in order to cut the remaining munitions routes of China's armies. Around April 20 Japan occupied Ningpo, Hainan, Taichow and Wenchow. On land it drove from Hangchow southward through Shao-hsing to Chu-ki but in May China recovered Chu-ki, Tai-chow and Wenchow.

In February Japan concentrated heavy air, naval and land forces in Canton, Formosa, Hainan and Indo-China. To screen this troop concentration and to cut off the communication routes of China with foreign markets, Japanese troops landed on Feb. 4 on Bias bay. On March 3 Japanese troops under the cover of air and naval fire occupied six different points stretched over a distance of 250 mi. along the Kwangtung coast, and at the same time Japanese warships steamed down to Indo-China to back up the ultimatum to France for acceptance of Japan's Thai-Indo-China peace terms. On March 9, after heavy looting, Japan withdrew from the entire area of the southern Kwangtung coast and the



announcement of withdrawal coincided with the settlement of the Thai-Indo-China dispute in Tokyo. Toward the end of March Japan staged another landing at Kitchioh bay, presumably to cut the remaining coastal routes into free China. In April Japan withdrew from the southeastern part of Kwangtung in face of Chinese reinforcements and attacks. Japan launched the "May offensive" with operations in four areas: Hupeh, Kwangtung, northern Honan and southern Shansi. The objective was to drive the Chinese troops out of north China and close the 150-mi. gap of the Pin-Han railway. Japan used eight divisions, two of which were transferred from south Manchuria. The Chinese forces holding out in Chungtiao mountains were split by the Japanese columns which pushed down from the north. Japan concluded the campaign with some success but the co-ordinated attacks of the Chinese communist forces and central troops checked further Japanese advance. The comparative lull in summer was generally attributed to Japan's indecision as to which way to turn after the outbreak of the German-soviet war. Meanwhile Japan's air force attacked important interior cities and continuously raided Chungking.

On Aug. 25 China started a general offensive on all fronts in central and north China and the Chinese air force reappeared after an absence of many months. The Chinese offensive was regarded as preliminary to a general counteroffensive and was aimed at preventing the withdrawal of Japanese forces for a southward or northward move. The Chinese military authorities claimed that the counterattack was "initiated as a result of an unwritten British-Chinese alliance." It was intended to demonstrate to the United States that China was able to attack and that any U.S. appeasement to Japan would be unwelcome. On Sept. 3 the Chinese recaptured Foochow and forced the Japanese to withdraw from Ningpo and Swatow sections. Partly to convince the United States of Japan's ability to settle the "China incident" so as to prevent further U.S. aid to China, Japan launched in north and central China the "fall offensive," designed as a gigantic pincer against Chungking. Japan's northward drive from Canton, co-ordinated with the Chang-sha campaign to capture the remainder of the Canton-Hankow railway, failed but the battles of Chang-sha, Ichang and Cheng-chow proved to be the fiercest and most important engagements of the year. Japan sent over 100,000 troops into the Chang-sha campaign and on Sept. 18 they began to pour down from their Yo-chow base. To avoid fighting in unfavourable terrain the Chinese offered no real resistance but lured the enemy to the battleground of their choice. The Chinese struck back with vigour on Sept. 29–30 when a small detachment of Japanese entered the northeastern corner of Chang-sha. Realizing they were trapped once more, the Japanese began, on Oct. 1, their retreat which proved to be a "debacle many times worse than 1939" according to the Chinese. Having failed to hold Chang-sha, the Japanese concentrated their drive in Honan, moving southward across the Yellow river with Cheng-chow as their objective. Originally it was intended to coincide with the drive on Chang-sha in a move to close in on Chungking. On Oct. 4 Japanese forces entered Cheng-chow. But after the southern campaign toward Chang-sha collapsed, the Cheng-chow drive lost its strategic significance. On Nov. 1 China recaptured Cheng-chow. Co-ordinate with the counteroffensive on Chang-sha and Cheng-chow, China attacked Ichang and Shasi on Oct. 6. After a fierce four-day hand-to-hand combat the Chinese recaptured Ichang. When the Japanese used gas to attack Ichang, according to Chungking, the Chinese forces withdrew on Oct. 13. The Chinese and Japanese military situation reverted to its original status and Japan's "fall offensive" ended in another major defeat. Toward the end of 1941 Japan continued to concentrate troops north of the Yellow river, attempting a direct drive on Chungking, while forces concentrated in Canton and Indo-China aimed at Yunnan and the Burma road. Until it was safely established in Indo-China and Thailand, Japan

had little chance to attack Yunnan successfully. On Dec. 7 Japan moved into Thailand and attacked Hongkong and other Pacific areas. China switched from defensive to offensive and gathered a large force under the personal command of Chiang Kai-shek to attack the Japanese in the rear in order to relieve the British in Hongkong. China continued to fight as an ally of the western democracies and urged the Allies to form a united command in the war of the Pacific. (*See* WORLD WAR II.)

Political Developments.—Japan's decision to join the axis and to set up Wang's regime as a means to settle the "China incident" barred any possibility of direct negotiation between China and Japan as Chungking declared, toward the end of 1940, that China would make no peace with Japan until the war in Europe came to an end. To resist Japanese aggression to the bitter end has been the public demand and national policy of China to which both the Kuomintang and Communists have subscribed. Neither one would venture to alienate the support and confidence of the large part of the people that belongs to either by starting a civil war. Thus the New Fourth army incident in Jan. 1941 resulted in no open conflict as both Chiang Kai-shek and Chou En-lain, the communist liaison official in Chungking, appealed to unity and pledged to avoid further friction. The soviet international position and Lachlin Currie's and Owen Lattimore's missions to Chiang helped to improve and strengthen China's united front.

To liquidate the "China incident" had been the task of the Japanese government and the inability to settle it had caused the cabinet to change seven times since the beginning of the war. The instability of the government reflected also the long struggle behind the scenes between rival views and forces. To attempt to wield a unitary control over all the factions Konoye created the Imperial Rule Assistance association which faltered in 1941. The anomalous situation arising from the soviet-German war shook the second Konoye cabinet. On July 18 Konoye reorganized the cabinet by dropping Matsuoka and by enlisting half of the cabinet members from the fighting services. The reorganization of the cabinet was followed by Japan's occupation of southern Indo-China. To ease the tension, the third Konoye government solicited an understanding with Washington. As Japanese-American relations showed no sign of improvement, the third Konoye government fell and Gen. Hideki Tojo, with the support of the navy, took over the premiership on Oct. 18; thus the Japanese army emerged from behind the curtain to settle the "China incident." Early in 1941 Japan repeatedly offered peace overtures to Chungking, seeking vainly an amalgamation of Chiang's government with Wang's regime. After Wang's visit to Tokyo in June, Japan made another attempt to strengthen Wang's position militarily, economically and politically by allowing Nanking's armed forces to increase to 500,000 men, by advancing a loan of 300,000,000 yen and by seeking collaboration between Wang and Japan's axis partners in order to enable Wang to carry out his assigned duties: termination of the hostilities, pacification and elimination of foreign interests in the occupied areas. Since Wang's regime failed to attract any influential leaders from Chungking it exerted no influence over the Chinese.

Economic Warfare.—Japan's economic offensive goes hand in hand with the political and military. To control completely China's economic resources and activities and to restrict or suppress non-Japanese foreign business interests in the occupied areas, the Japanese government and big business joined hands: the former controlled the mines, the iron industries, the communications and public utilities and the latter, manufacturing and trade. Everything of industrial importance which could be seized was in Japanese hands; all public utilities were run by them and no important Chinese enterprises remained independent. In 1941 Japan obtained practically all the iron and coal and a great deal of the cotton of the occupied areas in addition to NC$100,000,000 to NC$150,000,000 a month in cash. But the supplies and cash squeezed out of China failed to bring Japan economic relief on a large scale. In order to undermine Chinese national currency and to exterminate the influence of the National government in occupied China the Central Reserve bank was established in Jan. 1941. Like the other two puppet banks it tried to absorb Chinese national currency for the purchase of foreign exchange, to eliminate the circulation of the national currency by enforcing the use of the new notes as legal tender, and to force merchants to buy and sell foreign exchange through the new bank. In spite of the competition of the puppet bank notes, the Japanese yen and unsecured military notes, the national currency in Shanghai and occupied areas remained firm. The America-Britain-China Stabilization board strengthened the value of the national currency by regulating the buying and selling of foreign exchange at a fixed rate. China's dollar became virtually blocked currency. The Allies' blockade of Japan by the freezing of Japanese assets and severing of trade relations thereafter cut off about 75% of its normal imports, resulted in steel and iron shortage, affected Japanese supplies of oil and gasoline and crippled the silk and cotton industry. (*See* also ARMIES OF THE WORLD; CHINA; FOREIGN MISSIONS; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; INTERNATIONAL LAW; JAPAN: *History;* UNITED STATES.)

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(H. T. CH.)

Chinese Turkestan: *see* SIN KIANG.

Chosen (KOREA). A part of the Japanese empire since 1910, Chosen is a peninsula extending southward from the northeastern side of the continent of Asia. It is bounded E. by the Sea of Japan, W. by the Yellow sea and N. by Manchoukuo and the maritime province of Siberia. Area, 85,206 sq.mi., including 1,018 islands; pop. (Dec. 31, 1938) 22,633,751, including 633,320 Japanese and 49,815 other foreigners, mostly Chinese. The capital is Seoul (Keijo), population (1937), 706,396. Other cities: Fusan (213,142); Phyöng-yang (Heijo) (185,419); Taikyû (110,866). Governor general, Gen. Jiro Minami (took office 1936). The country is administered by the government-general, which has seven main administrative offices and two departments: namely, (1) governor general's secretariat and home affairs bureau, (2) financial affairs bureau, (3) industrial bureau, (4) agricultural and forestry bureau, (5) judicial bureau, (6) educational bureau, (7) police bureau, together with the departments of foreign affairs and planning. The governor general convenes an advisory council, consisting of a chairman, a vice-chairman, five advisers and 65 councillors, several times a year.

Education and Religion.—Chosen in 1938 had 5,975 schools, with 1,981,587 students. There was only one university, with 516 students; but there were 9,086 Chosenese students in Japan in 1938. There have been a number of mission schools in Chosen, but their work must have ceased entirely after the outbreak of war between Japan and the United States in Dec. 1941. Some mission schools had already been closed because of disputes with the authorities over the requirement that obeisance be rendered by the students at Shinto shrines. Buddhism, Confucianism and Taoism, all somewhat coloured by the Chosenese national background, are prevalent forms of religion. There were 494,500 Chosenese and 5,800 Japanese Christians in Chosen in 1938.

Finance and Banking.—The unit of currency is the Japanese yen (fixed for several years at the nominal value of 23.48 cents U.S.). The Bank of Chosen issues currency and fulfils other functions of a central banking institution. In 1938 there were nine banks in Chosen, together with branch establishments of three Japanese banks. The amount of currency in circulation was 443,980,609 yen at the end of 1939, and 580,533,508 yen at the end of 1940. Bank deposits were 624,316,000 yen in 1938. The budget for 1940–41 was 837,786,717 yen.

Trade and Communication.—Chosen's exports in 1939 were 1,006,794,000 yen; imports were 1,388,448,000 yen. Exports to Japan were 736,883,000 yen; imports from Japan, 1,229,417,000 yen. There were 4,214.6 km. of government-owned railways in Chosen in 1939, and 1,211.8 km. of privately-owned railways. The length of the network of roads in Chosen at the end of 1938 was 27,731 km. On the same date, there were 1,773 steamers with a tonnage of 110,079, and 14,125 sailing boats with a tonnage of 186,850. There were three airports in 1941 at Seoul, Phyöngyang and Urusan, and a meteorological station at Urusan. The length of telegraph and telephone lines in 1941 was 8,863 km. and 11,115 km.

Agriculture, Manufactures, Minerals.—Chosen is predominantly an agricultural country, with rice as the principal crop. As a result of extended acreage and improved methods of cultivation, the output of rice, on the average, doubled after the annexation of the country to Japan in 1910. A record crop of 120,000,000 bu. was harvested in 1938, but this declined to 70,000,000 bu. as a result of drought in 1939. There were 700,000 head of cattle in Chosen in 1910 and 1,717,062 in 1938. Other agricultural products were barley, wheat, millet, apples, cotton and silk. Precise figures of industrial and mineral production for later years were unavailable in 1941, because the Japanese government ceased to publish such figures for reasons of military strategy. Gold is the most valuable mineral; production of this metal increased fairly rapidly during the '30s, and had reached the figure of 49,909,000 yen in 1936, the last year figures were published. Chosen also contains some iron and coal. The chemical industry took first place among manufactures, with foodstuffs second.

(W. H. CH.)

Christian X (1870–), king of Denmark, K.G., of whom a biographical account will be found in the *Encyclopædia Britannica,* nephew of Queen Alexandra of Great Britain, succeeded his father, Frederick VIII, in 1912. Beloved by his people, and well known for his democratic ways, he continued through 1941 to symbolize the continuity of Danish political institutions, though the German grip on the administration was intensified during the second year of the occupation. Again the king's birthday, his 71st, on Sept. 26 brought evidences of popular loyalty and unity. He continued to live in Amalienborg palace in Copenhagen, though at the very end of the year reports circulated that he was threatening abdication as a protest against new German demands. (*See* also DENMARK.) (F. D. S.)

Christian Science. At the end of 1941, Christian Science wartime activities included eight chaplaincies in the United States Army and seventy-five Camp Welfare Workers. These workers co-operated with chaplains and morale officers, rendering a service like theirs, and maintained

Camp Welfare Rooms at points convenient to camps and military stations at which officers and enlisted men might read, rest, and write letters.

During the year from Oct. 1, 1940, the Christian Science Mother Church (The First Church of Christ, Scientist, in Boston, Mass.) and its branch churches and societies in the United States carried on a remarkable war relief work. During this time, the war relief committees formed by these churches shipped over 700,000 lb. of clothing, worth over $700,000, to Great Britain, where other Christian Science committees distributed the clothing for the benefit of sufferers from the war without regard to their religious faiths. These shipments filled 4,482 crates of standard size. After Oct. 1, 1941, 1,000 more crates of clothing had been shipped to Great Britain by the same committees to be handled in Great Britain in the same way. Of all these shipments, only 25 crates were lost, a loss which amounts to less than one-half of 1% of the total shipments.

In Germany, in Aug. 1941, the Hitler government issued a decree banning Christian Science from German territory and confiscating its property. Presumably this decree registered the complete opposition of National Socialism to religion in general and to Christian Science in particular.

Christian Science is a Christian teaching and practice based directly upon the words and works of Christ Jesus, as distinguished from later creeds and customs. The aim and purpose of the Church of Christ, Scientist, is to "reinstate primitive Christianity and its lost element of healing" (*Church Manual*, p. 17). Christian Science is best known for its healing. Yet, its simple and forthright theology earns and receives increasing comprehension and respect.

At the end of 1941, there were 11,000 practitioners, having cards in *The Christian Science Journal*, who are engaged exclusively in Christian Science healing work. There are also many other practitioners devoting such time as each of them can to the practice of Christian Science, although otherwise employed. (C. P. S.)

Christian Unity. It was characteristic of unity movements in 1941 that, though occurring in widely separated parts of the world, they turned out to be of broad general concern. The notable plan for union in South India of churches of Anglican, Methodist, Presbyterian and Congregational origins under a constitutional episcopate was encouraged by denominations with which these India churches were affiliated in the United States and Great Britain, and was in 1941 apparently very close to accomplishment. The Foreign Missions Conference of the United States declared in June 1941 that the adoption of the South India plan would have far-reaching effects in encouraging similar movements in other lands. In response to an appeal from the "younger churches" of the foreign missions fields, this conference further advised all its member boards to facilitate unions of churches on the respective mission fields and at the same time ask the boards to give practical co-operation to the ideal of unity in their own practices and policies, "so that in the main a unified agency in the west may deal directly with the united churches and with the united administrative organizations in other lands."

In England a proposal for the organization of the United Free church, sponsored by ministers of five leading Protestant denominations, was presented to the Free Church Federal council and referred for further consideration to the constituent churches. Difficulties confronting this far-reaching suggestion were frankly recognized. The same session of the Free Church Federal council considered a report summarizing the replies of the constituent churches to a proposal drafted by a joint commission for reunion of the Free churches with the Church of England. The chief objections voiced related to the sacraments and the ministry.

A North American Ecumenical conference, including limited representation from Central and South America, was held in Toronto, Canada, June 3 to 5, and considered major practical problems confronting the churches of the world. In Dec. 1941, eight of the major national agencies of inter-church co-operation in the United States, including the Federal Council of the Churches of Christ in America together with the corresponding agencies of religious education, home and foreign missions and women's organizations, held a conference of 170 official representatives, which adopted in principle a proposal to combine all these agencies in an inclusive organization and remitted the details of the plan for further study. A merger of the three major organizations of Protestant women into the National Council of Church Women was subsequently effected. Negotiations between the Protestant Episcopal Church and Presbyterian Church in the United States of America developed an "interim" proposal for joint ordination of ministers, which if adopted would give ministers so ordained full recognition by both churches and make them available for pastorates of joint parishes composed of members of both churches and under the jurisdiction of both. The provisional machinery of the World Council of Churches continued to function in spite of increasing difficulty in communication. Six churches became members during the year. One in an occupied country joined secretly. The total membership stood at the close of 1941 at 76 churches in 26 countries. Of 168 "orphan" missions throughout the world cut off by war from their regular sources of support, 117 were aided under a world-wide plan of assistance fostered by the International Missionary council. Similar relief was extended to churches in European countries at war, to refugees and to war prisoners. (*See* also RELIGION.)

(H. P. D.)

Christie, Loring C. (?–1941), Canadian minister to the United States, was born in Amherst, N.S. From 1913 to 1923 he was legal adviser to the department of external affairs in Canada and served as technical adviser to Canadian delegations at many international conferences. An authority on international law and a vigorous advocate of Canadian-United States rapprochement, he took part in the transfer to the U.S. of British bases in the western hemisphere in 1940. He was also active in the negotiations ending in the St. Lawrence waterway agreement. In Sept. 1939 he was appointed minister to the U.S., a post he held until his death in New York city, April 8.

Chromite. Although complete data are lacking, world production of chromite in 1940 was estimated at 1,250,000 metric tons as compared with 1,150,000 tons in 1939. Most of the countries from which 1940 data were received show an improvement in output.

World Production of Chromite

(Metric tons)

	1929	1937	1938	1939	1940
Cuba	53,709	94,592	40,200	67,100	52,900
Greece	24,214	52,000	42,500	55,000?	?
India	50,361	63,300	44,800	?	?
Japan	9,163	?	?	?	?
New Caledonia	52,594	48,022	52,200	52,000	55,800
Philippines	—	69,856	66,900	126,700	194,400
South Africa	63,974	168,600	176,600	150,000	163,600
So. Rhodesia	265,909	275,617	186,000	139,100	300,000?
Turkey	16,178	192,508	213,600	191,600	110,000
U. S. S. R.	52,889	?	?	?	?
Yugoslavia	43,022	59,932	58,500	59,500	?
Total	635,200	1,300,000?	1,050,000?	1,150,000?	1,250,000

Although a material proportion of the war demand of 1917–18 was supplied from domestic mines, there had not been any appreciable effect on United States production after the outbreak of World War II. Increased demand was met by greater imports than ever before; these totalled 657,700 long tons in 1940, as against a previous maximum of 553,900 tons in 1937. In the first eight months of 1941 imports were 548,738 tons, a rate equivalent to 820,000 tons a year. The August total was the largest of the year except for June, and this might make it appear that shipments were being maintained, or even increased, but since the data are imports for consumption, and include not only actual receipts for the month, but also any withdrawals from bonded warehouses, there is no way of knowing whether current receipts were adequate to meet current consumption, or whether a deficit was being made up from stocks previously accumulated. It had been reported, however, that chromite was holding its own about as well as any imported commodity. It is to be noted, however, that with the United States at war with Japan, and with the Philippines an active zone of combat, shipments from that area would probably be stopped, and it was possible that imports from New Caledonia might be interfered with now that the war zone reached that area of the Pacific. (G. A. Ro.)

Chronology: *see* CALENDAR OF EVENTS, 1941, PAGES 1–16.

Churchill, Winston Leonard Spencer

(1874–), British statesman, was born at Blenheim palace, Oxfordshire, England, on Nov. 30, the elder son of Lord Randolph Churchill and Jennie, daughter of Leonard Jerome of New York city. For his biography and his political career during World War I, see *Encyclopædia Britannica.*

The outbreak of war on Sept. 3, 1939, was the occasion for Churchill's re-entry into the cabinet in his old office of first lord of the admiralty. On May 7, 1940, Chamberlain, partly in answer to criticisms of the Norwegian campaign, made him supervisor of day-by-day military operations. Three days later, as the big German drive began and Chamberlain resigned, Churchill became prime minister. The military disasters which followed in rapid succession served to emphasize his qualities of leadership, which had a strong effect in bolstering British morale at one of the gravest moments in the empire's history. On June 4, 1940, after the evacuation of Dunkirk, he promised that Britain would fight on alone, "whatever the cost may be." Churchill's public addresses and reports to parliament as the war progressed were in the main simple and frank statements that did not attempt to disguise the gravity of Britain's danger but invariably pointed up the nation's will to resist.

Throughout the varying fortunes of British arms in 1941, Churchill's personal popularity remained high. Criticism in parliament and in the press was levelled at members of his cabinet rather than at him. On May 7, shortly after the severe defeats in Greece and Libya, he received a 447-to-3 vote of confidence in the house of commons. His conduct of relations with the U.S. was both diplomatic and straightforward, and he did not hesitate to say in his address before the joint session of congress in Washington on Dec. 26 that "if the United States has been found at a disadvantage at various points in the Pacific ocean, we know well that that is to no small extent because of the aid which you have been giving to us in munitions for the defense of the British Isles, and for the Libyan campaign, and above all, because of your help in the battle of the Atlantic." Nor did he hesitate to insert the "due respect for their existing obligations" clause in the Atlantic charter in August. Equally straightforward were his statements regarding the U.S.S.R. and Japan. When Germany invaded the U.S.S.R. June 22, Churchill promised help to the Russians: "Any man or state who fights against naziism will have our aid." Yet at the same time he refused to modify his frequently expressed opposition to communism in its political sphere. Toward Japanese plans for a "new order" in eastern Asia he was adamant. He warned Tokyo on Aug. 24 and again on Nov. 10 that Great Britain would declare war immediately in the event of a Japanese attack on the U.S. This promise he fulfilled Dec. 8. (*See* also GREAT BRITAIN.)

ROOSEVELT AND CHURCHILL after church services aboard the British battleship "Prince of Wales" Aug. 10, 1941, during their historic rendezvous in the Atlantic

Church Membership.

The following figures, taken from the 1941 edition of the *Yearbook of American Churches*, published under the auspices of the Federal Council of Churches of Christ in America, show that about one-half of the population of the United States (slightly over 49%) were reported as church members. Of these, 97.4% were within the 52 religious bodies each having more than 50,000 members; the remaining 2.6% were in 198 smaller bodies.

The "inclusive membership" column in this report gives the official records of the church bodies listed, based on their own reports. The "13 years or over" column is given for use in comparisons and discussions of the relative numerical standing of

the churches reported.

Between 1930 and 1940 the population of the continental United States increased 7·2%; the officially reported church membership increased 7·86%. The 1936 Census of Religious Bodies is incomplete and unsatisfactory for some denominations, on account of the refusal of many ministers in these denominations to co-operate. The main differences are in the figures for the Southern Baptist Convention, the Methodist Episcopal and the Methodist Episcopal South, which reported only 43,618 churches to the 1936 census, while their own official statistics for the same year report 65,267 churches. An analysis of the causes of this non-co-operation is found in the 1941 *Yearbook of American Churches* pp. 139–41. (*See* also CHRISTIAN UNITY.)

Church Membership in the United States in 1940*

Body	*Churches*	*Inclusive Membership*	*13 Years or Over*
African M. E.	7,115	650,000	581,750
African M. E. Zion	2,252	414,244	332,376
American Baptist Association	1,064	115,022	93,955
American Lutheran	2,028	560,940	393,807
Assemblies of God	3,030	198,834	198,834
Augustana Lutheran	1,189	340,171	258,500
Brethren (Dunkers)	1,017	176,908	163,133
Christian Reformed	298	121,755	80,358
Churches of Christ	3,815	309,551	309,551
Church of Christ, Scientist	2,113	268,915	268,915
Church of God (Anderson, Ind.)	1,428	74,497	62,727
Church of God (Cleveland, Tenn.)	1,602	63,216	61,320
Church of Jesus Christ of Latter-Day Saints	1,499	724,401	512,028
Church of Jesus Christ of Latter-Day Saints (Reorganized)	570	106,554	98,700
Church of Nazarene	2,612	165,532	154,607
Colored M. E.	4,000	365,000	315,000
Congregational Christian	6,041	1,049,575	1,022,287
Cumberland Presbyterian	1,082	73,357	62,353
Disciples of Christ	7,974	1,658,966	1,537,862
Evangelical	2,010	244,278	232,065
Evangelical and Reformed	2,861	658,571	591,455
Free Will Baptist	1,102	118,871	117,130
Friends (Orthodox)	600	68,000	55,750
Mennonite	495	51,304	49,663
Methodist	42,139	7,377,487	6,706,136
Missouri Lutheran	4,205	1,277,097	912,720
National Baptist Convention	24,575	4,046,840	3,654,501
National Baptist Ev. Assembly	176	55,897	49,749
Northern Baptist	7,478	1,543,976	1,403,689
Norwegian Lutheran	2,526	536,073	370,962
Presbyterian, U.S. (South)	3,487	532,135	494,886
Presbyterian, U.S.A.	8,619	1,971,304	1,892,510
Primitive Baptist	1,726	69,157	68,881
Protestant Episcopal	7,074	1,996,434	1,420,171
Reformed Church in America	723	163,135	153,510
Salvation Army	1,647	238,357	104,876
Seventh Day Adventists	2,565	176,218	171,518
Southern Baptist	25,018	4,949,174	4,662,122
Unitarian	380	63,745	63,745
United Brethren	2,809	421,689	377,388
United Lutheran	3,750	1,611,778	1,192,716
United Presbyterian	853	187,470	180,622
Universalist	508	51,489	50,408
Wisconsin Lutheran	807	256,007	177,402
Totals	199,644	36,040,618	31,674,726
Eastern Orthodox Churches	809	735,440	553,356
Jewish Congregations	3,728	4,641,184	3,341,652
Old Catholic Churches	93	25,909	20,803
Polish National Catholic	118	63,366	47,921
Roman Catholic	18,733	21,284,455	15,252,639
198 Smaller Religious Bodies	21,194	1,710,622	1,514,562
Totals	244,319	64,501,594	52,405,650

*Continental United States only.

(L. A. We.)

Church of England. In the history of the Church of England, as in secular history, the year 1941 will be marked by sinister memories. But the record is not all one of loss. Against the bombing of Lambeth palace, of several cathedrals and of more than 1,000 churches, church halls and schools, with the death or mutilation of many clergy and lay folk doing voluntary fire-watching, must be set several portents of hope. There were countless cases of individual heroism and a national mood of ready self-sacrifice. There was a growing realization of the importance of religious education and a movement, in which all the Christian churches co-operated, to secure it in all schools. Last but not least, there were renewed signs of a growing national revival of religion.

Of the damage disclosed during the year (some of which occurred before the close of 1940) special mention must be made of the heavy bombing of the new Church House, Westminster, just completed as a centre for the whole of the world-wide Anglican communion; and of some important missionary and diocesan offices. The great new cathedral at Liverpool had a narrow escape when a bomb passed through the outer roof of a transept, but was happily deflected before the full force of the explosion could take effect.

Of many practical steps taken, the more important included the launching in February of the War Damage Central Relief fund; and the passing by the Church assembly of a measure setting up in every diocese a reorganization committee with far-reaching powers to carry out postwar reconstruction and rationalization, including the closing of redundant churches and the use of war damage compensation to rebuild to the best advantage in view of the movements of population and industry. The Central Council for the Care of Churches made provision for the emergency storage of valuables and pressed forward a national photographic survey of all churches, so that there might be available complete photographic records of churches making possible accurate restoration after bombing.

Effective work was done by two special committees in supplementing that of the chaplains in promoting religious education among men and women in His Majesty's forces. The church suffered a great loss by the death of Dr. F. Partridge, bishop of Portsmouth, the great financial genius and organizer behind most of the major financial developments since 1918. Episcopal resignations were Dr. H. E. Bilbrough, bishop of Newcastle, Dr. C. Lisle Carr, bishop of Hereford, Dr. H. Mosley, bishop of Southwell, and Dr. A. W. T. Perowne, bishop of Worcester; Bishop Noel Hudson, general secretary of the S.P.G., Dr. R. G. Parsons, bishop of Southwark, Canon F. R. Barry and Prebendary W. W. Cash, general secretary of the C.M.S., were respectively appointed to these sees.

Turning to the wider field of the Anglican communion as a whole, deep gratitude was expressed to the American Episcopal Church for a generous gift of $300,000 to help the foreign missions of the Church of England; there were momentous changes in the Nippon Seikokwai (Japan Holy Catholic church), where all foreign bishops resigned and a purely Japanese episcopate took over. In September was celebrated the centenary of the bishopric in Jerusalem. The see of Gibraltar, which stretches from the Atlantic to the Persian frontier, endured heavy trials and difficulties.

(Ro. Sto.)

Church Reunion: *see* CHRISTIAN UNITY; RELIGION.
Cigars and Cigarettes: *see* TOBACCO.
Cinema Industry: *see* MOTION PICTURES.
C.I.O.: *see* CONGRESS OF INDUSTRIAL ORGANIZATIONS.
Citrus Fruits: *see* GRAPEFRUIT; LEMONS AND LIMES; ORANGES.
City Government: *see* MUNICIPAL GOVERNMENT.

Civilian Conservation Corps. The training of young men in good work habits and in national defense skills plus the advancement of a nation-wide conservation program represented the outstanding activities of the Civilian Conservation Corps during the 1941 calendar year.

Although the number of applicants for enrolment in the corps continued to be large, the high rate of turnover in the camps brought the average enrollee strength for the year well below any previous 12-month period since the corps was established in 1933. The high rate of turnover was due to the large demand on the part of industry for trained workers together with the fact that young men could obtain jobs with less training than had been the case for many years. Corps records showed that 322,000 men were enrolled in the CCC during the 1941 fiscal year and that a total of 550,000 men were in the corps at one time or another during the year.

The young men enrolled in the CCC camps received training while at work on the various types of conservation projects carried on during the year. They also had an opportunity to supplement the training on the job by attending classes or working in shops in the evening. About 40,000 men attended special national defense training courses financed by funds

voted for national defense training.

A new type of activity—work on army, navy and marine corps reservations—was carried forward with increasing scope during the year. At its close, 81 companies had been assigned to this type of work. It involved land clearance, logging and lumbering operations, construction of roads, bridges, telephone lines, airfields, manoeuvre and drill fields, target ranges, utilities systems and buildings, forest protection, mosquito control, landscaping and emergency work. The other CCC companies continued regular conservation operations in forests, parks and wild-life refuges and on farm lands and grazing and reclamation areas. Work projects of about two-thirds of the camps were under the supervision of the department of agriculture and the remaining one-third under the department of the interior.

The demand for CCC-trained men by national defense industries resulted from the all-round program offered in the corps. This included work experience, inculcation of industrial safety practices, development of special skills through the work program, special schools and vocational classes, and physical conditioning. Personnel managers of many large companies gave preference to CCC men, because they knew the men were trained in proper work habits and physically fit to handle a job.

In the conservation field, the CCC planted 2,246,100,600 forest trees since it was established in April 1933. It built 122,168 mi. of truck trails and minor roads, 85,548 mi. of telephone lines, 45,382 bridges, 5,875,578 check dams and 7,073 impounding and large diversion dams. By 1941 it had reduced fire hazards on 2,116,620 ac. of forest lands, spent 6,182,269 man-days in fire prevention and fire presuppression work and 6,304,211 man-days in fighting forest fires. The corps cleaned, developed or built, by 1941, 23,725 springs, wells, water holes and small reservoirs, principally in the western grazing country. It built 82,400 mi. of three-strand fence, enough to reach around the borders of the United States four and one-half times.

The appropriation for the Civilian Conservation corps for the fiscal year ending June 30, 1942, was $246,960,000. Due to the reduction in the number of camps operating, a substantial portion of this sum was expected to be returned to the treasury.

James J. McEntee, a native of New Jersey, was director of the Civilian Conservation corps in 1941. He was charged with the co-ordination of its operations through the war department, which handles camp administration, the departments of the interior and agriculture, which supervise the work projects, and the veterans administration, which selects war veterans who make up approximately 10% of the corps. The office of the director, CCC, is located at 810 18th street, N.W., Washington, D.C. (*See* also VETERANS ADMINISTRATION.) (J. J. McE.)

Civilian Defense, Office of. This office was established as a division of the Office for Emergency Management by executive order on May 20, 1941. Its stated duties and objectives included the co-ordination of federal, state and local civilian defense relationships, planning and execution of programs for the protection of civilian life and property in event of emergency and establishment of opportunities for the training of volunteers in the interests of defense.

The office is headed by the U.S. director of civilian defense who is aided by two advisory bodies: the Board for Civilian Protection and the Volunteer Participation committee. Under the director are nine regional directors whose areas are coterminous with those of the war department corps areas. The regional directors are in direct contact with the state governors and their defense councils which, in turn, are in contact, through state co-ordinators, with city mayors and local co-ordinators. Local co-ordinators, with the aid of their civilian defense committees, are in direct control of the various volunteer units. The latter usually consist of divisions comprising air-raid wardens, emergency fire fighters, auxiliary police, medical and first aid workers, public works and utilities aids, demolition squadrons and public relations workers, as well as volunteers in numerous other vital services. Participation in local units is voluntary, but persons accepting responsibility are obligated to perform their respective duties.

For the purpose of working with states and municipalities, the Division of State and Local Co-operation, which had been created by the advisory commission to the Council of National Defense in Aug. 1940, was embodied in the Office of Civilian Defense. However, state and local defense councils which had been established on the recommendation of the division were not supplanted by the Office of Civilian Defense.

The scope of the civilian defense program is indicated by some of its major activities. Included in civilian protection are divisions for: instruction to the public as to air-raid defense, communication of air-raid warnings, a well trained air-raid warden service, first-aid parties to care for casualties, first-aid posts, casualty clearing stations, ambulance corps, clearance of debris in streets and highways, demolition of unsafe and partially wrecked buildings, rescue of persons trapped in buildings, repair of public utilities such as gas and water mains and wire conduits, detection of poison gas and decontamination of gas areas, provision for housing air-raid defense services, construction of air-raid shelters where necessary, control of light services, evacuation and control of traffic during emergencies, co-ordination of all air-raid defense services, formation of fire and police auxiliary forces, extinguishing incendiary bombs, acquisition of equipment as well as transportation and provision of food and help for air-raid wardens during periods of sustained service. In many instances such service units are under the supervision of local governmental departments; for example, training and supervision of fire auxiliaries is handled by the fire departments, that of police auxiliaries by the police departments. In other instances, however, where duties do not coincide with those of established local departments, personnel is trained in special classes established for the purpose. Foremost among the latter is that of air-raid wardens.

Local civilian defense warden systems differ somewhat in organization, depending upon the size and location of the community. A typical city with a population of 65,000 has a single co-ordinator appointed by the local defense council. Under this co-ordinator is a chief warden for each city ward. Subordinate to them are numerous section wardens, each having a jurisdictional area composed of about 250 families. Reporting to such section wardens are a number of block wardens, at least one for each city block. Heavily populated areas, such as hotel and apartment house districts, have additional unit wardens for each major portion of a building. Under such systems, generally known as block warden systems, every family in the city can theoretically be contacted in case of emergency within a short time, usually less than an hour, even though usual communications be disrupted.

At the end of 1941, about 6,000 local defense councils had been organized throughout the United States. Region 1, comprising the New England states, had the most; and region 8, constituting the southwest states, was next in order. Texas, with about 900 local councils, had the most of any single state. About 1,000,000 persons had been trained, were in training or enrolled in civilian defense activities by the end of the year. The most popular service was that of air-raid wardens with an enrolment of nearly 250,000. Next in order were auxiliary firemen, 112,000; driver's corps, 64,000; food and housing corps, 55,000; and auxiliary police, 50,000. Twenty-seven states had legislation recognizing the state defense councils and defining their responsibilities. The other 21 state councils were functioning under executive orders or appointments from their governors. Two states, Georgia and Wisconsin, utilized their state planning boards.

Director of the Office of Civilian Defense during 1941 was Fiorello H. LaGuardia. Following his retirement after the close of the year, he was succeeded by James M. Landis. Assistant director during 1941 was Mrs. Franklin D. Roosevelt. (*See* also MUNICIPAL GOVERNMENT; MUNITIONS OF WAR: *Air Bombing.*) (X)

Civilian Defense.—*Great Britain.*—The beginning of 1941 saw Great Britain in the midst of a period of heavy night raiding. The continuous raids on London had given place to attacks on certain of the big provincial cities; attacks which were to continue for some time and which switched back to London from time to time.

In order to appreciate the civil defense position at the end of 1941, it is important that the original basis of the organization is remembered; and, also, the new factors which night

WHAT TO DO IN AN AIR RAID

1. KEEP COOL

Above all, keep cool. Don't lose your head.

Do not crowd the streets; avoid chaos, prevent disorder and havoc.

You can fool the enemy. It is easy. If planes come over stay where you are. Don't phone unnecessarily. The chance you will be hit is small. It is part of the risk we must take to win this war.

Until an alarm, go about your usual business and recreation in the ordinary way.

Think *twice* before you do anything. Don't believe *rumors*—spreading false rumors is part of the enemy's technique. Don't let him take you in.

Know your air-raid warning. In general, it is short blasts or rising and falling pitch, on whistles or horns. The "all clear" is a steady tone for 2 minutes. *Watch this paper for description of the local signal.* (This is subject to change.)

Await *official* information before taking any action. When the Air Raid Warden comes to your home, do what he tells you. He is for your protection. He is your friend.

He will help you do your part to whip the enemy.

We can do it. We *will* do it, if we stay calm and cool and strong and alert.

2. STAY HOME

The safest place in an air raid is at home.

If you are away from home, get under cover in the nearest shelter. Avoid crowded places. Stay off the streets.

The enemy wants you to run out into the streets, create a mob, start a panic. *Don't do it!*

If incendiary bombs fall, play a *spray* from a garden hose (never a splash or stream) of water on the bomb. Switch to a stream to put out any fire started by the bomb. Switch back to a spray for the bomb. The bomb will burn for about 15 minutes if left alone, only about 2 minutes under a fine water spray. *A jet splash, stream or bucket of water will make it explode.*

Under raid conditions, keep a bathtub and buckets full of water for the use of the fire department in case water mains are broken.

If you have a soda-and-acid extinguisher (the kind you turn upside down), use it with your finger over the nozzle to make a spray. Don't use the chemical kind (small cylinders of liquid) on bombs. It is all right for ordinary fires.

But above all, keep cool, stay home.

Choose one member of the family to be the home air-warden—who will remember all the rules and what to do. Mother makes the best.

3. PUT OUT LIGHTS

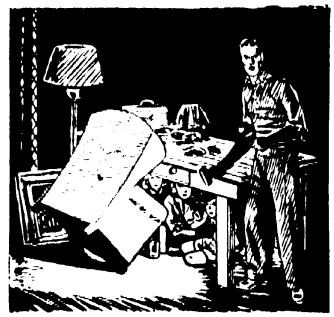
Whether or not black-out is ordered, don't show more light than is necessary. If planes come over, put out or cover all lights at once—don't wait for the black-out order. The light that can't be seen will never guide a Jap. Remember a candle light may be seen for miles from the air.

If you have portieres or curtains, arrange a double thickness over your windows. Blankets will do. If you have heavy black paper, paste it on your windows. Don't crowd or stampede stores to get it, however. You probably have everything you need at home. Be ingenious—improvise.

Should you get an air-raid warning, remember to shut off gas stoves, gas furnaces, and gas pilot lights on both. Bomb explosions may blow them out from blast effect. Gas that collects may be explosive later.

Prepare one room, the one with the least window glass, in the strongest part of your house, for a refuge room. Put food and drinking water in it. Put a sturdy table in it. Put mattresses and chairs in it. Take a magazine or two, and a deck of cards, into it. Take things like eyeglasses and dentures with you when you go into it. Take toilet facilities, paper, a screen. If you have a portable radio, take that too. Above all, *keep calm. Stay at home. Put out lights.*

4. LIE DOWN



If bombs start to fall near you, lie down. You will feel the blast least that way, escape fragments or splinters.

The safest place is under a good stout table—the stronger the legs the better.

A mattress under a table combines comfort with safety.

The enemy may use explosive bombs or incendiary bombs, or both. If incendiaries are used, it's more important to deal with them than to be safe from blast. So defeat the incendiary with a *spray* (never a splash or stream) of water, then go back to safety under a table in a refuge room.

Most raids will likely be over *in your immediate neighborhood* in a short time. However, stay under cover till the "all clear" is sounded.

Know your raid alarms. Know the all clear. Official news of these will come to you from your Air Raid Warden. Don't believe rumors. Watch this paper for air raid alarm description. Ask the warden when he comes.

Should your house be hit, keep cool. Answer tappings from rescue crews if you are trapped. (You most likely won't be either hit or trapped, but if you are, you can depend on rescue squads to go after you.) Again—keep cool, and wait. Don't yell after you hear them coming to you, unless they tell you to. *Keep cool!*

Just keeping cool hurts the enemy more than anything else you can do. *Keep calm. Stay at home. Put out lights. Lie down.*

5. STAY AWAY FROM WINDOWS

Glass shatters easily, so stay away from windows.

Don't go to windows and look out, in an air raid. It is a dangerous thing, and helps the enemy. The Air Raid Warden is out there watching for you. Again we say, get off the street if planes come over.

At night, there is danger of being caught in blast from explosives.

Antiaircraft fire means falling shrapnel. You are safe from it indoors, away from windows. It's more important to shell a plane than it is to see it from a window. Do not say—we are repeating; we would rather repeat until we bore you than have you forget.

Stay in your refuge room, away from windows. That is the safest place. Go there at the first alarm; stay there until the all clear.

Above all, *keep calm. Stay home. Put out lights. Lie down. Stay away from windows.*

You can do all those things without any special equipment, other than what you have now in your home.

You can help lick the Japs, with your bare hands, if you will do just those few, simple things.

Be a good fellow and follow instructions and keep well.

Do not be a wise guy and get hurt.

6. YOU CAN HELP

Strong, capable, calm people are needed to man the volunteer services. If you want to help, there are lots of opportunities.

If you know first aid, and have a certificate, there is an immediate job for you. If you are a veteran, or a former volunteer or regular fireman, or policeman, there is work for you. If you have no special skills but are strong and husky, there is a job for you in rescue squads, road-repair units, or demolition and clearance squads. If you have and can drive a car, you may be needed for drivers' corps. Older Boy and Girl Scouts over 15 can help as messengers. Both men and women are needed.

Here's how to get started:

If there's a Civilian Defense Volunteer Office in your community, call there and ask where to report. If not, call your local Defense Council or Committee, or the Chamber of Commerce. Phone and ask where to report, rather than going in person.

PRIMARY LESSONS in self-protection during air raids, as pointed out in a pamphlet issued in Dec. 1941 by the U.S. Office of Civilian Defense. The pamphlet is illustrated by Milton Caniff, creator of the comic strip "Terry and the Pirates."

bombing on a continuous and heavy scale were to introduce.

The civil defense organization, or A.R.P., as it was then called, was designed to meet heavy, although not prolonged day and night raids by hostile aircraft based on German territory. Furthermore, it was anticipated that such raids would, in the main, be most effective in the eastern half of Great Britain, although with the increasing range of aircraft it was realized that no part of the country could be considered to be immune from such attacks.

The occupation of Norway, Denmark, the Low Countries and France brought about a very radical change, however, in the strategical dispositions of the *Luftwaffe*; and consequently in the relative vulnerability of the different parts of the country and the weight of attack to which it might be subjected. It was also possible for the enemy air force to increase greatly the duration of their attacks.

The problem of invasion assumed an entirely new complexion and was not without its repercussions on civil defense.

Finally when the "battle of Britain" was fought and the royal air force emerged triumphant the enemy was forced into concentrating his efforts into the hours of darkness which again had an important bearing on the civil defense organization.

It was, then, against this background, without actual experience and faced with a far greater peril than had been envisaged, that the civil defense organization went into action. And by the beginning of 1941, the new problems which German strategy had produced were rapidly becoming clear. In the main they showed: that the organization to deal with the needs of the community after a heavy raid required greatly to be expanded; that the menace of fire was great and that the organization to deal with incendiary bombs before they had time to start large fires had also to be largely extended; how important it was for shelters in target areas to be provided with proper sleeping facilities, including sanitary conveniences, heating, and, in larger shelters, first-aid posts; the heavy burden on rescue parties and the extent to which the government had to supplement local resources.

By the end of the year, and with the relief from heavy night raiding resulting from the concentration of German effort against Russia, great strides had been made.

The pivot of civil defense is the ministry of home security. And, although departmentally its main responsibility is for the administration and operation of civil defense services, a responsibility shared with the ministry of health and department of health for Scotland as regards the casualty services, it deals also with other precautions against air attack; *e.g.*, lighting restrictions, experimental work and erection of shelters.

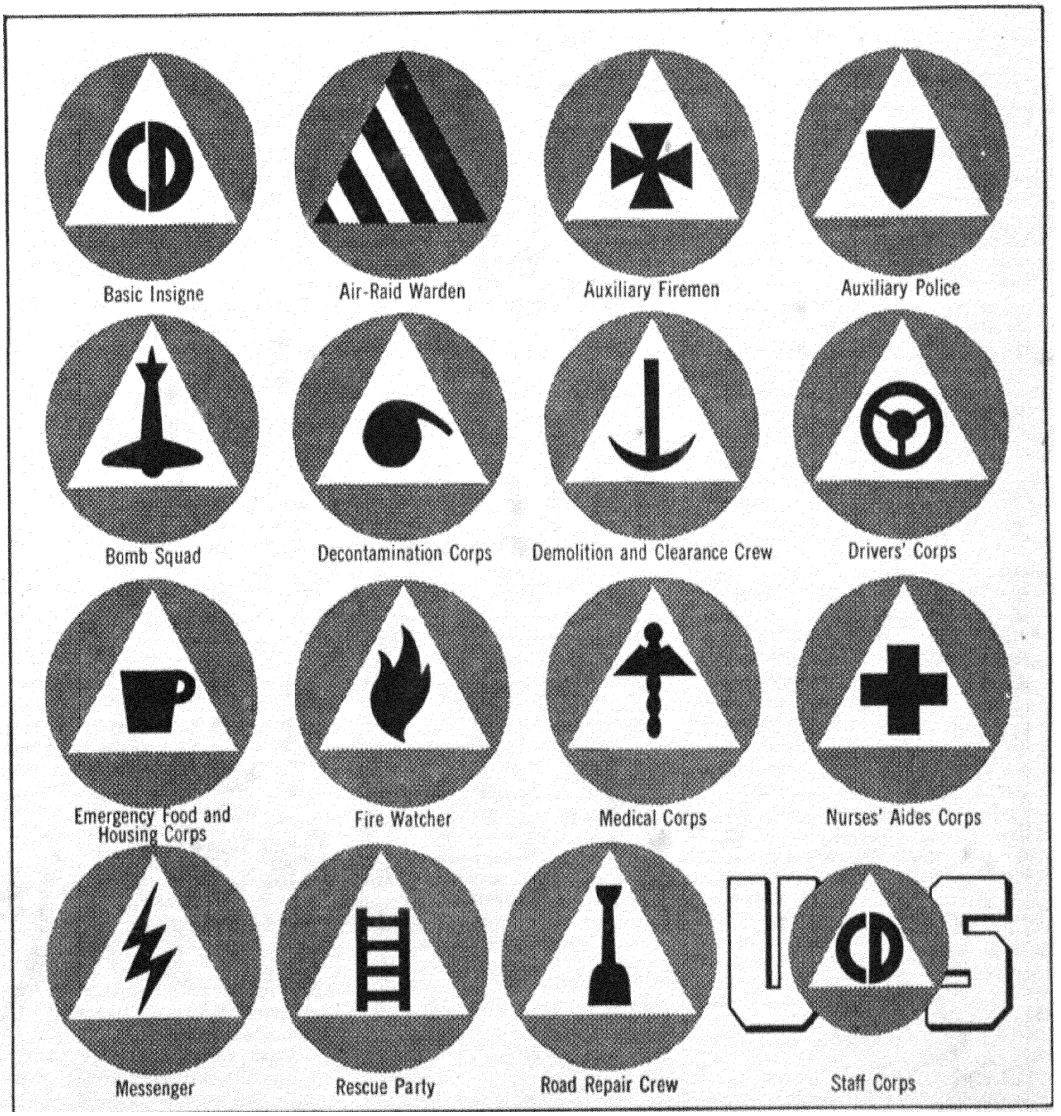
The minister exercises, moreover, a co-ordinating function over other ministries whose activities deal in one way or another with the restoration of the situation after heavy attack. In fact the battle has come to be regarded in two distinct phases: operations to save life and property during the attack and the restoration of the life of the community after the attack has ceased. The first phase concerns particularly the ministries of home security and health; the latter a wide range of ministries, including again the ministry of health for such matters as evacuation, billeting, rehousing, rest centres, eating supplies and first-aid repairs to buildings, with the department of health for Scotland carrying out similar functions north of the Tweed, the ministry of war transport for shipping, docks, railways, roads and electricity, the ministry of food, the ministry of works and buildings for supply of materials and allocation of labour for repairs needed as the result of raids.

In addition, the service ministries are responsible for adequate passive air defense measures in all factories, arsenals and similar establishments coming under their control; and the ministry of labour for all other factories.

The necessary co-ordination of all these diverse activities is effected by means of ministerial and departmental committees.

England has been divided up into 12 regions of convenient size, each operating under a regional commissioner who works directly under the minister of home security. The regional commissioners have their headquarters at a convenient centre in their region. Scotland is subdivided into five districts, each in charge of a district commissioner working direct to the regional commissioner in Edinburgh. Wales has two joint commissioners, one of whom is located permanently in north Wales, while London has three commissioners and is divided into groups, each comprising a convenient number of local authorities and having a group co-ordinating officer with a small staff working direct to regional headquarters. London has also a special commissioner for the homeless and another for clearance of debris and the supply of labour for after-raid work.

Regional commissioners have normally two deputies, a principal officer and a considerable staff to deal with administration, inspections and technical matters. Although under normal conditions they work direct to their own ministries, there are a number of regional representatives of the other departments concerned in civil defense. They work in close touch with the regional commissioner who has also a co-ordinating responsibility:



INSIGNIA worn by U.S. civilian defense workers

CIVILIAN VOLUNTEERS rehearsing in 1941 at the information centre of the U.S. army air defense board in New York city. As operators, informed by observers, locate the attacking planes on the map, officers in the booth above telephone instructions to anti-aircraft batteries and interceptor planes

under certain circumstances these representatives would act directly under the commissioner's orders. Every commissioner has also a military and R.A.F. liaison staff.

Under the regional commissioners work the local authorities, who are divided into two broad categories: scheme making and nonscheme making. It is the former who work direct to the commissioners. The remainder of so-called nonscheme-making authorities are administered direct by the county councils, although the councils do in practice delegate responsibility. In addition there are certain matters on which the smaller local authorities have specific responsibilities and work direct to the regional commissioner; *e.g.*, fire prevention, first-aid repairs to houses.

All local authorities down to rural district councils have a civil defense organization varying in strength according to their size, population and estimated vulnerability.

All scheme-making authorities and important nonscheme-making authorities have a controller, who is responsible for the operation of the civil defense services; and an emergency committee, normally composed of three or four members of the local council, to whom have been delegated wide powers by the authority to act on its behalf on matters of civil defense. They are also responsible for co-ordinating all the arrangements for the restoration of the situation after a heavy raid, although for this purpose additional members are often co-opted to cover the wide range of the problem.

The chief civil defense services working under the controller are the wardens, rescue, decontamination, first aid, ambulances, control and report centre staffs, messengers and gas identification officers.

In addition, organizations have been created to man rest centres, mobile canteens, information bureaus, rehousing, billeting, salvage and other after-raid requirements. In certain cases local representatives of central government departments are associated with this side of the work; *e.g.*, assistance board.

Hospitals, ambulance trains and nonlocal ambulance services are administered and operated at a regional level by the ministry of health.

So far as the fire service is concerned a radical change has been made. A national fire service has been formed and the service was in 1941 operated and administered under central control instead of being a local authority service. The fire services operated in 43 forces each under a fire force commander.

Finally an organization of fire guards was introduced throughout the country, which is regarded as a complementary organization to that of the national fire service. It was linked closely with the wardens' service, and its task was to deal with incendiary bombs when they fell and to endeavour to prevent the starting of serious fires. (*See* also AIR RAID SHELTERS; GREAT BRITAIN: *Civil Defense.*) (E. J. H.)

Civil Liberties. Whereas U.S. involvement in previous conflicts usually meant widespread suppression of alien ideas and people (compare the notorious Palmer raids during World War I), and although similar suppression was feared for World War II, scrupulous adherence to the bill of rights on the part of the federal department of justice, including specifically the F.B.I., plus a widely publicized general governmental attitude of tolerance toward loyal foreigners resulted in few charges of alien baiting or persecution even being made—and this despite the fact that compulsory registration of all aliens as a measure of national defense revealed that there were up-

wards of 5,000,000 of them in the United States. The Dies committee of the house of representatives and the Rapp-Coudert committee in New York state (investigating teachers) continued their investigations into alleged subversive activities on the part of governmental employees. The shift in the communist party line from opposition to the United States war policy to active support of the governmental effort in the war, a shift occasioned by the German invasion of the soviet union, meant that in the second half of the year there were fewer claims of suppression on the part of the communists and also fewer efforts to suppress them. However, prosecutions for sedition commenced earlier in the year against the Trotskyite group in Minnesota resulted in convictions which were (Jan. 1, 1942) pending on appeal. It was expected that the eventual decision in the case would declare the permissible limits of the Smith "military disaffection" bill.

Supreme Court.—During 1941 the supreme court handed down a number of decisions further expanding the effective meaning of the Bill of Rights. Notable among them were decisions (a) holding squarely that the right to picket was included within the constitutional guarantees of free speech and free press; (b) declaring in clear terms the right of U.S. citizens to roam freely throughout the nation regardless of state laws against admission of indigents; and (c) confining punishment of newspapers and individuals for contempt of court to situations "where there is a clear and present danger of interference with justice." State courts followed in the liberal trend. An intermediate court in New Jersey held unconstitutional the New Jersey anti-nazi statute of 1935 which sought to gag expressions of racial and religious hatred. Also, courts in Massachusetts, New Hampshire and New York, despite the 1940 holding of the United States supreme court that public school students could constitutionally be compelled to salute the flag, upset orders of lower courts in those states committing to reform schools children of Jehovah's Witnesses who refused to salute the flag in public schools.

Radio.—The chief development in the radio field was the regulations promulgated by the Federal Communications commission on the basis of the commission's so-called "Monopoly Report." The validity of these regulations which were designed to effect greater diversity of control over the air waves was (Jan. 1, 1942) being contested in court. The commission also held hearings on the joint ownership by the same interests of newspapers and radio stations with a view to determining whether public policy was served by such joint ownership, but no regulations were issued.

Motion Pictures.—A proposed senatorial investigation into the propaganda content of Hollywood motion pictures proved abortive and was abandoned. In the field of motion picture censorship an important victory was achieved in New York when the state board of regents reversed a ban imposed by the board of censors on the Steinbeck-Kline film of Mexican life entitled *The Forgotten Village*. The major film companies, however, continued to avoid any censorship fight and meekly made changes recommended by local censors in such pictures as Garbo's *Two-Faced Woman*, forbearing to fight even in Providence, R.I., where the local police chief who did the censoring admitted that he had not even seen the picture.

Birth Control.—The legal status of medically prescribed birth control continued to be unsettled in both Connecticut and Massachusetts, although in both states efforts to obtain further clarification were still under way. By way of contrast the states in the deep south continued to expand their public health service to include contraceptive technique.

The American Civil Liberties Union, which continued to be the dominant agency in the field of civil liberties, concluded its survey for 1941 with a statement that "Liberty in the United States has never rested upon firmer legal foundations." (*See* also LAW: *Civil Rights.*) (M. L. E.)

Civil Service. One of the principal features of development in U.S. public service during 1941 was the marked expansion resulting from the requirements of defense and war. A few illustrative figures will make clear the increase in federal employment. In Jan. 1940 total federal employment was 939,000; in June 1940 it passed the 1,000,000 mark; in Jan. 1941 it had risen to 1,151,000; and in Oct. 1941 it slightly exceeded 1,500,000. State and local employment remained stationary in 1941.

These great increases were due in considerable measure to the expansion in civilian employment of the war and navy departments. In July 1940 civilian employees of the war department numbered 141,000; in Jan. 1941 this number had increased to 204,000; and in Oct. 1941 to 415,000. The civilian roll of the navy showed great, although not quite such extraordinary, expansion. In July 1940 its number of civilian employees was 126,000; in Jan. 1941 the number had increased to 176,000; and in Oct. 1941 to 264,000. By Dec. 30, 1941, these figures had substantially mounted.

Early in the defense program the decision was made to require defense and emergency employees to possess civil service status as far as possible. The U.S. civil service commission in 1941 was engaged upon the most extensive recruitment and placement program in its history, exceeding in scope the war expansion of 1917–18. Army and navy officials expressed complete satisfaction with the assistance received from the commission. The civilian defense agencies, such as the Office of Production Management, tended to employ men with business experience, without using the services of the civil service commission; but by the end of 1941 these agencies had become convinced of the necessity of a central corps of management personnel familiar with government procedures, and possessing civil service status.

U.S. civil service employees on June 30, 1941, numbered 990,000; employees exempt from civil service, 367,000. Both these figures increased substantially during the last six months of 1941.

An important new development in facilitating the supply of professional and scientific personnel became available in 1941—the National Roster of Scientific and Professional Personnel. This census and listing of professional and scientific personnel included at the end of the year more than 200,000 names, and many thousand important appointments to the federal service had been made from it. The roster seemed likely to have earned a permanent place in the recruiting procedures of the federal government for professional and scientific employees.

During the year the merit system continued to expand. An executive order of April 23, 1941, put into effect the Ramspeck act, covering in the federal civil service about 125,000 positions, effective Jan. 1, 1942. By the same executive order the president directed the appointment of a board of legal examiners and the extension of the merit system to federal attorney positions, in accordance with the recommendations of the majority of the president's committee on civil service improvement. In the states there was considerable improvement, although the state-wide merit systems still suffered from considerable hostility. Kansas adopted a state-wide merit system. Indiana adopted a merit system including state institutions, the department of health, the department of public welfare, county welfare organizations, unemployment compensation, the employment services and the state library. These gains were somewhat counterbalanced by the outright repeal of the New Mexico State Civil Service act of 1939 and by amendments to the Rhode Island Civil Service act which were unfriendly to the merit system, although in several instances in harmony with acceptable civil service practice.

During 1941 the installation of state merit system councils for state agencies, co-operating with the Social Security board, was completed, thus laying the foundation for a nation-wide demonstration of the value of the merit system in state and county government.

The New York state legislature enacted an important piece of legislation extending the merit system to all units of local government, expanding somewhat the authority of the state civil service commission and allowing localities either to adopt one of several optional forms of the merit system or to authorize the state civil service commission to operate the local system.

A considerable shortage of personnel experts developed during 1941, emphasizing the nation-wide search for talent in the personnel field. United States civil service examinations were announced for executive officers with salary ranging from $3,800 to $8,000, for training specialists, ranging from $3,200 to $5,600, and for personnel assistants, ranging from $2,300 to $3,800. The Louisiana state civil service commission announced a nation-wide examination for director of personnel at $7,500, the Kansas state commission a corresponding examination with a salary range from $4,000 to $6,000, and the Illinois state civil service commission an examination for executive officer at $5,000. In the municipal field, an examination for director of the reorganized St. Louis civil service agency was announced at $6,000, and Los Angeles continued its established practice by announcing an examination for personnel technician from $1,800 to $2,000. These examinations tended strongly to support the concept of a career service in the personnel field. At the end of 1941 the shortage in personnel men was even more marked.

Two important technical improvements occurred during 1941. Under the provisions of the Ramspeck act, appeals boards were established in each federal department and agency to hear appeals on service ratings. The composition of these boards was significant: the chairman was appointed by the civil service commission from its own staff, one member was appointed by the department or agency, and one member was elected by the employees of the department or agency. These boards were organized and ready to get into action in 1942.

The second technical improvement was the introduction of a plan for periodic increase of salary for federal employees, thus making general a practice which had already been established in a number of important agencies.

The proper status and function of union organizations in the public service continued to give rise to differences of opinion. The National Civil Service Reform league issued an important statement differentiating between the status of industrial and public-service unions, supporting the right of organization in the civil service but denying the privilege of collective bargaining, closed shop and the strike. The issue was particularly acute in New York city as a result of municipal ownership of the subway system. Previously existing collective agreements were declared by Mayor La Guardia to be incapable of fulfilment under municipal ownership and operation. The Transport Workers union took the position that it retained all its rights and privileges despite municipal ownership. At the end of 1941 the issue was pending before the courts. (L. D. W.)

Claussen, Julia (1879–1941), Swedish mezzo-soprano, was born June 11 in Stockholm. She made her debut at the Royal Opera house in Stockholm in 1903 and sang there for the next ten years. In 1913 she went to the United States, sang with the Chicago Opera company, 1915–16, and from

1917 to 1932 was with the Metropolitan in New York city, where she was famed as a singer of Wagnerian operas. King Gustavus V of Sweden bestowed the title of royal court singer upon Mme. Claussen in 1923. After her retirement from the stage, she taught music in Sweden and appeared occasionally as guest singer in the Royal opera. Mme. Claussen died at her home in Stockholm, May 1.

Clay, Laura (1849–1941), U.S. suffragist, was born Feb. 9 on a farm in Madison county, Ky. Her father, Gen. Cassius M. Clay, was a cousin to Kentucky's famous statesman, Henry Clay. After graduating from Kentucky State college—now Transylvania college—Miss Clay plunged into the movement to secure equal suffrage for women. She helped found and became first president of the Kentucky Equal Rights association in 1888. Through the efforts of this group, married women in Kentucky won the right to own property. Miss Clay then carried the fight for equal suffrage throughout Indiana, Ohio and Kansas, winning many converts to the new movement. At the Democratic National convention in 1920 she received one vote on the 36th ballot and thus became the first woman to receive a vote for the presidential nomination. She died at her home in Lexington, Ky., June 29.

Clay. No statistics are collected which include the total output of all types of clays in the United States, as the greater portion of the output is used directly by the producer in the manufacture of brick, tile or other heavy clay product. Sales of clays not used by the producer in 1940 increased 23% over 1939, to 4,847,519 short tons, valued at $19,633,568, a decrease of 15%. Imports are comparatively small, usually of the order of 5% of production, and exports are even less; conditions in 1941 upset the usual trend, however, with imports decreasing and exports increasing, leaving a net export for the year. The total reported includes kaolin, china clay, ball clay, fire clay, stoneware clay, bentonite (*q.v.*), fuller's earth (*q.v.*) and various minor types. (G. A. Ro.)

Cleveland. Sixth largest city of the United States, Cleveland, O., had a population of 878,336 by the federal census of 1940. Area, 73·74 sq.mi. Cuyahoga county, which includes Cleveland and its major suburbs, had a population (1940) of 1,217,250.

Former Common Pleas Judge Frank J. Lausche (Dem.) polled 145,108 votes to defeat Mayor Edward Blythin (Rep.), who received 94,767 votes in the November election. It was the largest margin ever recorded in a Cleveland mayoralty election. Republicans retained theoretical control of the city council, although their majority was reduced by the election.

Mayor Lausche appointed to his cabinet Thomas A. Burke, Jr., as law director, Eliot Ness as safety director, Joseph T. Sweeny as finance director, William D. Young as public utilities director and Samuel T. David as director of public service. As an economy measure the mayor discharged 50 city employees in the opening weeks of his administration.

Sheriff Martin L. O'Donnell, 54, died of a heart attack June 22, in the midst of a campaign by the Cleveland Bar association to remove him from office for alleged failure to close gambling clubs. County commissioners appointed Joseph M. Sweeney, a Cleveland detective inspector, to succeed him.

Appointment of Emerich B. Freed, who had been United States attorney in the Cleveland district for eight years, as judge of the United States district court was confirmed by the senate Oct. 2. Don C. Miller was nominated by President Roosevelt to succeed Freed as district attorney. U.S. Attorney General Francis Biddle named Henry A. Hauxhurst, Col. Otto Miller and Francis R. Bacon as the alien enemy hearing board for the Cleveland district.

Increased revenues enabled the board of education to restore in Dec. 1941 the 10% salary cuts it voted for employees in June.

Stockholders of the Cleveland Railway Co. in November authorized sale of the street railway system to the city government on the basis of the city's offer of $45 a share, or a total of $14,127,280. To conclude the transaction, the city was to sell bonds to cover that amount.

Under the impetus of defense contracts, business reached a new peak in Cleveland in 1941. Industrial expansions and improvements in the 18 months ending Dec. 31, 1941, exceeded $150,000,000. Cleveland probably is the greatest aeroplane parts centre in the U.S. and factories in 1941 were working on more than $1,000,000,000 of direct and indirect defense orders. Employment increased 35%. Fifty-four new companies started operating in Cleveland, using 323,415 sq.ft. of manufacturing space. To house defense workers, 7,270 new home units were erected at a cost of $45,988,432. By the close of the year, the $6,000,000 Cuyahoga river widening project was virtually completed to enable iron-ore carriers to go up the river in 1942 in the race to keep the steel mills supplied.

Cleveland postal receipts reached an all-time high of $10,250,000 in 1941, and income tax collections more than doubled those of 1940. Union Trust Co. depositors received a liquidating dividend which brought the pay-off to 90%, while depositors of the Standard Trust bank received a final liquidating dividend which brought the total payment to 78½%. (P. By.)

Clifford, Sir Hugh (1866–1941), British colonial governor, was born March 5 in London. Sir Hugh resigned from the colonial service in 1929 after a 26-year career as government official. He was also known as a scholar and writer and authority on the east, particularly Malaya. Among his books are *Some Reflections on the Ceylon Land Question* (1927) and *Bush-Whacking and Other Asiatic Tales and Memories* (1929). He died Dec. 19. (*See Encyclopædia Britannica.*)

Climate: *see* METEOROLOGY.

Clothing Industry. Production and retail sales in 1941 increased over 1940; so did military garment production. Because of industrial activity there were greatly increased sales of work garments. Slack and shirt combinations continued to be favourites for summer wear. Regular clothing followed the past seasons with comfortable semidrape effects. Sportswear was important, emphasizing special garments for individual sports. Popular ski wear featured colourful, light and heavyweight materials in designs to give freedom of action.

The textile market suffered from defense preparations. Price ceilings and a woollen conservation plan were put in operation. In December the industry was faced with the necessity of altering clothing designs to meet fabric shortages, presaging the abolition of some clothing elements hitherto considered standard. New fibres were developed to bolster the market. Increased importation of woollens was expected to be necessary.

The trimmings industry was greatly affected by the war. Thread, buttons, linings, etc., were more difficult to obtain; slide fastener production was reduced. Needles became scarce.

Machinery manufacturers continued developing laboursaving devices. New shirt-pressing conveyors, folding, creasing, button-sewing, clothes-pressing and cloth-laying machines were offered to manufacturers. In addition the straight-line system of production patents was purchased and made public property.

The government standardization of boys' sizes was accepted by the retailers and in the future all boys' clothing would be sold on a

hip-girth and height basis rather than the former age size system. This would greatly aid the consumer.

The end of the year brought priorities to the clothing industry. Americans were expected to be warmly clothed, however, during the war years and the American soldier would continue to be the best-dressed soldier in the world.

For 11 months of 1941, with 56% (based on value) of the clothing industry reporting, total units cut (including suits of wool, cotton, linen, mohair, trousers and knickers, overcoats, topcoats and separate coats, but not including dress pants, work clothes, shirts, leather garments, pajamas and very heavy coats) in the men's, young men's and boys' regular clothing industries totalled 25,949,000 compared with the 1940 11 months figure of 25,208,000. Cuttings in 1941 in the garment field were considerably higher than in 1940; these cuttings were (based on 77% of the value of total production): overalls and industrials, 6,397,717 dozen; work and semidress pants, slacks and shirts, 6,913,882 dozen; lined and leather coats, lumberjacks, mackinaws, ski suits, snow suits, hunting coats, oiled garments, shirts, pajamas, wash suits, and miscellaneous, 23,132,000 dozen. Uniform cuttings in April to Nov. 1941, inclusive, under government contract, totalled approximately 13,786,000 pants, coats and overcoats combined.

British manufacturers in 1941 had to turn 85% of their production over to military clothing. A coupon rationing system was imposed on the consuming public under which better-made clothing flourished and work garment production increased.

(H. Sn.)

Cloves: *see* Spices.

Coal. Coal production data have been so scarce that it has been impossible to estimate world production since 1938, when it was 1,469,000,000 metric tons. However, since about three-quarters of the normal output comes from Germany, United States, Great Britain and U.S.S.R., it may be pretty safely assumed that the magnitude of the war effort in those countries will have resulted in some increase, though production in countries like Czechoslovakia, Poland, Belgium, the Netherlands and France has declined. Data were available from only a few countries outside the United States, and in those production was comparatively small.

Table I.—*Coal Production of the World*

(Millions of metric tons—all grades)

	1929	1932	1937	1938	1939
Canada	15.87	10.65	14.37	12.97	14.08
United States	552.31	326.10	447.58	358.01	403.28
Belgium	26.93	21.42	29.86	29.58	29.85
Czechoslovakia	29.08	26.82	34.67	26.60	?
France	68.49	57.70	45.33	47.56	51.00
Germany	348.61	227.39	372.70	384.92	430.00
Netherlands	11.74	12.88	14.46	13.66	13.06
Poland	46.31	28.87	36.24	38.11	?
United Kingdom	262.05	212.08	244.27	230.66	236.70
U. S. S. R.	38.42	53.60	127.00	132.89	?
China	?	28.00	?	?	?
India	22.50	20.48	26.09	29.52	28.21
Japan	36.14	28.22	?	?	?
South Africa	13.02	9.92	15.49	16.28	16.89
Australasia	14.88	13.21	18.03	17.87	10.83
Total	1,559.00	1,124.00	1,550.00	1,469.00	?

United States.—Production of coal in the United States in 1940 increased 13% over 1939, to 503,300,000 short tons, and preliminary estimates for 1941 indicated a 10% increase over 1940, to 556,500,000 tons; this total included 501,000,000 tons of bituminous, an increase of 11% over 1940, and 55,500,000 tons of anthracite, an increase of 6% over 1940. This was the highest total attained since 1930, but was still a far cry from the 678,812,000 tons reached by the war peak of 1918. Production during most of the second half of 1941 was at a rate approximating 630,000,000 tons for the year, but this was reduced to the figure estimated above, by the following losses: 9,000,000 tons during the first quarter while production was building up; 50,000,000 tons during the second quarter while new contracts were being negotiated; 12,000,000 tons in vacation and holiday periods during the year; and 3,000,000 tons during the captive mine strike during November, a total of 74,000,000 tons lost during the year, as compared with what might have been produced.

Taking the year as a whole, production conditions were much less stable than in 1940, and fluctuations in output were far greater. The distribution of production by states is shown in Table II, the data for 1941 being estimated from incomplete returns.

Table II.—*United States Production of Coal*

(Millions of Short Tons)

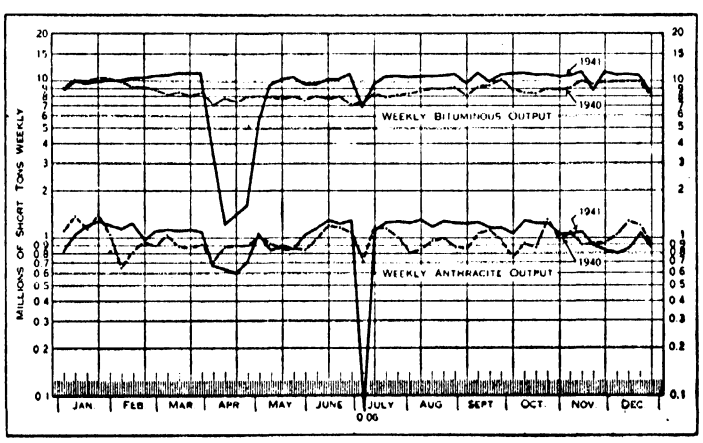
	1929	1937	1938	1939	1940	1941
Alabama	17.9	12.4	11.1	12.0	15.2	15.1
Colorado	9.9	7.2	5.7	5.9	6.5	6.8
Illinois	60.7	51.6	41.9	46.5	49.5	53.2
Indiana	18.3	17.8	14.8	16.7	18.6	22.4
Kentucky	60.5	47.1	38.5	42.8	48.4	53.0
Ohio	23.7	25.2	18.6	19.6	22.1	29.5
Pennsylvania	143.5	111.0	77.7	92.2	112.9	121.1
Tennessee	5.4	5.2	4.5	5.3	6.0	6.7
Utah	5.1	3.8	2.9	3.3	3.5	3.9
Virginia	12.7	13.8	12.3	13.2	15.0	17.9
West Virginia	138.5	118.6	93.3	107.9	126.3	139.0
Wyoming	6.7	5.9	5.2	5.4	5.7	6.5
Others	32.1	25.9	22.1	22.3	23.6	26.0
Total Bituminous	535.0	445.5	348.5	393.1	453.2	501.0
Anthracite	73.8	51.9	46.1	51.5	50.1	55.5
Grand Total	608.8	497.4	394.6	444.6	503.3	556.5

Although none of the more important producing states showed a decrease in output in 1941, the bulk of the improvement was in West Virginia and Pennsylvania, since those are the heaviest producers. It is also to be noted that while the 1941 total was well below that of 1929, Indiana, Ohio, Tennessee, Virginia and West Virginia equalled or exceeded their 1929 outputs.

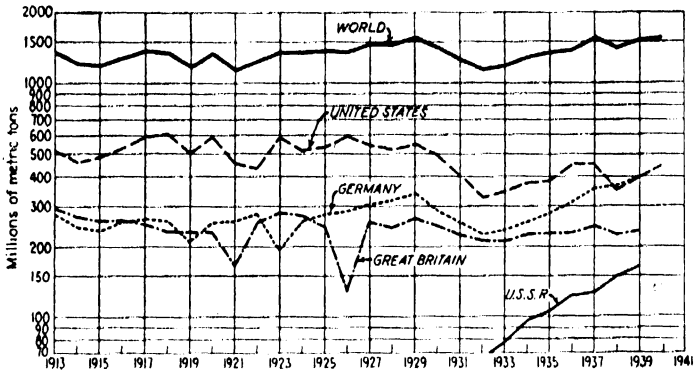
The accompanying graph of weekly production indicates the trend throughout 1941, both for bituminous and for anthracite coal. The break in both curves in the first week of July included not only the usual Fourth of July holiday, but also marks the beginning of the vacations granted miners in some areas, which accounts for this break being larger than that for any of the other holiday weeks.

There is normally little foreign trade in coal; imports, usually well under a million tons, were 545,000 long tons in 1940 and 630,000 tons for the first three-quarters of 1941; exports ran somewhat higher, at 19,434,000 tons in 1940 and 16,248,000 tons in the first three-quarters of 1941; these figures included bunker fuel and the coal equivalent of coke.

Canada.—Coal production to the end of Oct. 1941 was 14,535,316 short tons, as compared with 14,016,547 tons in the same period of 1941; this was at an average rate of 17,442,000 tons for



WEEKLY PRODUCTION of anthracite and of bituminous coal in the U.S., 1941



COAL PRODUCTION OF THE WORLD and the major producing countries, as compiled by *The Mineral Industry*

the year, but as production toward the end of the year was higher than earlier, the year's total was expected to approximate 18,000,000 tons, and might possibly somewhat exceed this figure, in comparison with 17,551,000 tons in 1940.

South Africa.—An output of 10,621,639 short tons was reported in the first half of 1941, an increase of 18% over the same period of 1940; the 1940 total was 18,934,000 tons.

Minor Producers.—Chile produced 900,000 metric tons in the first half of 1941, Netherlands East Indies the same, and Spain 4,200,000 tons, India 6,375,000 tons in the first quarter, and Turkey 1,037,000 tons to the end of April. Lignite production was 5,482,000 metric tons in the first half of 1941 in Hungary, and 1,061,000 tons in Rumania. (*See* also FUEL BRIQUETTES.)

(G. A. Ro.)

Coast and Geodetic Survey, U. S.

The surveying and charting of the coastal waters of the United States and the production of nautical charts and coast pilots for navigation during 1941 were conducted entirely in accordance with the needs of the national defense. Comprehensive tide and tidal current observations and the investigation of the earth's magnetism were a part of this program. Requirements of the land and military forces received attention through close co-operation. New aeronautical charts were produced for air navigation and geodetic control surveys extended in areas desired by the army for training and for defense mapping.

The rapid expansion of the land, sea and air forces taxed the resources of the bureau to provide sufficient surveys to meet new demands. Modern survey methods in areas needed for naval operations resulted in discovery of dangers to navigation of utmost importance to large-scale chart construction. Three series of aeronautical charts were maintained with standard information vital to pilot training courses and for general air navigation. A threefold increase over the normal requirements of the military services was noted in the number of aeronautical and nautical charts issued.

The ship "Explorer," following the 1940 trial season in western Alaska, successfully accomplished extensive surveys in the vicinity of the Aleutian Islands. This ship was designed to perform combined surveying operations in isolated waters where long cruises away from supply bases might be required. It is completely equipped with the latest devices for shoal and deep water hydrography and for auxiliary operations. The "Explorer" is the most modern survey ship afloat.

The year 1941 was especially marked by the productive results obtained from the installation of many new surveying devices which had been under design, development and trial in the past few years. Among these, the most important were the Dorsey fathometer No. 3 and the automatic depth recorder to supplement the fathometer. The technique of shoal water hydrography has been completely altered by the extensive use of these improved echo sounding machines. A new portable tide gauge, thermostatic control of gravity pendulum apparatus and a transit magnetometer attachment were perfected.

There was inaugurated in 1941 a program of scientific co-operation with various American republics, by tidal measurements initiated in eight of these countries and by a comprehensive series of observations of gravity and location of base stations in Peru and Colombia. These projects were performed with coast and geodetic survey methods and American instruments under arrangements for participation by technical personnel in the countries visited. From the cordial reception received it is indicated that further scientific projects will be undertaken, to the material advantage of the scientists of the western hemisphere.

(L. O. C.)

Coast Guard, U.S.

The activities of the United States coast guard were considerably expanded during 1941.

The more outstanding of the year's activities may be summarized as follows: An increase in the number of authorized enlisted men in the service; an increase in the size of the entrance class at the Coast Guard academy and the expansion of the academy's physical plant; a stepping up of the tempo of the training program for enlisted personnel; co-operation with the navy, consisting of the supplying of ships and personnel for various special duties; augmentation of the coast guard fleet of vessels constituting the greatest shipbuilding program in the history of the service; an increase in the force at the coast guard yard at Baltimore for the reconditioning and rearmament of ships; the construction of building ways and a floating drydock at the coast guard yard and the erection of new buildings necessary for the construction of ships; the active participation by ships, small boats and planes in the neutrality patrol; the increase in the number of officers serving as captains of the port and a substantial expansion of the duties of such officers; the reorganization of the former nonmilitary coast guard reserve into the present coast guard auxiliary, and the setting up of a full military coast guard reserve as a result of recent legislation.

Other activities of 1941, hardly less important, were: special efforts to expedite the opening of navigation upon the Great Lakes as a national defense measure; the assumption of the operation of a national system of radio direction finder stations of great use to shipping as well as a valuable adjunct of the nation's coastal defenses (previously maintained by the navy); an increase in the number of aids to marine navigation over and above the normal annual expansion; the marking of foreign waters adjacent to recently acquired naval bases to facilitate the movement of United States ships; and the rebuilding of a number of coast guard vessels to provide the dual capacity of maintaining navigational aids and performing patrol duties.

In 1941 the coast guard had under construction in private shipyards the following ships and boats: one 230-ft. ice-breaking tender; seven 180-ft. ocean-going tenders; three 113-ft. river tenders; two 110-ft. harbour cutters; one 110-ft. barge; one 73-ft. river tender; one 65-ft. buoy boat; forty 83-ft. patrol boats; and one 300-ft. floating drydock.

Coast Guard Academy.—Appointment of 146 cadets to the Coast Guard academy followed the holding of competitive examinations in May 1941. A total of 1,771 candidates competed in this examination. The group actually appointed represented the second largest entering class in the history of the academy. The largest class (147 cadets) entered in 1940.

The congressional board of visitors, after its annual inspection of the academy in May 1941, expressed itself as pleased with the high type of educational institution maintained by the coast guard for the training of its future officers and with its curriculum ably supervised by the advisory committee com-

U.S. COAST GUARDSMEN boarding a German tanker in Boston March 30, 1941 after President Roosevelt ordered the seizure of 28 Italian, two German and 35 Danish merchantmen tied up in U.S. ports

posed of five leaders in the field of education. The congressional board recommended the construction of a chapel at the academy.

During 1941 extensions to the cadet barracks and the library were constructed, providing the necessary additional space for the increasing number of cadets.

On April 12, 1941, the Coast Guard academy received as a gift the schooner "Atlantic" from Gerald B. Lambert, rear commodore of the New York Yacht club. The "Atlantic" is a three-masted steel schooner of 303 gross tons, with masts 147 ft. high. It is 185 ft. long overall, with a breadth of 29 ft., and has a reciprocating steam engine of 250 h.p.

The annual practice cruise of the first and third classes took place during the summer aboard the "American Seaman." During this cruise the cadets visited St. Thomas, Virgin Islands; San Juan, Puerto Rico; Kingston, Jamaica; and United States ports along the Atlantic coast.

Enrolment at the beginning of the fall semester in 1941 was 341, of which 31 were in the first class, 73 in the second class, 92 in the third class and 145 in the fourth class. (R. R. W.)

Coast Guard Academy, U.S.: *see* COAST GUARD, U.S.

Cobalt. The cobalt-bearing products formerly shipped from the Belgian Congo to Belgium for treatment were being shipped to the United States, where they are smelted along with smaller amounts of Canadian material. As a result, imports of cobalt metal into the United States have almost ceased. Smelting and refining operations in England were also reported to have been expanded, and a new plant for the production of cobalt oxide from local ores was said to have been started in Italy. (*See* also METALLURGY.) (G. A. RO.)

Cochin-China: *see* FRENCH COLONIAL EMPIRE.

Cocoa (CACAO). Growers of cocoa in the western hemisphere had the unusual experience in 1941 of having one of the very few tropical food crops that in some measure profited from the war. Although a large part of the European market was cut off, competition in the New York market from African cocoa beans was greatly curtailed by shortage of ocean shipping. Prices paid growers in the Dominican Republic in 1941 were more than double those of 1940. The Dominican crop was estimated at 2,000,000 bags of 60 kg. each. Exports for the first nine months were 15,599,063 kg. in 1941 and 20,362,069 kg. in 1940. In Nigeria, Africa, the heavy crop was 90,188 tons and the light crop 6,400 tons in 1941, compared to a heavy crop of 98,510 tons and a light crop of 5,629 tons in 1940. The latter light crop was destroyed as an unusable surplus. None of the 1941 crop was destroyed. Ecuador reported the 1941 crop as the largest in several years. Up to Sept. 30, cocoa receipts at Guayaquil were 246,186 quintals of 101·4 lb. each, compared to 162,524 in the same period in 1940, although Peruvian troops occupied a large part of the cocoa-producing area. The 1941 crop of Bahia, Brazil, was estimated at 2,000,000 bags of 60 kg. each. Up to Sept. 30, shipments to the United States were 240,900 bags in 1941 and 183,000 bags in 1940. The 1941 crop in Venezuela, estimated at about 12,000,000 kg., was practically all shipped to the U.S. The 1940 crop in Venezuela was 15,246,304 kg. In the British West Indies, exports to Nov. 1 were 60,290 cwt. of 112 lb.

each, compared to 51,509 in the same period of 1940, while exports from Trinidad and Tobago were 18,627,163 lb. compared to 23,515,626 lb. in the ten months of 1940. (S. O. R.)

Coco-Nuts. More than half the United States imports of fats and vegetable oils (about 1,600,000,000 lb. in 1941) ordinarily comes from Pacific ocean countries. A large part consists of coco-nut oil, copra, copra meal and oil seeds mostly from the Philippines. Outbreak of war with Japan in Dec. 1941 cut off these Pacific sources from the United States. Coco-nut, edible, in drums and less than car lots, was quoted at 15.2 cents in New York city in Dec. 1941, as compared to 7.5 cents in Dec. 1940. Crude coco-nut oil, in tanks, f.o.b. Pacific coast, also increased proportionately, while copra which sold at $22.20 per ton in Los Angeles in Dec. 1940, rose to $42.50 per ton in Dec. 1941, following the outbreak of war. Copra meal, f.o.b. Pacific coast in 100-lb. bags, was $1.42 in Dec. 1940, and $5.12 in Dec. 1941. United States consumption of coco-nut oil increased sharply in 1941, partly because of the need for greater supplies of fats and oils in defense activities, but also because new federal regulations of 1941 (the McNutt standard) encouraged the manufacture of oleomargarine. (*See* BUTTER.) In Nov. 1940, 1,664,000 lb. of coco-nut oil were used in the United States to manufacture oleomargarine. By Dec. 1941 monthly consumption in the manufacture of oleomargarine in the United States was 4,198,000 lb. U.S. imports of coco-nut oil in 1941 (preliminary estimate) were 298,500,000 lb., compared to 259,900,000 lb. in 1940 (crude oil plus refined oil converted to crude basis). The bulk of the imported coco-nut oil is used in the manufacture of soap, oleomargarine and cooking fats. Coco-nut oil was included in the price ceilings on 1,800 oils and fats established by the OPM. (*See* VEGETABLE OILS AND ANIMAL FATS.) (S. O. R.)

Coffee. Western hemisphere trade in coffee in 1941 entered a new and unique era, that of co-operative quota exports by all 14 American coffee-producing countries and quota imports by the United States, the largest coffee-consuming country, from each producing country. This arrangement was described in *Foreign Commercial Weekly*, Nov. 15, 1941, of the U.S. department of commerce as "an act of inter-American co-ordination which for its inauguration required 129 years of experience and oratory." The inter-American agreement averted a "coffee war," restored a substantial measure of stability to the coffee market, which had been badly disrupted by war, and prevented severe if not ruinous effects on the economy of smaller producing countries which could not otherwise compete with Brazil. Brazil, according to the department of commerce, can produce in 12 months all the coffee normally consumed by the whole world in 14 months. As a further effect of the inter-American coffee agreement, prices of coffee in the United States almost doubled in some grades and more than doubled in other grades between Sept. 1940 and Sept. 1941. For example, a popular brand of coffee that retailed at 3 lb. for 39 cents in 1940 sold at 3 lb. for 53 cents in 1941. In addition to its agreement to take some 15,500,000 bags of coffee annually from the 14 American countries, the United States reserved a quota of 355,000 bags annually from other countries. In contrast with this re-establishing of an orderly and equitable market for a commodity of international trade, the U.S. department of commerce pointed to the action of Germany in 1939 when that country bartered for surplus Brazilian coffee and then, before shipping merchandise to Brazil, dumped the coffee on world markets at prices so cheap that other Brazilian coffee could not be moved.

The Inter-American Coffee board, which operates the coffee agreement, made changes in the basic quotas in May and Aug. 1941 to equalize shipments. On Oct. 23, 1941, it authorized shipments up to 15% excess of quotas, to be charged against 1942 quotas for release for consumption after Oct. 1, 1942. Since all countries subscribing to the coffee agreement produce substantially more than their export quotas and since the quotas determine specifically the quantity that may enter international trade, reports of annual production have little importance. The basic annual quotas, which determine quotas of exports, were adopted in Washington Nov. 28, 1940, by the inter-American coffee agreement and are as shown in the table, in 132-lb. bags.

Basic Annual Export Quotas of Inter-American Coffee Agreement

	Exports to the United States	Exports to other countries
Brazil	9,300,000 (bags)	7,813,000 (bags)
Colombia	3,150,000	1,079,000
El Salvador	600,000	527,000
Guatemala	535,000	312,000
Mexico	475,000	239,000
Venezuela	420,000	606,000
Haiti	275,000	327,000
Costa Rica	200,000	242,000
Nicaragua	195,000	114,000
Ecuador	150,000	89,000
Dominican Republic	120,000	138,000
Cuba	80,000	62,000
Peru	25,000	43,000
Honduras	20,000	21,000

Coffee consumption increased sharply in the United States in 1941 because of the expansion of armed forces. Consumption per soldier is about 60% more than the annual per capita consumption. Coffee was rationed in amounts varying from 1 oz. to 3½ oz. per week per person in Denmark, the Netherlands, Germany, Belgium and occupied France. This included substitutes as well as coffee. Before the war Germany was the world's second largest consumer of coffee. In Italy coffee was restricted to use by hospitals and the armed forces. While figures on world production are generally fragmentary, reports from the dominant producing country, Brazil, indicate a small 1941 crop, estimated at 12,787,400 bags, because of unfavourable weather. This together with the carry-over would give Brazil, it was estimated, 18,786,400 bags available for export up to March 31, 1942. The new caffelite plant in Brazil, to produce plastics from coffee, was scheduled to begin operations in 1941, and was designed to utilize 5,000,000 bags of surplus coffee. If the test proved successful the plant would be enlarged. American Airlines in Oct. 1941 adopted a custom of christening new planes with coffee. India, which is endeavouring to popularize coffee in the tea-drinking United Kingdom, reported the 1941 crop as one of the shortest on record: 238,418 bags of 60 kg. The Netherlands Indies crop was estimated at 1,250,000 bags. (*See* also BRAZIL; GUATEMALA.) (S. O. R.)

Coinage. The bureau of the mint is an adjunct of the treasury department. It consists of eight field institutions in widely scattered localities and the administrative office in Washington. The eight institutions are all administered by the director of the mint. There were in 1941 three coinage mints: in Philadelphia, Pa., Denver, Colo., and San Francisco, Calif.; assay offices in New York, N.Y., Seattle, Wash., and New Orleans, La.; a bullion depository for storage of gold at Fort Knox, Ky., and a bullion depository for storage of silver at West Point, N.Y.

Coinage manufactured by the United States mints for the United States during the calendar year 1941 was the largest in the history of the mint, amounting to 1,827,486,276 pieces, valued at $102,209,510.45.

Half dollars	43,553,812 pieces
Quarter dollars	111,842,087 pieces
Dimes	263,830,557 pieces
Nickels	300,160,720 pieces
Cents	1,108,099,100 pieces

All mint records for monthly coinage in the United States

were broken in Dec. 1941, when 247,152,492 pieces were struck, the largest production in any one month since the founding of the mint in 1792.

Coinage for foreign governments amounted to 208,603,500 pieces. The U.S. mints in 1941 executed coins for Curaçao, Dominican Republic, Indo-China, Liberia, Netherlands East Indies and Surinam.

Gold and Silver Acquisitions.—Net gold acquisitions by the mints and assay offices of the United States during the calendar year 1941 amounted to approximately $741,781,000. Net silver acquisitions by the mints and assay offices of the United States during the calendar year 1941 amounted to approximately 90,874,000 fine ounces. (N. T. R.)

Coke. The 1940 coke production of the United States rose 29% over that of 1939, with 54,014,300 short tons of by-product coke and 3,057,800 tons of beehive coke, a total of 57,072,100 tons, to which there might also be added 4,165,450 tons of coke breeze or screenings. The years output required the use of 81,385,000 tons of bituminous coal, or 18% of the output for the year. There was a large increase in the number of ovens during the year, which was necessary to take care of the increased output; the number increased from 23,666 to 27,884, and 1,842 additional ovens were under construction at the end of the year. The total number of ovens built or building during the year was 6,770, while the number dismantled was only 710. The largest consumer of coke is the iron blast furnace, which took 75% of the output, or 42,484,000 tons; domestic use took 14%, gas production 5% and foundries 4%.

Both exports and imports of coke are small.

Production during the first ten months of 1941 reached 53,563,673 tons, a 15% increase over the same period in 1940. The total for the year might be expected to be as much as 64,000,000 tons, and might even be more, as compared with the former record high of 56,478,000 tons, made in 1918.

Normally the United States is the world's foremost producer of coke, followed by Germany, Great Britain, U.S.S.R., France and Belgium, but no information was available on production outside of the United States. (G. A. Ro.)

Cold, Common. The common cold is established as an epidemic virus infection of the upper respiratory tract frequently confused with other conditions, limited to four or five days' duration and of itself comparatively inconsequential. It prepares the way for secondary infection. Employed workers lose an average of one day a year from this cause, or a total loss of 45,000,000 days of work a year. The monetary loss may be close to $1,000,000,000.

Numerous attempts at prevention have been made: Walsh used an intranasal vaccine spray in nearly 400 patients over a period of eight years and reported good results in about three-quarters, failures in 16% and fair results in the rest; antiseptic snuffs have been tried in Britain in connection with shelter life, but the results, so far as the prevention of colds is concerned, have so far been inconclusive; large doses of vitamins were tested by Kuttner for their effect on the incidence of colds and upper respiratory infections in rheumatic children, but no evidence was obtained to suggest that this reduces the incidence of these infections; irradiation of the air in a children's ward in a hospital was tried for its effect on reducing the incidence of respiratory infections, and it was concluded that this method holds promise. Additional reports on the attempted prevention of colds by the use of oral vaccines appeared, but the results seemed highly questionable.

Few types of treatment were reported: Studies based on three and a half years' work have not demonstrated any value in the linseed oil concentrate treatment of the common cold; a controlled study on the possibilities of aborting colds with either benzedrine inhaler or a codeine-papaverine mixture gave encouraging but not conclusive results. (E. P. J.)

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Colleges and Universities: *see* UNIVERSITIES AND COLLEGES.

Colombia. A republic in northern South America bordering both the Caribbean and the Pacific. Area, 448,794 sq.mi. The population (1938 census: 8,724,839) was officially estimated at 9,334,392 in 1941. Capital is Bogotá (331,400). Other leading cities are Medellín (170,622), Barranquilla (152,348), Cali (110,579), Cartagena (86,197), Manizales (83,346), Ibague (61,860), Cucuta (57,251), Bucaramanga (49,891), Pasto (49,533), Neiva (34,699), Santa Marta (33,163), Popayán (24,479), Tunja (20,417). The population is very largely concentrated on the eastern Andean plateau, the interior departments of Antioquia and Caldas and the upper Cauca valley. Religion: Roman Catholic. President in 1941: Dr. Eduardo Santos.

History.—Colombian history in 1941 was marked externally by efforts to maintain a relative neutrality in World War II, with, however, frank support of the policy of American solidarity; and internally by political conflicts preliminary to the presidential elections of 1942. Although drawn steadily toward the world conflict in 1941, Colombia sought to maintain its strictly neutral position. Pres. Santos himself formally declared hemisphere solidarity to be the keystone of Colombian foreign policy.

Throughout the year evidence of nazi propaganda and other activity continued to pile up. Three Germans were jailed in January for suspected espionage. Further arrests followed disclosure, in August, of a well organized axis plot to infiltrate the army with propaganda. Resentment was felt by some Colombians at Pres. Roosevelt's disclosure, in September, of the existence of secret nazi air bases on Colombian soil within striking distance of the Panama canal. Government investigation, however, verified the charges.

Some indignation was felt, too, upon publication of the United States anti-axis blacklists in July. A senate investigation, however, showed only 10% of the affected firms in the country to be Colombian-owned, and a third of these were deleted from the list. On the other hand, relations with the United States were brought closer through a $12,000,000 United States Export-Import bank loan to be used for the construction of hydroelectric plants, roads and irrigation development.

Upon the Japanese attack on the United States in December, Colombia promptly severed diplomatic relations with Japan, and later with Germany and Italy, and declared its intention to regard the United States and other American nations as still possessing the rights of nonbelligerents.

Internally, the country was torn by political turmoil, with both Liberals and Conservatives split. The March congressional elections continued Liberal control of congress, but left the Liberals sharply divided between supporters of moderate Pres. Santos and relatively radical former Pres. Alfonso López, who loomed as the probable official Liberal candidate in the 1942 presidential elections. López' political strength derived from the New Deal legislation and policies of his administration

(1934–38); his attitude toward international developments was essentially "non-interventionist," although his public utterances were marked by equivocal pro-United States declarations. In August the Liberal party presidential nomination convention was controlled by the Lopistas, but López was unable to obtain the two-thirds vote necessary for nomination, and deadlock resulted. The convention did, however, give its endorsement to Pres. Santos' foreign and domestic policies. Eventually (Sept. 4), the Lopistas formally proclaimed López as the Liberal nominee, but a dissident anti-López group seceded and nominated its own candidate. The Conservative party, in the minority since 1930, declined to nominate a candidate of its own and gave support to the anti-López Liberals. Embittered by the López candidacy, 13 anti-López Liberal senators and the entire Conservative membership of the senate resigned in protest. The breach was further evidenced by a Conservative–anti-López Liberal fusion to control the lower house of congress. Amid this setting, faction-torn Colombia prepared for the presidential campaign itself. In view of Colombia's record of nearly 40 years without revolution—longer than any other country of Latin America—it was generally conceded that the election results would be accepted.

Education.—In 1939 there were 8,959 primary schools (enrolment 606,250), mostly public, 450 secondary (enrolment 34,599), including 75 public and 34 normal (enrolment 3,699). All schools, including specialized, numbered 10,312 (enrolment 700,677). The National university, at Bogotá, and the University of Medellín are the most important universities.

Finance.—The monetary unit is the peso (value: 57 cents U.S. in 1941). On May 31, 1941, the national debt was 236,811,300 pesos (internal 100,592,419 pesos). In May 1941 definitive adjustment was made on $50,000,000 of partially defaulted external dollar bonds.

Trade.—In 1940 imports (mainly textiles and other manufactures) were valued at 148,192,000 pesos (a 19.2% decline), the United States supplying 74.4% (1939: 54%) and Great Britain 8.4% (9.5%). Exports were 166,386,000 pesos (a 6% decline), largely to the United States, 69.8% (1939: 66.9%), Canada 11.3% (7.1%), Curaçao 7.8% (8.1%), France 3.1% (3.1%), Great Britain 1.9% (1.4%). Germany's share of 1940 exports and imports was 0.6% each, against 7.3% and 12.8%, respectively, in 1939. The chief export commodities are: coffee, 44.5% in 1940 (1939: 49.2%), gold, 25.1% (22.9%), petroleum, 24% (18.1%), bananas, 3.4% (4.9%). Coffee and gold go almost entirely to the United States, petroleum chiefly to Canada (1940: 38.4%).

Communication.—Maritime communication is mainly through Cartagena and Barranquilla, which handle more than half the foreign trade, with Santa Marta and the Pacific ports of Buenaventura and Tumaco also important. External air service is by Pan American Airways. Owing to inadequate land communications, air transport effects greater time saving from Bogotá to the main currents of world trade than from any other world capital. The important state-owned internal air lines are well developed. In 1941 the Magdalena river, 3,282 km. of railway and a 10,000-km. highway system (supplemented by departmental roads) provided internal communication, but were not well integrated.

Agriculture. Agriculture, supporting 70% of the population, is the basic industry. Colombia ranks second to Brazil in coffee production and leads in "mild type" coffees. Export in 1941 was under the Inter-American Coffee Quota, with a 1941–42 allotment of 3,494,774 bags for export to the United States. Coffee's importance in Colombian economy arises not merely from the volume of output, but also from the fact that the industry, unlike banana and mineral production, is Colombian-owned. To peg 1942 prices, 16,000,000 pesos (a fifth of the budget) was allocated for purchase of excess production. Bananas, second agricultural export, declined in 1940. The United States and Great Britain took most of the crop, but British import restrictions deprived Colombia of that market in 1941.

Manufacturing.—In 1939, 1,378 manufacturing plants represented a 108,864,000-peso investment, with textiles, beer, sugar, cement and cigars and cigarettes the leading manufactured products.

Mineral Production.—Colombia in 1941 ranked ninth in world petroleum production (1941: 24,400,000 bbl. est.; 1940: 26,864,000 bbl.; 1939: 23,857,000 bbl.). The chief metals are gold (1940: 631,927 oz.) and platinum (23,671 oz.). (L. W. BE.; J. S. CU.)

Colorado, a Rocky mountain state of the United States, in the west-central part; mean elevation above sea level, 6,800 ft. Admitted to the union in 1876 as the 38th state and known as the "Centennial state." Area, 103,967 sq.mi. Population (1940), 1,123,296; 52.6% urban, 47.4% rural. Capital and largest city, Denver, 322,412. Other cities in order: Pueblo, 52,162; Colorado Springs, 36,789; Greeley, 15,995; Trinidad, Boulder, Grand Junction and Fort Collins, 12,000 to 15,000.

History.—Governor, Ralph L. Carr (R.); lieutenant governor, John C. Vivian (R.); secretary of state, Walter F. Morrison (R.); auditor, Charles M. Armstrong (R.); treasurer, Homer F. Bedford (D.); attorney general, Gail L. Ireland (R.); superintendent of public instruction, Mrs. Inez Johnson Lewis (D.). In 1940 the state cast 278,855 votes for Willkie, 265,364 for Roosevelt. The state property tax was reduced from 4.35 mills to 4.25 in 1941. Robert F. Rockwell, Republican, was elected to succeed Edward T. Taylor, deceased, as congressman from the Fourth Colorado district. United States Senator Alva B. Adams, Democrat, died, and Governor Carr appointed Eugene D. Millikin, Republican, to serve until the next general election. In 1939 Colorado had four Democratic representatives and two Democratic senators. In 1941 it had one Democratic representative and one Democratic senator.

Chief Justice Francis E. Bouck of the Colorado supreme court, Democrat, died, and the governor appointed William S. Jackson, Republican, to serve until the next general election.

Education.—There were 171,508 elementary pupils in 1941 enrolled in 2,365 schools, with 5,722 teachers, and 55,564 pupils enrolled in 491 secondary schools, with 3,447 teachers. Eight state educational institutions had a total enrolment of 9,136, and teaching staffs of 781; total annual disbursements, $3,744,000. State university enrolment, 4,053; teaching staff, 312; three teachers' colleges had a total enrolment of 2,050 and teaching staffs of 233.

Public Welfare, Charities, Corrections.—Public welfare disbursements, including $9,115,000 federal grants, $21,410,000. Pensions: 42,434 persons over 60, $15,926,000; dependent children, 15,008, $1,581,000; blind, 602, $163,000; direct relief, 14,163, $1,927,000; child welfare, 848, $37,000; tuberculosis, 133, $52,000. Unemployment insurance: 136,734 insured in 1940; 395,398 checks totalling $4,176,000 in benefits. Four correctional institutions, with 2,124 inmates; annual disbursements, $961,840. Eight charitable institutions, with 5,446 inmates; annual disbursements, $2,136,000.

Communications.—State highway system, including 3,976 mi. federal aid, totals 12,202 mi.; county roads, 65,130 mi. Thirty railroads had 4,870 mi. of main line track. There were 31 airports and landing fields, and 1,300 licensed pilots, including federal air school. Number of telephones, 233,669.

Banking and Finance.—There were 78 national and 66 state banks; total deposits, $343,280,816; assets, $379,735,799; 55 savings, building and loan associations, with assets of $35,114,832. Biennial state budget, $120,967,319. Outstanding state bonds, $2,539,000 net; highway anticipation warrants, $21,185,000 net.

Agriculture.—Farm crops harvested from 5,559,000 ac. in 1940 were valued at $72,784,000, compared with 5,045,000 ac. and $69,890,000 in 1939. Total 1940 farm income, including $10,112,000 government payments, $141,904,000. Climatic conditions generally were favourable in 1940, with above-average precipitation and irrigation water supplies.

Table I.—*Leading Agricultural Products of Colorado, 1940 and 1939*

Crop	Unit	1940	1939
Wheat	bu.	13,560,000	12,965,000
Corn	"	10,656,000	8,043,000
Barley	"	9,368,000	7,056,000
Oats	"	4,530,000	4,205,000
Dry beans	ton	88,000	71,000
Sugar beets	"	2,034,000	1,543,000
Hay	"	1,050,000	1,817,000
Potatoes	bu.	15,210,000	14,400,000
Grain sorghums	"	5,000,000	2,363,000

Manufacturing.—Total value of products manufactured in 1939 was $221,642,666, compared with $237,838,370 in 1937. Persons employed, 27,893 in 1939; 31,129 in 1937. Wages and salaries, $37,509,961 in 1939; $42,052,535 in 1937.

Table II.—*Principal Industries of Colorado, 1939 and 1937*

INDUSTRY	Value of Products	
	1939	1937
Meat packing	$33,005,533	$39,805,939
Bakery products	8,422,889	11,844,068
Butter	6,627,153	8,394,917
Newspaper and publishing	9,567,285	9,471,535
Flour, etc.	6,916,494	10,229,567

Mineral Production.—Production of all minerals in 1939 was valued at $64,071,621; 1938, $60,369,440. Production of all minerals remained fairly consistent in comparison with recent years.

Table III.—*Principal Mineral Products of Colorado, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Gold	$12,839,820	$12,861,380
Coal	14,548,000	14,828,000
Silver	5,767,313	5,127,819
Copper	2,748,720	2,777,516
Clay	1,838,371	1,285,801
Petroleum	1,330,000	1,540,000
Stone	1,040,579	1,051,333

(E.D.F.)

Colour Photography: *see* PHOTOGRAPHY.

Columbia, District of: *see* WASHINGTON, D.C.

Columbia University. An institution of higher learning in New York city. In 1940–41 the university had a registration of 30,197 resident students, including 10,568 students in the summer session of 1940; there were 9,150 students in the summer session of 1941. The total number of officers of administration and instruction was 3,289. The number of buildings on the campus at Morningside Heights was 70. In 1941 the university capital endowment was $89,050,717.20 and the total resources were $157,063,975.49. The budget appropriation for 1940–41 was $14,866,981.47. The library numbered 1,763,855 volumes. A ten-day conference of the International Labour organization (*q.v.*), a division of the League of Nations, was held at Columbia in the fall of 1941. At the end of 1941 the university was engaged in a revision of its schedules and curriculum in various schools to enable students to complete their courses in a shorter time. (M. H. T.)

Columbium. The production of columbite in Nigeria was 396 long tons in 1940, of which 250 tons was exported to the United States. Mining was discontinued during the year, and shipments were made from stocks amounting to 5,378 tons as of Sept. 30, 1940. Reserves of unmined columbite were estimated at 20,000 tons. Imports of columbium ores into the United States in 1940 were 595,220 lb., mostly from Nigeria. (G. A. Ro.)

Commerce, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Commerce Commission, Interstate: *see* INTERSTATE COMMERCE COMMISSION.

Committee for Industrial Organization: *see* CONGRESS OF INDUSTRIAL ORGANIZATIONS.

Commodity Credit Corporation. Commodity Credit corporation was created as an agency of the United States government pursuant to the provisions of the National Industrial Recovery act, under the president's executive order 6340, Oct. 16, 1933, under the laws of the state of Delaware. Under the president's reorganization order, effective July 1, 1939, the corporation functions as a part of the U.S. department of agriculture. The corporation is authorized to issue and have outstanding at any one time bonds, notes, debentures and other similar obligations not to exceed $2,650,000,000. These obligations are fully and unconditionally guaranteed by the United States. The corporation has been continued as an agency of the United States until June 30, 1943, or such earlier date as may be determined by the president.

Primarily a lending institution, Commodity Credit corporation utilizes its funds to support farm prices and enable the orderly marketing of agricultural commodities. Non-recourse loans to producers have been made on the following commodities: cotton, corn, wheat, tobacco, turpentine and rosin, rice, butter, dates, figs, hops, mohair, peanuts, pecans, prunes, raisins, rye, grain sorghum and wool. While loans are made principally to individual producers, co-operative marketing associations may also secure commodity loans under certain programs to facilitate marketing. All loans are made on the security of warehouse receipts for the collateral, with the exception of loans made on grain stored on the farm, in which case chattel mortgages are accepted to secure the collateral. Although loans may be made directly through the Commodity Credit corporation, more than 90% are made through banks and other approved lending agencies, and all notes bear interest at the rate of 3% per annum, of which 1½% is collected by the lending agency for the period of its investment.

Table I.—*Loans by Commodity Credit Corporation, Oct. 31, 1941*

Commodity	Commodity loans held by CCC	Commodity loans held by banks	Total commodity loans outstanding	Total quantities of commodities held as collateral
Barley	$ 336,000	$ 5,471,000	$ 5,807,000	14,903,000 bu.
Corn	105,493,000	36,173,000	141,666,000	215,669,000 bu.
Cotton	17,611,000	5,996,000	23,607,000	323,000 bales
Flaxseed	21,000	585,000	606,000	361,000 bu.
Grain sorghums	..	1,000	1,000	3,000 bu.
Prunes	3,942,000	..	3,942,000	78,000 tons
Rye	465,000	733,000	1,198,000	2,595,000 bu.
Tobacco	13,500,000	..	13,500,000	90,421,000 lb.
Turpentine and rosin	10,869,000	..	10,869,000	940,000 bbl. rosin 596,000 gal. turp.
Wheat	22,171,000	274,103,000	296,274,000	301,165,000 bu.
Total commodity loans	$174,408,000	$323,062,000	$497,470,000	

Loan rates on 1941 crops of cotton, corn, wheat, rice and tobacco were made at 85% of parity, as directed by Public Law 74, enacted May 26, 1941. (Parity, generally speaking, is defined as the price of the commodity that would give the farmer a purchasing power equivalent to the purchasing power of the same commodity unit in a base period, usually the 5-yr. period 1910–14.) In addition, the corporation approved programs for the purchase of certain commodities. An option to repurchase is usually granted for a limited period. Commodities purchased under these arrangements include tobacco, rice, dairy products, seed for conservation projects and certain general foodstuffs.

Reserves of food, feed and fibre stored in times of abundance under commodity programs were available for distribution in 1941. Lend-lease requirements for cotton, corn, tobacco, wheat and naval stores were supplied from stocks accumulated through loans and purchases, and corn reserves accumulated in years of surplus harvest provided additional food supplies required for the planned expansion of pork, dairy and poultry products in the United States. Stocks of all major commodities, acquired under previous programs, were reduced during 1941. In addition to sales by CCC, substantial quantities of commodities, particularly cotton and wheat, pledged for loans in 1940, were redeemed in 1941 and sold by producers.

Commodity credit loans and purchases during the fiscal year ending June 30, 1941, were the largest in any one year since the inception of the organization, and amounted to approximately $513,000,000, an increase of $117,000,000 over the previous year.

Table II.—*Commodities Owned by Commodity Credit Corporation, Oct. 31, 1941*

Commodity	Quantity	Book value
Barley	57,000 bu.	$ 28,000
Corn	161,329,000 bu.	118,801,000
Cotton, 1934–35	1,321,000 bales	94,374,000
Cotton, 1937–38	4,699,000 bales	230,433,000
Rubber	91,000 tons*	34,498,000
Rye	1,034,000 bu.	648,000
Tobacco	304,139,000 lb.	79,229,000
Wheat	173,010,000 bu.	163,306,000
Dairy products	..	1,444,000
Other commodities	..	106,927,000
		$829,688,000

*This rubber was acquired in the barter of cotton for rubber initiated in 1939 with the United Kingdom and is held as a defense reserve.

(J. B. Hu.)

Commodity Prices: *see* AGRICULTURE: *Prices;* BUSINESS REVIEW: *Commodity Prices;* PRICES.

Commons, Members of House of: *see* PARLIAMENT, HOUSES OF.

Commonwealth Fund, The. This endowment, established in 1918 by Mrs. Stephen V. Harkness "to do something for the welfare of mankind," and later increased by gifts from the founder and from Edward S. Harkness, president of the fund from its inception until his death on Jan. 29, 1940, amounted in 1941 to approximately $49,000,000. In the year ending Sept. 30, 1941 the fund appropriated some $1,800,000. Of this total more than half was devoted to the promotion and maintenance of physical health. Sums amounting to $550,000 were set aside for philanthropic needs arising out of the war.

Public health activities, designed to raise standards of rural service, centred in Tennessee, Mississippi, Oklahoma and Alabama. The 13th in a group of rural community hospitals built or remodelled with aid from the fund was completed in 1941; one more was under way. Some $366,000 was given for medical research. The Commonwealth fund fellowships for British graduate students at American universities were suspended, but grants were made to assist the research of several British scientists in the United States. The fund continued to aid child guidance enterprises in England; maintained an advisory service for community mental hygiene clinics in the United States; supported studies in administrative law and legal history and published during the year eight books and pamphlets of educational significance in its fields of operation. The directors of the fund were in 1941 Malcolm P. Aldrich, president; Phil W. Bunnell, Samuel

H. Fisher, George Welwood Murray, Dean Sage and William E. Stevenson. (B. C. S.)

Communications Commission, Federal: *see* FEDERAL COMMUNICATIONS COMMISSION.

Communism, or revolutionary Marxism, is a system of government evolved under the leadership of Lenin and Stalin in the soviet union. Communism believes in the dictatorship of the proletariat for a transitional period, after which a free society would come into existence in which everybody would contribute to the common weal according to his capacities, and receive a reward according to his need. This ultimate goal seemed in 1941 still very far away in the soviet union; meanwhile the soviet union represented a dictatorship of the Communist party with state ownership of all the important means of production. Communism proclaims the equality of all peoples and races and believes in the final establishment of a peaceful international order. Within this general frame communist policy has undergone several fundamental and sometimes sudden changes since 1920. One occurred in Aug. 1939, when the soviet union, and with it all the communist parties throughout the world, abandoned the principle of collaboration with the democratic nations in the struggle against fascism, and lined up side by side with aggressive fascism which communists had proclaimed until then the mortal enemy of the proletariat, of peace and of progress. Since then, and during 1940, the Communist party everywhere played a rather enigmatic and ambiguous role; nevertheless it directed all its main attacks against democracy, against Great Britain's effort to resist fascist aggression, and against the defense program of other democracies, including the United States, to prepare themselves against similar fascist aggression.

This development could be explained by the fact which had been visible already in the preceding years, that communism had abandoned more and more its original emphasis on internationalism, and that with Stalin and his generation the emphasis had shifted to the "socialist fatherland," even to the degree that Russian nationalism was revived and the Russian past rehabilitated against the original interpretation of Marxist critics. During the first part of 1941 communism continued to pursue a policy of neutrality and isolationism. For the first part of 1941 the line of 1940 was not changed. On Feb. 15 the Communist party of the soviet union assembled in Moscow for its 18th conference, having not met for two years, and stressed there the need of a greater efficiency of the party bureaucracy in all fields of Russian economic and military endeavour. Probably it was in the same spirit that externally a profound change was made in the position of the leader of communism, Joseph Stalin (*q.v.*), who so far had been only the secretary-general of the Communist party in the soviet union, and who became now, while retaining his former post, for the first time an official of the soviet government, namely chairman of the Council of People's Commissars, while the former chairman, V. M. Molotov, became vice-premier. As in 1940, little authentic news came out of the soviet union. A strict censorship was maintained, the activities of foreign correspondents were severely curtailed, and visits to the soviet union from abroad practically ceased. Nevertheless, it was the general conviction, that Stalin carried out his obligations under the pact of friendship with national socialist Germany as faithfully as did the Communist parties in Great Britain and the United States. The latter tried to impede all national defense efforts and agitated violently in America against help to Great Britain and against any United States participation in a war which they then regarded as being of no concern to mankind or to the United States.

This attitude was completely changed by the events of June 22, 1941 when the German armies, without the slightest warning or declaration of war, suddenly attacked the soviet union and crossed its borders. The shift in the communist policy, both in the soviet union and abroad, was as sudden and complete as it had been in Aug. 1939. From that moment on, the soviet union waged a bitter war against fascist aggression, and the Communist parties everywhere supported faithfully the war. The communists in the United States abandoned isolationism, recognized the war as a conflict which threatened the liberty and dignity of men everywhere, and demanded full help not only for the soviet union but for all nations resisting fascist aggression. Stalin in his speech of July 3, 1941, after a rather futile and unconvincing effort to defend the policy of isolationism and neutrality, came out with a patriotic appeal to defend the territory of the soviet union against aggression and proclaimed that "our war for the freedom of our country will merge with the struggle of the peoples of Europe and America for their independence, for democratic liberties." The national socialist government tried to proclaim its war for the conquest of eastern European territory, an often expressed wish of German expansionists, as a crusade on behalf of European civilization and of Christianity against godless and barbaric communism. Hitler's expectation of finding a ready echo for this interpretation of his attack against the soviet union, after two years of studied silence about the dangers of communism and of emphasized friendliness toward the soviet union, was not borne out. The governments and the large majority of the democratic nations, though maintaining their uncompromising antagonism to communism, regarded the military forces and the people of the soviet union as united with them in a common effort to defend all peoples against subjugation by Germany and Japan and inclusion into the national socialist world order. Fascist forces might have hoped that the Roman Catholic church which had often emphasized its hostility toward communism would support Chancellor Hitler as a Christian crusader, but the solemn allocution of Pope Pius XII on June 29 dispelled these hopes. When on Nov. 25, the fifth anniversary of the signing of the first anti-comintern pact between Germany and Japan, Chancellor Hitler convoked all governments under his and Japanese influence to Berlin to sign a new anti-comintern pact, none even of the few remaining independent nations of Europe appeared. Meanwhile the German armies, supported by satellite forces of Italy, Hungary, Rumania, Slovakia and Finland, had made great progress in the war, occupied large and important parts of the soviet union and destroyed many resources and industries which had supplied the soviet armies. Nevertheless, not only did the Russian armies show an unexpected force of resistance and courage, and thus were the first army met by the Germans on land with a similar determination to fight as that possessed by the Germans themselves, but the soviet government showed, in spite of defeats and retreat, a rare power of cohesion and of survival.

On the 24th anniversary of the communist revolution in Russia, on Nov. 6, 1941, Stalin delivered an address to the people of the soviet union in which he appealed to the "great Russian nation, the nation of . . . Pushkin, Tolstoy, Glinka and Tschaikovsky. . . . as distinct from Hitlerite Germany, the soviet union and its allies are waging a war of liberation—a just war calculated for the liberation of the enslaved peoples of Europe and of the soviet union from Hitler's tyranny." This speech by Stalin may be regarded as the keynote of communist policy, in the soviet union and abroad, in the second half of 1941.

Communist parties in countries under fascist influence were outlawed. In democratic countries their activities were allowed, but the British government suspended the publication of the two communist main organs, the *Daily Worker* and the *Week*, a mimeographed news letter, on Jan. 21, 1941, because, as the government

declared, they had systematically published matter "calculated to foment opposition to the prosecution of the war to a successful issue." In none of the democratic countries was communist influence or membership on the increase. Though after June 22, 1941 the Communist parties sought to co-operate with the democratic governments in the defense against fascist aggression, their co-operation was accepted only with reservations and without in the slightest degree implying that any compromise with communist ideology or tactics would be made. In China, where the Communist party had co-operated with Chiang Kai-shek's government against Japanese aggression, the relations between the government and the Chinese communists became more and more strained during 1941. (*See* also DEMOCRACY; FASCISM; PACIFISM; SOCIALISM.)

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Communist Party: *see* COMMUNISM.

Community Chest, a term which describes a local co-operative organization of U.S. citizens and social welfare agencies. Also known in some localities as "welfare federation," "community fund," "united fund" etc., the community chest has two general functions: (1) to raise funds each year by a community-wide appeal for all its affiliated, voluntary social and health agencies and to distribute those funds according to need by a budget procedure; and (2) to promote the social welfare and health of the community by co-ordinating services, improving standards, studying local problems and developing better public understanding. Closely allied with the community chest, more in social planning than in the fund-raising operation, is the council of social agencies.

In support of private social and health work for 1941, community chests raised $90,587,589 in 598 campaigns, which is an increase of $4,290,521 more than the 1940 totals. The general trend in community chest giving has been upward since 1935. The average per capita raised for 1941 by 118 chests which were included in a special study was $1.83. Approximately 20 out of every 100 persons in these 118 cities subscribed to the community chest in 1941, 41% more than in 1929 and an increase of 9.6% over 1940.

A special activity in which chest-supported voluntary social agencies and councils of social agencies were widely involved during 1941 arose from co-operation with selective service boards, in helping to investigate deferment claims, in following up cases of need for health or other service revealed by conscription investigations, etc. Councils of social agencies in many communities, through their member agencies, organized facilities to give information, entertainment, health, housing and other services to men in the armed forces.

In 1941 there were 598 community chests in existence, 575 of them in continental United States, one in the Virgin islands, two in Hawaii, 18 in Canada and two in South Africa. Almost every city in the United States with more than 100,000 population had a community chest or similar plan of federated financing for its voluntary social services.

Community Chests and Councils, Inc., 155 East 44th st., New York city, the national organization of community chests and councils of social agencies, was organized in 1918 as a clearing house for information for the 21 chests then organized. In 1941 the number of chests and councils affiliated on a voluntary membership basis was nearing 400. A board of directors and an executive committee composed of laymen and executives of local member chests and councils guides the organization's policies, and dues of member agencies finance the association. Community Chests and Councils, Inc., administers the annual Community Mobilization for Human Needs, sponsored by 36 co-operating national social agencies, and gives nationwide backing to local campaigns for funds for voluntary social work.

Officers for 1941–42 were: Robert Cutler, president; John Stewart Bryan, vice-president; Kenneth Sturges, vice-president; J. Herbert Case, treasurer; Lynn Mowat, secretary. Allen T. Burns was executive vice-president. (*See* also RELIEF.)

(A. T. B.)

Community Trusts. Philanthropic distribution in 1940 by 76 community trusts and foundations in continental United States, Canada and Hawaii totalled $2,225,000, compared with $1,278,000 during 1939. This disbursement was more than 25% in excess of that made in any year since the founding of the first community trust in Cleveland, O., on Jan. 2, 1914.

The aggregate principal funds of these foundations rose from $36,000,000 in 1930 to $40,000,000 in 1934, $50,000,000 in 1939 and $52,500,000 at the close of 1940.

The New York Community trust held the largest amount of principal funds, $9,409,021, followed by the Chicago Community trust with $9,126,048, the Cleveland foundation with $6,745,785, the Permanent Charity fund, Boston, with $5,535,761 and the Winnipeg foundation with $3,422,191. Other community trusts in Indianapolis, Minneapolis, Richmond, Philadelphia, Los Angeles and Buffalo held resources in excess of $1,000,000. (R. Hs.)

Composers, Authors and Publishers, American Society of: *see* PERFORMING RIGHT SOCIETIES; MUSIC: *Popular*.
Confectionery: *see* CANDY.
Congo, Belgian: *see* BELGIAN COLONIAL EMPIRE; BELGIUM.

Congregational Christian Churches. The Congregational Christian churches in the United States numbered 6,006 in 1941. This showed a loss of 35 congregations. Members numbered 1,058,807, a gain of 9,232 over the total of 1940. This loss in number of congregations with an increase in the total membership illustrated the trend toward fewer but larger churches, which had continued for some years. Many small churches were being merged with neighbouring churches; and this strengthening of the remaining churches stimulated renewed activity and growth.

The churches reported 3,730 young people's societies, a gain of 29, with a total membership of 195,585, a gain of 4,015. A total number of 3,195 churches kept record of church attendance; and these figures show that there had been an increase during 1941 in the average Sunday attendance of the churches keeping records. The list of ministers totalled 8,551, of whom 3,380 were pastors of churches; 125 missionaries; 286 educators and the rest in various kinds of religious and social work. Pastors' salaries showed a slight increase. The average salary of all ministers—and this of course includes the salary of many home missionary pastors as well as pastors of larger churches—was $1,774.

During the year the churches received 434 legacies, the total amount so bequeathed being $1,285,903. To all benevolences the churches gave $2,023,350, an increase of $114,911 over the preceding year.

The Congregational churches are not creedal churches; that is, they do not require assent to a creed for church membership. Church membership is based on a covenant, a simple statement of purpose; and Congregational churches receive as new members those who are willing to accept the covenant of the church and agree to live according to its purposes. This basis of church mem-

Principal Locations of Congregational Churches and Membership

Countries	Places of Service	Members of Churches	Countries	Places of Service	Members of Churches
Africa	2,427	114,992	Japan, The Kumiai Christian Church	204	33,523
Argentina	43	2,933	Madagascar (1939)†	1,045	39,462
Australia and New Zealand	472	21,336	Mexico‡	26	378
Brazil (1937)	53	6,349	Near East‡	124	5,073
British Guiana*	48	5,187	Newfoundland (1939)*	6	372
Bulgaria (1938)	28	890	Papua (1939)†	97	2,119
Canada, The United Church	7,389	711,712	Philippines‡	137	8,715
China, The Church of Christ (1938)	2,481	128,496	Poland	..	..
Czechoslovakia (1938)	36	4,322	Scotland	169	39,788
England and Wales (1939)	4,457	416,442	South Sea Islands (1939)†	146	10,715
India and Ceylon	1,718	54,226	Spain	..	..
Ireland	43	2,078	Sweden (1939)	2,256	100,615
Jamaica*	56	2,521	United States, including Hawaii	6,006	1,058,807
			TOTAL	29,467	2,780,051

*Colonial Missionary Society; †London Missionary Society; ‡American Board of Commissioners for Foreign Missions.

bership means that people with various religious backgrounds and with different shades of thought about religious teaching can unite together in Christian fellowship. No member is ever told what he must believe to be a good church member. As long as he shares the common purpose he is accepted as a member of the church.

The Congregational churches in America began with the arrival of the Pilgrims at Plymouth, Mass., in 1620. The name "Congregational" indicates that the congregation is the final authority. Each individual church through the action of its members calls its own minister, plans its own program, regulates its own finances, determines its own policies.

In accordance with the principle of fellowship, the churches maintain simple organizations for fellowship and administration but never for legislation. The churches of a county or a small geographical area are grouped in associations; the churches of a state, into state conferences, each of which has a superintendent and in larger states a considerable staff. The churches of the nation are united in the official national organization—The General Council of the Congregational Christian Churches. This national organization maintains a national office at 287 Fourth ave., New York city. The International Council of Congregational Churches includes churches in the countries shown in the table; the world office is the Memorial hall, Farringdon st., E.C.4, London, England. (F. L. F.)

Congress, United States.

The 77th U. S. Congress met for its second session Jan. 5, 1942. It comprised the following members (as of Jan. 14, 1942):

United States Senate

Presiding Officer: Henry A. Wallace, Vice-President of the United States

Majority Leader: Alben W. Barkley, of Kentucky

Minority Leader: Charles L. McNary, of Oregon

State	Name	Party	Term Expires	Residence
Ala.	Bankhead, John H.	Dem.	1943	Jasper
	Hill, Lister	Dem.	1945	Montgomery
Ariz.	McFarland, Ernest W.	Dem.	1947	Florence
	Hayden, Carl	Dem.	1945	Phoenix
Ark.	Caraway, Hattie W.	Dem.	1945	Jonesboro
	Spencer, Lloyd[1]	Dem.	1943	Hope
Calif.	Johnson, Hiram W.	Rep.	1947	San Francisco
	Downey, Sheridan	Dem.	1945	Atherton
Colo.	Millikin, Eugene D.[2]	Rep.	1945	Denver
	Johnson, Edwin C.	Dem.	1943	Denver
Conn.	Danaher, John A.	Rep.	1945	Hartford
	Maloney, Francis T.	Dem.	1947	Meriden
Del.	Tunnell, James M.	Dem.	1947	Georgetown
	Hughes, James H.	Dem.	1943	Dover
Fla.	Pepper, Claude	Dem.	1945	Tallahassee
	Andrews, Charles O.	Dem.	1947	Orlando
Ga.	George, Walter F.	Dem.	1945	Vienna
	Russell, Richard B., Jr.	Dem.	1943	Winder
Ida.	Thomas, John	Rep.	1943	Gooding
	Clark, D. Worth	Dem.	1945	Pocatello
Ill.	Brooks, C. Wayland	Rep.	1943	Chicago
	Lucas, Scott W.	Dem.	1945	Havana
Ind.	Van Nuys, Frederick	Dem.	1945	Indianapolis
	Willis, Raymond E.	Rep.	1947	Angola
Iowa	Gillette, Guy M.	Dem.	1945	Cherokee
	Herring, Clyde La V.	Dem.	1943	Des Moines
Kan.	Capper, Arthur	Rep.	1943	Topeka
	Reed, Clyde M.	Rep.	1945	Parsons
Ky.	Barkley, Alben W.	Dem.	1945	Paducah
	Chandler, A. B.	Dem.	1943	Versailles
La.	Overton, John H.	Dem.	1945	Alexandria
	Ellender, Allen J.	Dem.	1943	Houma
Me.	Brewster, Ralph O.	Rep.	1947	Dexter
	White, Wallace H., Jr.	Rep.	1943	Auburn
Md.	Tydings, Millard E.	Dem.	1945	Havre de Grace
	Radcliffe, George L.	Dem.	1947	Baltimore
Mass.	Walsh, David I.	Dem.	1947	Clinton
	Lodge, Henry C., Jr.	Rep.	1943	Beverly
Mich.	Vandenberg, Arthur H.	Rep.	1947	Grand Rapids
	Brown, Prentiss M.	Dem.	1943	St. Ignace
Minn.	Shipstead, Henrik	Rep.	1947	Miltona
	Ball, Joseph H.	Rep.	1943	St. Paul
Miss.	Doxey, Wall[3]	Dem.	1943	Holly Springs
	Bilbo, Theodore G.	Dem.	1947	Poplarville
Mo.	Clark, Bennett C.	Dem.	1945	St. Louis
	Truman, Harry S.	Dem.	1947	Independence
Mont.	Wheeler, Burton K.	Dem.	1947	Butte
	Murray, James E.	Dem.	1943	Butte
Neb.	Norris, George W.	Ind.	1943	McCook
	Butler, Hugh A.	Rep.	1947	Omaha
Nev.	Bunker, Berkeley L.	Dem.	1947	Las Vegas
	McCarran, Patrick A.	Dem.	1945	Reno
N.H.	Tobey, Charles W.	Rep.	1945	Temple
	Bridges, H. Styles	Rep.	1943	Concord
N.J.	Smathers, William H.	Dem.	1943	Margate City
	Barbour, W. Warren	Rep.	1947	Locust
N.M.	Hatch, Carl A.	Dem.	1943	Clovis
	Chavez, Dennis	Dem.	1947	Albuquerque
N.Y.	Mead, James M.	Dem.	1947	Buffalo
	Wagner, Robert F.	Dem.	1945	New York city
N.C.	Bailey, Josiah W.	Dem.	1943	Raleigh
	Reynolds, Robert R.	Dem.	1945	Asheville
N.D.	Langer, William	Rep.	1947	Bismarck
	Nye, Gerald P.	Rep.	1945	Cooperstown
Ohio	Taft, Robert A.	Rep.	1945	Cincinnati
	Burton, Harold H.	Rep.	1947	Cleveland
Okla.	Thomas, Elmer	Dem.	1945	Medicine Park
	Lee, Josh	Dem.	1943	Norman
Ore.	McNary, Charles L.	Rep.	1943	Salem
	Holman, Rufus C.	Rep.	1945	Portland
Pa.	Davis, James J.	Rep.	1945	Pittsburgh
	Guffey, Joseph F.	Dem.	1947	Pittsburgh
R.I.	Gerry, Peter G.	Dem.	1947	Warwick
	Green, Theodore F.	Dem.	1943	Providence
S.C.	Smith, Ellison DuR.	Dem.	1945	Lynchburg
	Maybank, Burnet R.[4]	Dem.	1943	Charleston
S.D.	Bulow, William J.	Dem.	1943	Beresford
	Gurney, Chan	Rep.	1945	Yankton
Tenn.	McKellar, Kenneth	Dem.	1947	Memphis
	Stewart, Tom	Dem.	1943	Winchester
Tex.	O'Daniel, W. Lee[5]	Dem.	1943	Ft. Worth
	Connally, Tom	Dem.	1947	Marlin
Utah	Murdock, Abe	Dem.	1947	Beaver
	Thomas, Elbert D.	Dem.	1945	Salt Lake City
Vt.	Austin, Warren R.	Rep.	1947	Burlington
	Aiken, George D.	Rep.	1945	Putney
Va.	Glass, Carter	Dem.	1943	Lynchburg
	Byrd, Harry F.	Dem.	1947	Berryville
Wash.	Bone, Homer T.	Dem.	1945	Tacoma
	Wallgren, Mon C.	Dem.	1947	Everett
W.Va.	Rosier, Joseph[6]	Dem.	1943	Fairmont
	Kilgore, Harley M.	Dem.	1947	Beckley
Wis.	LaFollette, Robert M., Jr.	Pro.	1947	Madison
	Wiley, Alexander	Rep.	1945	Chippewa Falls
Wyo.	O'Mahoney, Joseph C.	Dem.	1947	Cheyenne
	Schwartz, Harry H.	Dem.	1943	Casper

[1] Appointed April 1, 1941, to fill vacancy caused by resignation of John E. Miller, April 1, 1941.

[2] Appointed Dec. 20, 1941, to fill vacancy caused by death of Alva B. Adams, Dec. 1, 1941.

[3] Elected Sept. 23, 1941, to fill vacancy caused by death of Pat Harrison, June 22, 1941.

[4] Elected Sept. 16, 1941, to succeed Roger C. Peace, who was appointed Aug. 5, 1941, to fill vacancy caused by death of Alva M. Lumpkin, Aug. 1, 1941. Lumpkin was appointed to fill vacancy caused by appointment of James F. Byrnes to U. S. supreme court, effective July 8, 1941.

[5] Elected June 28, 1941, to fill vacancy caused by death of Morris Sheppard, April, 9, 1941.

[6] Appointed Jan. 13, 1941, to fill vacancy caused by resignation of Matthew M. Neely, Jan. 12, 1941.

United States House of Representatives (*served in 76th Congress)

Speaker: Sam Rayburn, of Texas

Majority Leader: John W. McCormack, of Massachusetts

Minority Leader: Joseph W. Martin, Jr., of Massachusetts

State	Dist.	Name	Party	Residence
Ala.	1	*Boykin, Frank W.	Dem.	Mobile
	2	*Grant, George M.	Dem.	Troy
	3	*Steagall, Henry B.	Dem.	Ozark
	4	*Hobbs, Sam	Dem.	Selma
	5	*Starnes, Joe	Dem.	Guntersville
	6	*Jarman, Pete	Dem.	Livingston
	7	Mancaso, Carter	Dem.	Jasper
	8	*Sparkman, John J.	Dem.	Huntsville
	9	*Patrick, Luther	Dem.	Birmingham
Ariz.		*Murdock, John R.	Dem.	Tempe
Ark.	1	*Gathings, E. C.	Dem.	West Memphis
	2	*Mills, Wilbur D.	Dem.	Kensett
	3	*Ellis, Clyde T.	Dem.	Bentonville
	4	*Cravens, Fadjo	Dem.	Fort Smith
	5	*Terry, David D.	Dem.	Little Rock
	6	*Norrel, W. F.	Dem.	Monticello
	7	Harris, Oren	Dem.	El Dorado
Calif.	1	*Lea, Clarence F.	Dem.	Santa Rosa
	2	*Englebright, Harry L.	Rep.	Nevada City
	3	*Buck, Frank H.	Dem.	Vacaville
	4	Rolph, Thomas	Rep.	San Francisco
	5	*Welch, Richard J.	Rep.	San Francisco
	6	*Carter, Albert E.	Rep.	Oakland
	7	*Tolan, John H.	Dem.	Oakland
	8	*Anderson, John Z.	Rep.	San Juan Bautista
	9	*Gearhart, Bertrand W.	Rep.	Fresno
	10	*Elliott, Albert J.	Dem.	Tulare
	11	*Hinshaw, Carl	Rep.	Pasadena
	12	*Voorhis, Jerry	Dem.	San Dimas
	13	*Kramer, Charles	Dem.	Los Angeles
	14	*Ford, Thomas F.	Dem.	Los Angeles
	15	*Costello, John M.	Dem.	Hollywood
	16	*Ford, Leland M.	Rep.	Santa Monica
	17	*Vacant*		
	18	Johnson, Ward	Rep.	Long Beach
	19	*Sheppard, Harry R.	Dem.	Yucaipa
	20	*Izac, Edouard V. M.	Dem.	San Diego
Colo.	1	*Lewis, Lawrence	Dem.	Denver
	2	Hill, William S.	Rep.	Fort Collins
	3	Chenoweth, J. Edgar	Rep.	Trinidad
	4	Rockwell, Robert F.	Rep.	Paonia
Conn.		Maciora, Lucien J.	Dem.	New Britain
	1	Kopplemann, Herman P.	Dem.	Hartford
	2	Fitzgerald, William J.	Dem.	Norwich
	3	*Shanley, James A.	Dem.	New Haven
	4	Downs, Le Roy D.	Dem.	South Norwalk
	5	*Vacant*		
Del.		Traynor, Philip A.	Dem.	Wilmington
Fla.	1	*Peterson, J. Hardin	Dem.	Lakeland
	2	*Green, Lex.	Dem.	Starke
	3	Sikes, Robert L. F.	Dem.	Crestview
	4	*Cannon, Pat	Dem.	Miami
	5	*Hendricks, Joe	Dem.	De Land
Ga	1	*Peterson, Hugh	Dem.	Ailey
	2	*Cox, Edward E.	Dem.	Camilla
	3	*Pace, Stephen	Dem.	Americus
	4	*Camp, Albert S.	Dem.	Newnan
	5	*Ramspeck, Robert	Dem.	Atlanta
	6	*Vinson, Carl	Dem.	Milledgeville
	7	*Tarver, Malcolm C.	Dem.	Dalton
	8	Gibson, John S.	Dem.	Douglas
	9	*Whelchel, B. Frank	Dem.	Gainesville
	10	*Brown, Paul	Dem.	Elberton
Ida.	1	*White, Compton I.	Dem.	Clark Fork
	2	*Dworshak, Henry C.	Rep.	Burley
Ill.		Stratton, William G.	Rep.	Morris
		Day, Stephen A.	Rep.	Evanston
	1	*Mitchell, Arthur W.	Dem.	Chicago
	2	*McKeough, Raymond S.	Dem.	Chicago
	3	*Kelly, Edward A.	Dem.	Chicago
	4	*Beam, Harry P.	Dem.	Chicago
	5	*Sabath, Adolph J.	Dem.	Chicago
	6	*Maciejewski, A. F.	Dem.	Chicago
	7	*Schuetz, Leonard W.	Dem.	Chicago
	8	*Kocialkowski, Leo	Dem.	Chicago
	9	Dewey, Charles S.	Rep.	Chicago
	10	Paddock, George A.	Rep.	Evanston
	11	*Reed, Chauncey W.	Rep.	West Chicago
	12	*Mason, Noah M.	Rep.	Oglesby
	13	*Allen, Leo E.	Rep.	Galena
	14	*Johnson, Anton J.	Rep.	Macomb
	15	*Chiperfield, Robert B.	Rep.	Canton
	16	*Dirksen, Everett McK.	Rep.	Pekin
	17	*Arends, Leslie C.	Rep.	Melvin
	18	*Sumner, Jessie	Rep.	Milford
	19	*Wheat, William H.	Rep.	Rantoul
	20	*Barnes, James M.	Dem.	Jacksonville
	21	Howell, Evan	Rep.	Springfield
	22	*Schaefer, Edwin M.	Dem.	Belleville
	23	*Arnold, Laurence F.	Dem.	Newton
	24	Heidinger, James V.	Rep.	Fairfield
	25	Bishop, C. W.	Rep.	Carterville
Ind.	1	*Schulte, William T.	Dem.	Hammond
	2	*Halleck, Charles A.	Rep.	Rensselaer
	3	*Grant, Robert A.	Rep.	South Bend
	4	*Gillie, George W.	Rep.	Fort Wayne
	5	*Harness, Forest A.	Rep.	Kokomo
	6	*Johnson, Noble J.	Rep.	Terre Haute

PRESIDENT ROOSEVELT addressing the joint session of congress Dec. 8, 1941, the day after the assault on Pearl Harbor. His request for a declaration of a state of war against Japan was approved by both houses 33 min. after he finished his message.

State	Dist.	Name	Party	Residence
Ind.	7	*Landis, Gerald W.	Rep.	Linton
	8	*Boehne, John W., Jr.	Dem.	Evansville
	9	Wilson, Earl	Rep.	Huron
	10	*Springer, Raymond S.	Rep.	Connersville
	11	*Larrabee, William H.	Dem.	New Palestine
	12	*Ludlow, Louis	Dem.	Indianapolis
Iowa	1	*Martin, Thomas E.	Rep.	Iowa City
	2	*Jacobsen, William S.	Dem.	Clinton
	3	*Gwynne, John W.	Rep.	Waterloo
	4	*Talle, Henry O.	Rep.	Decorah
	5	*LeCompte, Karl M.	Rep.	Corydon
	6	Cunningham, Paul	Rep.	Des Moines
	7	*Jensen, Ben F.	Rep.	Exira
	8	*Gilchrist, Fred C.	Rep.	Laurens
	9	*Harrington, Vincent F.	Dem.	Sioux City
Kan.	1	*Lambertson, William P.	Rep.	Fairview
	2	*Guyer, Ulysses S.	Rep.	Kansas City
	3	*Winter, Thomas D.	Rep.	Girard
	4	*Rees, Edward H.	Rep.	Emporia
	5	*Houston, John M.	Dem.	Wichita
	6	*Carlson, Frank	Rep.	Concordia
	7	*Hope, Clifford R.	Rep.	Garden City
Ky.	1	*Gregory, Noble J.	Dem.	Mayfield
	2	*Vincent, Beverly M.	Dem.	Brownsville
	3	*O'Neal, Emmet	Dem.	Louisville
	4	*Creal, Edward W.	Dem.	Hodgenville
	5	*Spence, Brent	Dem.	Fort Thomas
	6	*Chapman, Virgil	Dem.	Paris
	7	*May, Andrew J.	Dem.	Prestonsburg
	8	*Bates, Joe B.	Dem.	Greenup
	9	*Robsion, John M.	Rep.	Barbourville
La.	1	Hébert, F. Edward	Dem.	New Orleans
	2	Boggs, Hale	Dem.	New Orleans
	3	Domengeaux, James	Dem.	Lafayette
	4	*Brooks, Overton	Dem.	Shreveport
	5	*Mills, Newt V.	Dem.	Monroe
	6	Sanders, Jared Y., Jr.	Dem.	Baton Rouge
	7	Plauché, Vance	Dem.	Lake Charles
	8	*Allen, A. Leonard	Dem.	Winnfield
Me.	1	*Oliver, James C.	Rep.	South Portland
	2	*Smith, Margaret Chase	Rep.	Skowhegan
	3	Fellows, Frank	Rep.	Bangor
Md.	1	*Ward, David J.	Dem.	Salisbury
	2	*Cole, William P., Jr.	Dem.	Towson
	3	*D'Alesandro, Thomas, Jr.	Dem.	Baltimore
	4	Meyer, John A.	Dem.	Baltimore
	5	*Sasscer, Lansdale G.	Dem.	Upper Marlboro
	6	Byron, Katharine E.	Dem.	Williamsport
Mass.	1	*Treadway, Allen T.	Rep.	Stockbridge
	2	*Clason, Charles R.	Rep.	Springfield
	3	*Casey, Joseph E.	Dem.	Clinton
	4	*Holmes, Pehr G.	Rep.	Worcester
	5	*Rogers, Edith N.	Rep.	Lowell
	6	*Bates, George J.	Rep.	Salem
	7	Lane, Thomas J.	Dem.	Lawrence
	8	*Healey, Arthur D.	Dem.	Somerville
	9	Eliot, Thomas H.	Dem.	Cambridge
	10	*Tinkham, George H.	Rep.	Boston
	11	*Flaherty, Thomas A.	Dem.	Boston
	12	*McCormack, John W.	Dem.	Boston

State	Dist.	Name	Party	Residence
Mass.	13	*Wigglesworth, Richard B.	Rep.	Milton
	14	*Martin, Joseph W., Jr.	Rep.	North Attleboro
	15	*Gifford, Charles L.	Rep.	Barnstable
Mich.	1	*Tenerowicz, Rudolph G.	Dem.	Hamtramck
	2	*Michener, Earl C.	Rep.	Adrian
	3	*Shafer, Paul W.	Rep.	Battle Creek
	4	*Hoffman, Clare E.	Rep.	Allegan
	5	*Jonkman, Bartel J.	Rep.	Grand Rapids
	6	*Blackney, William W.	Rep.	Flint
	7	*Wolcott, Jesse P.	Rep.	Port Huron
	8	*Crawford, Fred L.	Rep.	Saginaw
	9	*Engel, Albert J.	Rep.	Muskegon
	10	*Woodruff, Roy O.	Rep.	Bay City
	11	*Bradley, Fred	Rep.	Rogers City
	12	*Hook, Frank E.	Dem.	Ironwood
	13	O'Brien, George D.	Dem.	Detroit
	14	*Rabaut, Louis C.	Dem.	Grosse Pointe Park
	15	*Dingell, John D.	Dem.	Detroit
	16	*Lesinski, John	Dem.	Dearborn
	17	*Dondero, George A.	Rep.	Royal Oak
Minn.	1	*Andresen, August H.	Rep.	Red Wing
	2	O'Hara, Joseph P.	Rep.	Glencoe
	3	Gale, Richard P.	Rep.	Mound
	4	*Maas, Melvin J.	Rep.	St. Paul
	5	*Youngdahl, Oscar	Rep.	Minneapolis
	6	*Knutson, Harold	Rep.	St. Cloud
	7	*Andersen, H. Carl	Rep.	Tyler
	8	*Pittenger, William A.	Rep.	Duluth
	9	*Buckler, Richard T.	F.L.	Crookston
Miss.	1	*Rankin, John E.	Dem.	Tupelo
	2	Whitten, Jamie L.	Dem.	Charleston
	3	*Whittington, William M.	Dem.	Greenwood
	4	*Ford, Aaron L.	Dem.	Ackerman
	5	*Collins, Ross A.	Dem.	Meridian
	6	*Colmer, William M.	Dem.	Pascagoula
	7	*McGehee, Dan R.	Dem.	Meadville
Mo.	1	*Romjue, Milton A.	Dem.	Macon
	2	*Nelson, William L.	Dem.	Columbia
	3	*Duncan, Richard M.	Dem.	St. Joseph
	4	*Bell, C. Jasper	Dem.	Blue Springs
	5	*Shannon, Joseph B.	Dem.	Kansas City
	6	Bennett, Philip A.	Rep.	Springfield
	7	*Short, Dewey	Rep.	Galena
	8	*Williams, Clyde	Dem.	Hillsboro
	9	*Cannon, Clarence	Dem.	Elsberry
	10	*Zimmerman, Orville	Dem.	Kennett
	11	Sullivan, John B.	Dem.	St. Louis
	12	Ploeser, Walter C.	Rep.	St. Louis
	13	*Cochran, John J.	Dem.	St. Louis
Mont.	1	Rankin, Jeannette	Rep.	Missoula
	2	*O'Connor, James F.	Dem.	Livingston
Neb.	1	Copeland, Oren S.	Rep.	Lincoln
	2	*McLaughlin, Charles F.	Dem.	Omaha
	3	*Stefan, Karl	Rep.	Norfolk
	4	*Curtis, Carl T.	Rep.	Minden
	5	*Coffee, Harry B.	Dem.	Chadron
Nev.		*Scrugham, James G	Dem.	Reno
N.H.	1	*Jenks, Arthur B.	Rep.	Manchester
	2	*Stearns, Foster	Rep.	Hancock
N.J.	1	*Wolverton, Charles A.	Rep.	Merchantville
	2	Wene, Elmer H.	Dem.	Vineland
	3	*Sutphin, William H.	Dem.	Matawan
	4	*Powers, D. Lane	Rep.	Trenton
	5	*Eaton, Charles A.	Rep.	Watchung
	6	*McLean, Donald H.	Rep.	Elizabeth
	7	*Thomas, J. Parnell	Rep.	Allendale
	8	Canfield, Gordon	Rep.	Paterson
	9	*Osmers, Frank C., Jr.	Rep.	Haworth
	10	*Hartley, Fred A., Jr.	Rep.	Kearny
	11	*Vreeland, Albert L.	Rep.	East Orange
	12	*Kean, Robert W.	Rep.	Livingston
	13	*Norton, Mary T.	Dem.	Jersey City
	14	*Hart, Edward J.	Dem.	Jersey City
N.M.		Anderson, Clinton P.	Dem.	Albuquerque
N.Y.		*Merritt, Matthew J.	Dem.	Flushing
		*O'Day, Caroline	Dem.	Rye
	1	*Hall, Leonard W.	Rep.	Oyster Bay
	2	*Barry, William B.	Dem.	Hollis
	3	*Pfeifer, Joseph L.	Dem.	Brooklyn
	4	*Cullen, Thomas H.	Dem.	Brooklyn
	5	Heffernan, James J.	Dem.	Brooklyn
	6	*Somers, Andrew L.	Dem.	Brooklyn
	7	*Delaney, John J.	Dem.	Brooklyn
	8	*O'Toole, Donald L.	Dem.	Brooklyn
	9	*Keogh, Eugene J.	Dem.	Brooklyn
	10	*Celler, Emanuel	Dem.	Brooklyn
	11	*O'Leary, James A.	Dem.	W. New Brighton
	12	*Dickstein, Samuel	Dem.	New York city
	13	Capozzoli, Louis J.	Dem.	New York city
	14	Klein, Arthur G.	Dem.	New York city
	15	*Kennedy, Michael J.	Dem.	New York city
	16	Pheiffer, William T.	Rep.	New York city
	17	Baldwin, Joseph C.	Rep.	New York city
	18	*Kennedy, Martin J.	Dem.	New York city
	19	*Bloom, Sol	Dem.	New York city
	20	*Marcantonio, Vito	Am.Lab.	New York city
	21	*Gavagan, Joseph A.	Dem.	New York city
	22	*Lynch, Walter A.	Dem.	Bronx
N.Y.	23	*Buckley, Charles A.	Dem.	Bronx
	24	*Fitzpatrick, James M.	Dem.	Bronx
	25	*Gamble, Ralph A.	Rep.	Larchmont
	26	*Fish, Hamilton	Rep.	Garrison
	27	*Rockefeller, Lewis K.	Rep.	Chatham
	28	*Byrne, William T.	Dem.	Loudonville
	29	*Cluett, E. Harold	Rep.	Troy
	30	*Crowther, Frank	Rep.	Schenectady
	31	*Kilburn, Clarence E.	Rep.	Malone
	32	*Culkin, Francis D.	Rep.	Oswego
	33	*Douglas, Fred J.	Rep.	Utica
	34	*Hall, Edwin A.	Rep.	Binghamton
	35	*Hancock, Clarence E.	Rep.	Syracuse
	36	*Taber, John	Rep.	Auburn
	37	*Cole, W. Sterling	Rep.	Bath
	38	*O'Brien, Joseph J.	Rep.	East Rochester
	39	*Wadsworth, James W.	Rep.	Geneseo
	40	*Andrews, Walter G.	Rep.	Buffalo
	41	Beiter, Alfred F.	Dem.	Williamsville
	42	Butler, John C.	Rep.	Buffalo
	43	*Reed, Daniel A.	Rep.	Dunkirk
N.C.	1	*Bonner, Herbert C.	Dem.	Washington
	2	*Kerr, John H.	Dem.	Warrenton
	3	*Barden, Graham A.	Dem.	New Bern
	4	*Cooley, Harold D.	Dem.	Nashville
	5	Folger, John H.	Dem.	Mount Airy
	6	*Durham, Carl T.	Dem.	Chapel Hill
	7	*Clark, J. Bayard	Dem.	Fayetteville
	8	*Burgin, William O.	Dem.	Lexington
	9	*Doughton, Robert L.	Dem.	Laurel Springs
	10	*Bulwinkle, Alfred L.	Dem.	Gastonia
	11	*Weaver, Zebulon	Dem.	Asheville
N.D.		*Burdick, Usher L.	Rep.	Williston
		Robertson, Charles R.	Rep.	Bismarck
Ohio		*Bender, George H.	Rep.	Cleveland Heights
		Young, Stephen M.	Dem.	Cleveland
	1	*Elston, Charles H.	Rep.	Newtown
	2	*Hess, William E.	Rep.	Cincinnati
	3	Holbrook, Greg	Dem.	Hamilton
	4	*Jones, Robert F.	Rep.	Lima
	5	*Clevenger, Cliff	Rep.	Bryan
	6	Davis, Jacob E.	Dem.	Waverly
	7	*Brown, Clarence J.	Rep.	Blanchester
	8	*Smith, Frederick C.	Rep.	Marion
	9	*Hunter, John F.	Dem.	Toledo
	10	*Jenkins, Thomas A.	Rep.	Ironton
	11	*Claypool, Harold K.	Dem.	Chillicothe
	12	*Vorys, John M.	Rep.	Columbus
	13	Baumhart, A. D., Jr.	Rep.	Vermilion
	14	*Harter, Dow W.	Dem.	Akron
	15	*Secrest, Robert T.	Dem.	Caldwell
	16	Thom, William R.	Dem.	Canton
	17	*McGregor, J. Harry	Rep.	West Lafayette
	18	Imhoff, Lawrence E.	Dem.	St. Clairsville
	19	*Kirwan, Michael J.	Dem.	Youngstown
	20	*Sweeney, Martin L.	Dem.	Cleveland
	21	*Crosser, Robert	Dem.	Cleveland
	22	*Bolton, Frances P.	Rep.	Cleveland
Okla.		*Rogers, Will	Dem.	Oklahoma City
	1	*Disney, Wesley E.	Dem.	Tulsa
	2	*Nichols, Jack	Dem.	Eufaula
	3	*Cartwright, Wilburn	Dem.	McAlester
	4	*Boren, Lyle H.	Dem.	Seminole
	5	*Monroney, Mike	Dem.	Oklahoma City
	6	*Johnson, Jed	Dem.	Anadarko
	7	Wickersham, Victor	Dem.	Mangum
	8	Rizley, Ross	Rep.	Guymon
Ore.	1	*Mott, James W.	Rep.	Salem
	2	*Pierce, Walter M.	Dem.	La Grande
	3	*Angell, Homer D.	Rep.	Portland
Pa.	1	*Sacks, Leon	Dem.	Philadelphia
	2	*McGranery, James P.	Dem.	Philadelphia
	3	*Bradley, Michael J.	Dem.	Philadelphia
	4	*Sheridan, John E.	Dem.	Philadelphia
	5	Smith, Francis R.	Dem.	Philadelphia
	6	*Myers, Francis J.	Dem.	Philadelphia
	7	Scott, Hugh D., Jr.	Rep.	Philadelphia
	8	*Wolfenden, James	Rep.	Upper Darby
	9	*Gerlach, Charles L.	Rep.	Allentown
	10	*Kinzer, J. Roland	Rep.	Lancaster
	11	*Boland, Patrick J.	Dem.	Scranton
	12	*Vacant*		
	13	*Fenton, Ivor D.	Rep.	Mahanoy City
	14	*Moser, Guy L.	Dem.	Douglassville
	15	Gillette, Wilson D.	Rep.	Towanda
	16	*Rich, Robert F.	Rep.	Woolrich
	17	*Ditter, J. William	Rep.	Ambler
	18	*Simpson, Richard M.	Rep.	Huntingdon
	19	*Kunkel, John C.	Rep.	Harrisburg
	20	*Jarrett, Benjamin	Rep.	Farrell
	21	*Walter, Francis E.	Dem.	Easton
	22	Haines, Harry L.	Dem.	Red Lion
	23	*Van Zandt, James E.	Rep.	Altoona
	24	*Snyder, J. Buell	Dem.	Perryopolis
	25	*Faddis, Charles I.	Dem.	Waynesburg
	26	*Graham, Louis E.	Rep.	Beaver
	27	*Tibbott, Harve	Rep.	Ebensburg
	28	Kelley, Augustine B.	Dem.	Greensburg

State	Dist.	Name	Party	Residence
Pa.	29	*Rodgers, Robert L.	Rep.	Erie
	30	Scanlon, Thomas E.	Dem.	Pittsburgh
	31	Weiss, Samuel A.	Dem.	Glassport
	32	*Eberharter, Herman P.	Dem.	Pittsburgh
	33	*Vacant*		
	34	Wright, James A.	Dem.	Carnegie
R.I.	1	Forand, Aime J.	Dem.	Central Falls
	2	Fogarty, John E.	Dem.	Harmony
S.C.	1	Rivers, L. Mendel	Dem.	Charleston
	2	*Fulmer, Hampton P.	Dem.	Orangeburg
	3	*Hare, Butler B.	Dem.	Saluda
	4	*Bryson, Joseph R.	Dem.	Greenville
	5	*Richards, James P.	Dem.	Lancaster
	6	*McMillan, John L.	Dem.	Florence
S.D.	1	*Mundt, Karl E.	Rep.	Madison
	2	*Case, Francis	Rep.	Custer
Tenn.	1	*Reece, B. Carroll	Rep.	Johnson City
	2	*Jennings, John, Jr.	Rep.	Knoxville
	3	*Kefauver, Estes	Dem.	Chattanooga
	4	*Gore, Albert	Dem.	Carthage
	5	Priest, J. Percy	Ind.Dem.	Nashville
	6	*Courtney, Wirt	Dem.	Franklin
	7	*Pearson, Herron	Dem.	Jackson
	8	*Cooper, Jere	Dem.	Dyersburg
	9	*Davis, Clifford	Dem.	Memphis
Tex.	1	*Patman, Wright	Dem.	Texarkana
	2	*Dies, Martin	Dem.	Orange
	3	*Beckworth, Lindley	Dem.	Gilmer
	4	*Rayburn, Sam	Dem.	Bonham
	5	*Sumners, Hatton W.	Dem.	Dallas
	6	*Johnson, Luther A.	Dem.	Corsicana
	7	*Patton, Nat	Dem.	Crockett
	8	*Thomas, Albert	Dem.	Houston
	9	*Mansfield, Joseph J.	Dem.	Columbus
	10	*Johnson, Lyndon	Dem.	Johnson City
	11	*Poage, William R.	Dem.	Waco
	12	*Lanham, Fritz G.	Dem.	Fort Worth
	13	*Gossett, Ed	Dem.	Wichita Falls
	14	*Kleberg, Richard M.	Dem.	Corpus Christi
	15	*West, Milton H.	Dem.	Brownsville
	16	*Thomason, R. Ewing	Dem.	El Paso
	17	Russell, Sam M.	Dem.	Stephenville
	18	Worley, Eugene	Dem.	Shamrock
	19	*Mahon, George H.	Dem.	Colorado
	20	*Kilday, Paul J.	Dem.	San Antonio
	21	*South, Charles L.	Dem.	Coleman
Utah	1	Granger, Walter K.	Dem.	Cedar City
	2	*Robinson, J. Will	Dem.	Provo
Vt.		*Plumley, Charles A.	Rep.	Northfield
Va.	1	*Bland, Schuyler O.	Dem.	Newport News
	2	Harris, Winder R.	Dem.	Norfolk
	3	*Satterfield, Dave E., Jr.	Dem.	Richmond
	4	*Drewry, Patrick H.	Dem.	Petersburg
	5	*Burch, Thomas G.	Dem.	Martinsville
	6	*Woodrum, Clifton A.	Dem.	Roanoke
	7	*Robertson, A. Willis	Dem.	Lexington
	8	*Smith, Howard W.	Dem.	Alexandria
	9	*Flannagan, John W., Jr.	Dem.	Bristol
Wash.	1	*Magnuson, Warren G.	Dem.	Seattle
	2	Jackson, Henry M.	Dem.	Everett
	3	*Smith, Martin F.	Dem.	Hoquiam
	4	*Hill, Knute	Dem.	Prosser
	5	*Leavy, Charles H.	Dem.	Spokane
	6	*Coffee, John M.	Dem.	Tacoma
W.Va.	1	Ramsay, Robert L.	Dem.	Follansbee
	2	*Randolph, Jennings	Dem.	Elkins
	3	*Edmiston, Andrew	Dem.	Weston
	4	*Johnson, George W.	Dem.	Parkersburg
	5	*Kee, John	Dem.	Bluefield
	6	*Smith, Joe L.	Dem.	Beckley
Wis.	1	Smith, Lawrence H.	Rep.	Racine
	2	Sauthoff, Harry	Pro.	Madison
	3	Stevenson, William H.	Rep.	La Crosse
	4	Wasielewski, Thad F.	Dem.	Milwaukee
	5	*Thill, Lewis D.	Rep.	Milwaukee
	6	*Keefe, Frank B.	Rep.	Oshkosh
	7	*Murray, Reid F.	Rep.	Ogdensburg
	8	*Johns, Joshua L.	Rep.	Algoma
	9	*Hull, Merlin	Pro.	Black River Falls
	10	*Gehrmann, Bernard J.	Pro.	Mellen
Wyo.		McIntyre, John J.	Dem.	Douglas

WHEN HE CHARGED that the North American Aviation strike at Inglewood, Calif. was inspired by communists, Richard T. Frankensteen, officer of the C.I.O., was booed off the platform by strikers June 8, 1941. The next day President Roosevelt called out the army to open the plant

Congress of Industrial Organizations.

Noteworthy among advances reported by the Congress of Industrial Organizations in 1941 was the organization of the employees of the Ford Motor company, the "Little Steel" companies (Bethlehem, Republic, Inland and Youngstown) and other big industrial corporations which previously had refused to enter into signed agreements with the CIO unions. The Ford company signed a union shop contract, hailed as one of the best to be won by the CIO, after its employees had voted by an overwhelming majority for the union in labour board elections.

The CIO also reported rapid strides in organizing the aircraft, machine manufacturing, shipbuilding and other defense industries; launched a major campaign in the oil industry, and resolved to make unionization of the south a major aim in 1942.

Notable wage improvements were won by the CIO in the coal industry, where the differential between southern and northern wages was abolished in the Appalachian agreement and the union shop established throughout the industry, in the steel industry and in all other organized industries.

To implement its support of the defense program, the CIO in 1941 promoted the Industry Council plan, drafted by President Philip Murray (*q.v.*), to increase production of armaments and domestic goods through industry councils, in which labour and industry should be equally represented, with a government representative as chairman. It applied the principles of this plan in detailed and practical proposals for industry-wide planning for increased production in the auto, aircraft, steel, aluminum, non-ferrous metals, longshore, farm equipment and other industries.

The CIO held its 1941 convention in Detroit in November, where it took a strong stand in favour of furnishing all possible aid to and co-operation with Great Britain, the soviet union and China in the struggle "to rid the world of Hitlerism, the enemy of mankind."

Immediately war was declared, all sections of the CIO pledged their complete support for the war effort. The CIO also participated in the labour-industry-government conference in Washington in December, at which an agreement was reached to prevent all strikes and lock-outs for the duration of the war and to set up governmental machinery for the peaceful adjustment of industrial disputes.

President Murray, Secretary James B. Carey and the six vice-presidents were re-elected at the Detroit convention.

First established in Nov. 1935 as the Committee for Industrial Organization, the CIO became established on a permanent basis at its first constitutional convention in Nov. 1938, where it adopted its present name. Its headquarters are at 1106 Connecticut ave., Washington, D.C. (*See* also AMERICAN FEDERATION OF LABOR; DEFENSE, NATIONAL [U. S.]; LABOUR UNIONS; STRIKES AND LOCK-OUTS; UNITED STATES.) (P. My.)

Connecticut. The most southwesterly of the New England states, and the fifth of the original states of the union to ratify the federal constitution, Connecticut is popularly known as the "Nutmeg state" and the "Land of Steady Habits"; land area, 4,899 sq.mi.; population (1940), 1,709,242, an increase of 6.4% over 1930. Capital, Hartford (166,267). Other cities

with more than 50,000 population in 1940: New Haven (160,605); Bridgeport (147,121); Waterbury (99,314); New Britain (68,685). Of the state's population in 1940, 1,158,162 were urban, or 67.8%. In 1940 there were 1,675,407 whites; 32,992 Negroes; 1,347,466 native born; 327,941 foreign born.

History.—The principal state officers in 1941 (for the term 1941–43) were: governor, Robert A. Hurley (Democrat); lieutenant governor, Odell Shepard; secretary of state, Mrs. Chase Going Woodhouse. The United States senators were John A. Danaher (term 1939–45), and Francis T. Maloney (term 1941–47). The general assembly of 1941 consisted of 22 Democrats, 13 Republicans in the senate; 88 Democrats, 184 Republicans in the house. The only elections in the state in 1941 were for town, city and other local officers; these showed no significant changes in the voting.

The biennial session of the general assembly initiated constitutional amendments to make sessions annual and to increase the terms of elective state officers to four years with elections in odd-numbered years. The common pleas courts were placed on a state, instead of local, basis and a state system of juvenile courts was created. A state council of defense (Samuel H. Fisher, administrator) was set up, and the state was authorized to purchase land to be leased to the federal government for an army air base at Windsor Locks. Provision was made for entering into an interstate sanitary compact with New York and New Jersey. Any state surplus in excess of $1,000,000 was to be applied to debt extinction. Solvency of the unemployment compensation was assured by a provision that the increased benefits and decreased taxes be conditioned on maintaining a reserve of $40,000,000.

Education and Charities. In 1939 40 the enrolment in 853 elementary schools and kindergartens was 187,482, with 5,807 teachers. In 36 junior high schools, with 617 teachers, there were 23,344 pupils enrolled; in 94 senior high schools, with 2,309 teachers, the enrolment was 79,654. State educational institutions are: the University of Connecticut at Storrs (enrolment in 1941, 1,648); Teachers' College of Connecticut at New Britain (489); state teachers' colleges at New Haven, Willimantic and Danbury; state trades schools in 11 cities (to be increased to 14), and various provisions for vocational schools and classes. The leading private institutions of collegiate rank in the state are: Yale university, New Haven; Wesleyan university, Middletown; Trinity college, Hartford; Hartford Seminary foundation, Hartford; Connecticut College for Women, New London; Albertus Magnus college, New Haven and St. Joseph's college, West Hartford.

In Sept. 1941 there were 3,968 on WPA pay rolls, receiving $293,418, while the state supplied general relief to 26,203 individuals, amounting to $354,812; it paid old age assistance to 17,594 persons, totalling $509,094; widows' aid to 3,983 ($51,585); blind aid to 272 ($6,890). Under unemployment compensation in the last week of Sept. 1941, 3,313 applicants were paid $35,816.

Communication.—In the first ten months of 1941 the number of car registrations and licensed operators each increased more than 10%, to 556,608 and 628,498 respectively. For 1940 Connecticut was rated by the National Safety council as the state with the best safety record. The state highway system in 1941 included 2,863 mi. of trunk-line and state-aid roads, and about 1,600 mi. of town-aid roads. During 1941 work was pushed forward rapidly on the Wilbur Cross highway, an extension of the Merritt parkway through Hartford to the Massachusetts line.

There were 889 mi. of railroads in 1941, of which 90% belonged to the New York, New Haven and Hartford system. There were 18 approved airports and six seaplane units. The number of telephones in service Oct. 31, 1941 was 415,584.

Banking and Finance.—On Sept. 30, 1941, the 72 mutual savings banks in the state had total deposits of $765,432,113 and total assets of $858,322,611; the number of accounts increased to 1,014,934. The 64 state banks and trust companies had total assets of $450,496,379. The 52 national banks on June 29, 1940 had total assets of $366,578,000, of which $322,314,000 represented deposits. Hartford is the headquarters of most of the 25 large insurance companies operating under Connecticut charters.

The state income for the fiscal year ended June 30, 1941 was $88,037,793 and the net expenditures were $68,857,263. On June 30, 1941 the state's bonded debt was $33,350,000, which was in process of steady liquidation.

Agriculture.—The census of 1940 showed 21,163 farms in the state, containing 1,512,151 ac. and valued (including buildings) at $204,761,302. Of the farm land, 642,070 ac. were considered available for crops. In spite of a serious shortage in rainfall, the agricultural production of the state in 1941 was above the average. The dairy industry accounted for nearly half the value of farm products; poultry raising increased rapidly to second place; potatoes and garden products came third; tobacco, with an unusually good crop, returned more than $23,000,000, a 20% increase over 1940; apples and other fruits ranked fifth. Considerable quantities of hay and corn are also grown.

Manufacturing.—The census report showed, in 1939, 2,936 manufacturing establishments in the state employing 233,525 wage earners paid $276,274,243 and turning out products valued at $1,229,585,773. By Aug. 1941 it was estimated that 315,000 workers were employed in Connecticut industries. In defense work Connecticut ranked first in 1941 among the states in the production of aeroplane motors and propellers, submarines and small arms ammunition. It is also a large producer of aircraft, guns, ammunition, machine tools, cloth for parachutes, uniforms and tents, cutlery, locks, raincoats, overshoes, pumps, springs and blankets. The value of the principal classes of output in 1939 was: nonferrous metal goods $229,612,108; hardware, iron and steel products $163,817,129; textiles $152,105,492; machinery and machine tools $141,454,627; electric equipment and appliances $102,761,408; clothing $63,438,618; foods and beverages $54,563,674; chemicals $52,694,483. (G. M. Du.)

Conrad, Frank (1874–1941), U.S. radio engineer, was born May 4 in Pittsburgh. In 1912 he became interested in wireless telephony and during World War I he devised the only aeroplane radio set that saw much action. After the war, he enlarged his homemade station, built in a garage, and began broadcasting phonograph records. The program became popular and soon stores started advertising receiving sets. Impressed by the success of his broadcasts, Conrad turned over the idea for commercial broadcasts to the Westinghouse Electric & Manufacturing company, which licensed station KDKA in Pittsburgh and thus launched commercial broadcasts. Conrad, who was assistant chief engineer of the Westinghouse company after 1921, died in Miami, Fla., Dec. 11.

Conscientious Objectors: *see* FRIENDS, RELIGIOUS SOCIETY OF; PACIFISM.

Conscription: *see* SELECTIVE SERVICE.

Conservation, Soil: *see* SOIL EROSION AND SOIL CONSERVATION.

Conservation Corps, Civil: *see* CIVILIAN CONSERVATION CORPS.

Conservative Party, Great Britain. For the fourth year in succession the National Union of Conservative and Unionist associations in England held no conference in 1941, but the party was active.

The report presented by the executive committee to the central council at their March meeting, after claiming that, unlike other parties, the Conservatives had suspended all propaganda since the outbreak of war, stated that their attitude was that, while changes in the social system might be desirable, the truce implied by the formation of a government representative of all parties should preclude attempts to advocate purely party policies. This recommendation was adopted, as also was an important resolution emphasizing the urgent need of the enlisting in the public services of younger persons of proved capacity, rather than those whose only quality was the mere possession of wealth or the backing of vested interests. These closely connected problems of attracting young candidates and eliminating the wealth factor, engaged the serious attention of the council during the year, and a further resolution was adopted in October, declaring that while the final choice of a candidate was a matter for local decision, approval might be withheld by the central organization if the choice had been affected by any financial offers made by the candidate. It was hoped that the adoption of this resolution would stop the tendency—in a minority of constituencies—to make wealth a qualification and would, at the same time, set a high standard to all political parties.

Lord Queenborough was re-elected president of the union, and Lt. Col. Sir Cuthbert Headlam, Bt., M.P., succeeded Lady Hillingdon as chairman. Sir Eugene Ramsden, Bt., M.P., was re-elected chairman of the executive committee. A special committee was set up to put before the prime minister its views on pensions, demobilization and resettlement, the future of the services and the mercantile marine, imperial and international relations, elec-

toral reform, education, housing, local government, agriculture and food production, industry and finance, and other problems that might be expected to present themselves after the war.

Erskine Hill, M.P., succeeded W. P. Spens, M.P., as chairman of the 1922 committee of Conservative private members, the most important of the unofficial committees of the house of commons, and the Rt. Hon. Sir Douglas Hacking, Bt., M.P., was appointed president of the National Society of Conservative and Unionist Agents. (L. H. D.)

Consumer Credit.

Consumer credit is extended through four general classes of institution: (1) cash-lending agencies, such as credit unions, industrial banking companies, small loan or personal finance companies, personal loan departments of commercial banks and pawnbrokers; (2) retail merchants, such as department, furniture, clothing and grocery stores, automobile and household appliance dealers, and jewellers; (3) service creditors, such as physicians and dentists, undertakers, public utility companies and laundries; and (4) intermediary financing agencies, such as sales finance companies and certain banks and manufacturers, which buy instalment sales contracts from retail merchants and dealers.

The total outstanding amount of consumer credit, exclusive of loans on real estate mortgages, which for a variety of reasons are usually treated separately, was estimated roughly at $9,200,000,000 at the close of 1940. Some 60% of this amount represented balances on instalment contracts. The remainder represented charge accounts and term credits. Table I gives estimates of instalment and of charge account and term credits by classes of credit-granting agencies.

Table I.—*Consumer Credit Balances at the Close of 1940*

(In millions of dollars)

Class of Agency	Instalment Credit	Charge Account and Term Credit
Cash-lending agencies	$1,590	$ 620
Retail merchants	1,454	2,386
Service creditors	66	492
Intermediary financing agencies	2,582	..
	$5,692	$3,498

Of the total amount of instalment sales credit-granting at the close of 1940—roughly $4,000,000,000—almost 45% arose out of sales of new and used automobiles. Household appliances accounted for some 18% of the total; furniture and pianos for about 14%; house fixtures and improvements for about 9%; and clothing for about 4%.

The outstanding amount of consumer credit fluctuates with the business cycle. But it grew substantially during the period for which estimates were available. Estimated outstandings increased from $4,300,000,000 at the close of 1923 to $8,200,000,000 at the close of 1929, declined to $4,600,000,000 in March 1933, rose to $8,500,000,000 in Aug. 1937. After a precipitate decline through 1938, expansion was renewed until it approached $10,000,000,000 at the end of Aug. 1941. Instalment sales credit was subject to the greatest fluctuations and it had the greatest growth, partly because of a general lengthening of the period of repayment in individual contracts. Table II gives estimates of outstanding balances of instalment sales credit and total consumer credit from 1929 to 1940.

Historically, public interest in the consumer credit field has been confined to preventing fraud, harsh collection practices, and excessive interest charges. Legal restrictions upon loans go back to the time of Moses and before. Today, most cash-lending agencies operate under special statutes which limit their charges and impose other restraints for the protection of borrowers. There has been a tendency to subject instalment selling to somewhat similar legal regulations. Indiana in 1934, Wisconsin in 1935 and Maryland in 1941 enacted laws for this purpose.

Table II.—*Outstanding Amounts of Instalment Sales Credit and Total Consumer Credit, 1929 to 1940*

(Amounts in millions of dollars)

Close of	Instalment Sales Credit	Total Consumer Credit	Close of	Instalment Sales Credit	Total Consumer Credit
1929	$3,300	$8,183	1935	$2,380	$6,080
1930	2,830	7,570	1936	3,240	7,435
1931	2,180	6,442	1937	3,638	8,326
1932	1,400	4,957	1938	2,841*	7,392*
1933	1,500	4,807	1939	3,291*	8,076*
1934	1,830	5,222	1940	4,036*	9,190*

*Preliminary.

Consumer Credit and National Defense.—During 1941, however, government also recognized an interest in the economic consequences of consumer credit. Under an executive order issued by the president of the United States on Aug. 9, 1941, the federal reserve board undertook to regulate the terms on which instalment credit might be extended. Regulation W, which became effective Sept. 1, 1941, prescribed minimum down-payments for a list of articles and limited the period of payment for these articles and for instalment loans of less than $1,000 to 18 months. A subsequent amendment extended the maturity limitation to loans of $1,500, prohibited loans to make down-payments, required down-payments in connection with instalment loans to buy listed articles, and limited the maturity of contracts consolidating previous instalment accounts to 15 months.

The objectives of these regulations were threefold: (1) to restrict demand for goods that competed with defense weapons for scarce materials, (2) to compel a liquidation of consumer credit as a means of partially offsetting the inflationary effects of the expansion of the government debt, and (3) to build up a backlog of civilian demand that might be called upon when defense spending stopped.

The tightening of instalment credit terms had a prompt and substantial effect upon sales of automobiles, pianos, refrigerators, plumbing and heating equipment, gas and electric ranges, higher priced radios and sewing machines and other goods for which periods of payment had been customarily long or down-payments small. Sales of vacuum cleaners, washing machines, cheaper radios and furniture dropped off moderately. During the first eight months of 1941, consumer credit expanded at a rate exceeding $100,000,000 a month. In September this trend was reversed, and during the last four months of the year, outstanding balances were liquidated at a rate approximating $150,000,000 a month.

While the control of consumer credit was initiated as an emergency device to cushion the impact of armaments expenditures, it was urged by some that such a control would be equally useful in peacetime to reinforce the monetary weapons available to the federal reserve board. (*See* also LAW.)

(R. NT.)

Continental Divide Tunnel: *see* TUNNELS.

Contract Bridge.

One of the primary changes in the Culbertson system involved the traditional honour-trick table. Certain card combinations were assigned a slightly lower valuation, viz., K-Q-J, which theretofore had been counted as 1½ honour-tricks, was reduced to one-plus honour-trick. More important, however, singletons and voids were translated into honour-trick values so that the player who held a singleton or void was authorized to count a plus value toward his honour-trick total for this distributional factor.

For many years 2½ honour-tricks with a five-card suit had been the traditional requirement for opening the bidding. Thus constrained, players sometimes passed out hands which would have produced a game, or at least a valuable part-score. To relieve this situation a new provision was made for opening the bidding on two-plus honour-tricks if the hand contained a six-card major suit.

Biddable suit requirements were also lowered somewhat, as were the minimum requirements for an original notrump bid. In the new system an opening notrump is based on 3½ to 4 honour-tricks with balanced distribution.

Perhaps the most fundamental change was in connection with the opening two-bid and its responses. No revision was made in the forcing bid itself, but the responses were changed radically. In the old Culbertson system the responder required at least one, and usually one-plus or more honour-tricks, to make a so-called positive response; lacking these values, he had to answer with the artificial "two notrump" denial. Though this technique worked fairly well, it was found that in many cases a partnership

never located its best combined trump suit, *e.g.*, often the responder held nothing but a long suit headed by a king or queen and never found a safe opportunity to show that suit. The new system was designed to correct this evil. It provides that the responder (to an opening two-bid) should answer with two no-trump (a negative response denying strength) only when holding one honour-trick or less with no biddable suit as good as six low cards, or a five-card suit headed by K or Q-J. If the responder does hold any six-card suit, or a five-card suit as good as K or Q-J high, he must bid the suit at the lowest possible level, regardless of the general strength of his hand. (*E.g.*, if the opening bid is two spades and the responder holds six diamonds headed by the ten-spot or lower, with no face card of any description, his correct initial response is three diamonds. Later, of course, he will sign off at every opportunity.)

To compensate for the somewhat lowered requirements for opening the bidding with simple suit bids of one or with one no-trump, ordinary responses were "stepped up" a shade. Thus, in order to hold the bidding open at all with a simple one-over-one suit response, at least ½ honour-trick is required, and with that little the responder must hold a six-card suit. With one honour-trick he may respond at the one level in a five-card suit, or with two suits stopped, may bid one notrump. In order to increase the contract, *i.e.*, to bid two of a suit over an opening suit bid of one, responder requires one-plus to 1½ honour-tricks with a six-card suit or two honour-tricks with a five-card suit.

Other changes in the system were, most of them, of a minor nature.

Despite the war, bridge of all descriptions (duplicate, rubber bridge and team-of-four) continued to flourish in the United States and Canada, and even enjoyed increased popularity in England. Tournament bridge had its greatest year. The American Contract Bridge league, which fosters most of the tournaments in the United States, has grown steadily until in 1941 it had about 15,000 members, and about one-third of these were on the National Master Point list. The annual charity event held by the league, known as the "Have a Heart—Take a Hand Party," raised several thousand dollars for the children's ward of the Memorial hospital in New York city.

Because of the war and of the fact that co-operating committees in England, France and the United States were not able to meet, the contemplated changes in bridge laws were deferred. No changes of any description were made in this department.

(E. CUL.)

Convoys: *see* BLOCKADE.

Copper. While production data are lacking from many countries, the world smelter production of copper in 1940 was estimated at 2,250,000 metric tons, against 2,161,500 tons in 1939, an increase of 4% as compared with an increase of 9% in 1939. The distribution of the output is shown in Table I.

Table I.—*World Production of Copper*
(In thousands of metric tons)

	1929	1937	1938	1939	1940
Belgian Congo	135.5	150.6	124.0	121.5	113.0
Canada	109.9	238.1	263.3	281.5	300.0
Chile	316.8	412.9	351.4	339.2	352.4
Japan	75.5	75.9	77.0	77.0	85.0
Mexico	78.7	46.8	41.4	48.8	37.6
Peru	54.4	35.7	37.5	35.4	36.9
Rhodesia	5.9	212.7	215.3	216.0	231.0
U. S. S. R.	25.8	92.5	98.0	107.0	113.0
United States	931.1	757.4	505.0	666.8	809.5
World Total	1,921.6	2,271.6	1,984.1	2,161.5	2,250.0
Ex. U. S.	990.5	1,514.2	1,479.1	1,494.7	1,440.0

Aside from the United States, data for 1941 were scattered and incomplete, but such information as was available is given as an indication of the trend during the year.

United States.—In 1940 the production of copper in the United States was as follows: recoverable metal content of ore (mine production) was 878,086 short tons; smelter production was 909,084 tons; and refinery production was 1,431,225 tons. The surplus of smelter and refinery production over the preceding figures is largely a measure of the extent to which scrap copper is returned to the plants for reworking, though of course variations in the stocks of raw materials affect the totals.

Table II.—*Mine Production of Copper in the United States*
(Thousands of short tons)

	1936	1937	1938	1939	1940	1941
Alaska	18.9	17.3	14.5	0.1	0.1	0.1
Arizona	211.3	288.5	210.8	262.1	281.2	331.5
California	4.4	5.3	0.8	4.2	0.4	4.7
Colorado	8.9	10.9	14.2	13.2	12.2	6.6
Idaho	1.5	2.2	2.1	2.5	3.3	3.6
Michigan	48.0	47.5	46.7	44.0	45.2	49.2
Montana	109.5	144.5	77.2	97.8	126.4	127.0
Nevada	70.7	74.6	46.2	66.6	78.5	79.8
New Mexico	3.2	32.1	20.4	40.1	69.8	69.7
Utah	126.2	206.0	108.1	171.9	231.9	271.0
Washington	0.1	0.1	6.0	9.0	9.6	8.9
Others	13.2	13.0	10.8	10.8	13.5	13.0
Total	614.5	842.0	557.8	728.3	878.1	965.0

In 1941, mine production to the end of October was 802,137 tons; according to the current rate of output, the year's total could hardly be expected to exceed 965,000 tons, and might fall somewhat short of this; at any rate, the increase over 1940 would be approximately 10%, against 21% increase in 1940. Table II shows the estimates for the state outputs in 1941, which, though based on incomplete returns, should be sufficiently accurate to serve for comparison. These figures indicate declines in output in Colorado, California and Washington; Idaho, Montana, Nevada and New Mexico just about break even, and most of the increase for the year came from Arizona and Utah, with a small amount from Michigan.

To the end of Nov. 1941, members of the Copper institute reported a smelter output of 927,870 tons, against 907,382 tons in the same period of 1940; the full year was estimated at 1,014,000 tons, against 992,293 tons in 1940, an increase of only 2%, against 19% in 1940. Refined output showed up somewhat better, being estimated at 1,120,000 tons in 1941, against 1,033,710 tons in 1940, an increase of 8%.

Deliveries to domestic consumers in 1940 were 1,001,886 tons, and for export 48,507 tons; in 1941 export deliveries dropped to almost nothing, while deliveries to domestic consumers were supplemented heavily by imported copper, being estimated at 1,500,000 tons for the year. Since 1939

Table III.—*United States Foreign Trade in Copper*
(Millions of pounds)

	Imports	Exports	Balance
1936	380.7	524.8	Net export, 144.1
1937	559.7	700.0	" " 140.9
1938	504.3	844.0	" " 339.7
1939	672.6	855.2	" " 182.6
1940	982.7	855.9	Net import, 126.8
1941 (9 mo.)	990.6	217.4	" " 773.2

deliveries ran ahead of production plus imports, so that stocks declined heavily, the total decrease being 112,485 tons in 1939, 58,130 tons in 1940, and 125,617 tons to the end of Sept. 1941, after which there had been a slight improvement. Stocks of refined copper, not including consumers' stocks, were down to 65,670 tons at the end of September, but had recovered to 72,352 tons at the end of Nov. 1941. This turn in the tide was a welcome one, because the reserves were too low to carry much longer at the former rate of depletion. However, after the United States was forced into the war as an active participant, it seemed probable that increased demand would result in further lowering of the already too low reserves. It might be that consumers' stocks were sufficient to carry the drain for a time, but in any case it was evident that additional supplies were urgently needed. To furnish these the United States had three possible sources on which to draw: increased domestic mine production, increased imports and increased recoveries of secondary metal.

Secondary recovery of copper from scrap supplied a surprisingly large proportion of the consumption. In 1940 the secondary copper recovered totalled 532,046 tons, of which 170,839 tons was as metal, 341,776 tons was in brass and other alloys, and 9,431 tons in chemicals. Since mine production in 1940 was 878,086 tons, it would appear at first glance that scrap recovery supplied 60% as much copper as did the mining industry, but this figure is distorted. Of the total secondary recovery, 198,156 tons was in the form of new scrap, and 333,890 tons in old scrap; in other words, 37% of the secondary recovery was from plant scrap produced in the fabrication of finished products, had never been in use, and simply needed to be returned for remelting; on the other hand, the remaining 63% of the secondary recovery was worn out material that had been discarded from the pool of metal in use, and this represented 38% of the mine output of new metal, which still remains an impressive figure.

War demand caused a radical shift in the trend of foreign trade in copper, as is shown in Table III.

In the past much of the copper imported was for smelting, refining, and re-export, and such amounts as were imported for consumption were more than balanced by exports of domestic copper, so that all told there was a

definite export balance. As a result of the increased imports, this was materially reduced in 1939, and later a decrease in exports shifted the balance to the import side.

Belgian Congo.—No information was available on operations, but shipments from the Congo received in the United States during the first three quarters of 1941 totalled about 32,800 tons of copper that had formerly gone to Belgium.

Chile.—Exports of copper from Chile during the first three quarters of 1941 were 320,998 metric tons, against 273,462 tons in the same period of 1940; of this total, 294,079 tons went to the United States, and 16,174 tons went to Japan in the first quarter, but none later. Japan also took 5,838 tons of ore and concentrates, against 308 tons to the United States.

Mexico.—Copper content of ores and concentrates produced in the first half of 1941 was 25,343 metric tons, as compared with 18,660 tons in the same period of 1940.

Peru.—Production for the first eight months of 1941 was 19,900 metric tons, a monthly average of 2,500 tons, against 2,800 tons in 1940.

Philippine Islands.—Copper production in ore, concentrates and matte was 10,200 short tons in 1940, and was expected to be nearly 11,000 tons in 1941. Exports were largely to Japan—6,074 tons in 1940, and a prospective 4,500 tons in 1941.

South Africa.—Production during the first half of 1941 included 4,920 short tons of ingot and 6,457 tons of blister copper, as well as 2,195 tons of copper-gold concentrates. Exports were 3,218 tons of ingot and 6,681 tons of blister. Metal production and exports were both about double those of the same period of 1940, due to the operation of a new plant. (*See* also MINERAL AND METAL PRICES AND PRODUCTION; STRATEGIC MINERAL SUPPLIES.)

(G. A. Ro.)

Copra: *see* COCO-NUTS.

Copyright. During the year 1941 the copyright law of the United States was amended in one important respect by Public Act. No. 258, 77th congress, approved, Sept. 25, 1941. The president by proclamation may grant an appropriate extension of time to those persons who, because of disruption and suspension of facilities resulting from the international emergency, are prevented from complying with the conditions and formalities required by the copyright act.

Other bills for general revision of the copyright law were introduced in congress in 1941. Thus far, however, consideration of matters of critical importance to the nation have confined changes in copyright legislation to the amendment above recorded.

During the fiscal year ending June 30, 1941, 180,647 registrations of claims to copyright were made in the copyright office. The total fees received amounted to $374,125.35.

The copyright act in force requires, as one of the conditions precedent to the registration of a claim of copyright in any published work, the deposit of two copies of domestic works and one copy of foreign works. One of the basic purposes of this provision is to secure copies of editions best suited to the enrichment of the Library of Congress. The number of books and other articles deposited in connection with registrations made during the fiscal year amounted to 283,737, of which number 171,115 were transferred to the Library of Congress. These included 67,979 books, 74,460 periodical numbers, 22,530 pieces of music, 2,560 maps and 1,586 photographs and engravings. (*See* also LAW.)

(C. L. B.)

Corn (MAIZE). Production of corn in the United States in 1941 averaged 31·1 bu. per acre, the highest yield in the 75 years of record excepting in 1906, when the yield was 31·7 bu. per acre. The 1941 crop was estimated by the department of agriculture Nov. 10 as 2,675,373,000 bu., compared with 2,449,000,000 bu. in 1940, and a ten-year (1930–39) average of 2,307,452,000 bu. The acreage in 1941 was 85,943,000 ac.; that of 1940 was 86,449,000 ac.; the ten-year average, 98,049,000 ac. The per-acre yield in 1940 was 28·3 bu., and the ten-year average was 23·5 bu. The higher yield in 1941 was due to the expanding use of hybrid varieties throughout the corn belt. The yield was reached despite unusually wet weather during the harvest season, when husking operations were severely hampered and there was loss from wet-weather sprouting of ears on the ground.

In Canada the first official estimate placed the 1941 crop at 11,906,000 bu., compared with 6,956,000 bu. in 1940. In Argentina the corn crop harvested in 1941 was 403,048,000 bu., about 5,000,000 bu. less than the 1940 crop. The corn surplus in Argentina in 1940 and 1941 and the almost complete loss of European export markets became so burdensome that the government made extensive efforts to find other uses for the grain, such as fuel in industrial plants and in homes. Corn fuel briquettes and corn ears coated with petroleum by-products were used in Argentina.

U.S. Corn Production by States, 1941 and 1940

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Iowa	465,171,000	460,581,000	South Carolina	23,814,000	24,304,000
Illinois	404,231,000	332,244,000	Louisiana	22,170,000	24,128,000
Minnesota	200,116,000	172,457,000	Maryland	16,135,000	17,535,000
Indiana	177,163,000	145,609,000	Colorado	15,555,000	10,656,000
Ohio	159,348,000	120,750,000	West Virginia	13,290,000	12,852,000
Nebraska	152,280,000	106,913,000	New Jersey	7,869,000	7,371,000
Missouri	116,112,000	119,280,000	Florida	7,533,000	9,031,000
Wisconsin	89,280,000	93,582,000	Delaware	4,110,000	3,948,000
Kentucky	78,848,000	70,400,000	New Mexico	3,325,000	2,376,000
Texas	69,480,000	90,324,000	Montana	3,145,000	2,544,000
Tennessee	69,156,000	69,175,000	Wyoming	2,928,000	1,930,000
Pennsylvania	56,594,000	53,640,000	Vermont	2,880,000	2,627,000
Kansas	56,544,000	41,028,000	California	2,310,000	2,240,000
Alabama	52,266,000	43,450,000	Connecticut	2,058,000	1,960,000
South Dakota	50,112,000	50,112,000	Oregon	1,890,000	1,860,000
Michigan	48,352,000	49,856,000	Idaho	1,560,000	1,202,000
Mississippi	47,753,000	40,544,000	Massachusetts	1,558,000	1,558,000
North Carolina	47,400,000	43,507,000	Washington	1,260,000	1,146,000
Georgia	42,934,000	46,849,000	Utah	638,000	616,000
Arkansas	38,817,000	42,903,000	New Hampshire	630,000	600,000
Virginia	33,711,000	36,400,000	Maine	492,000	507,000
Oklahoma	31,202,000	40,356,000	Arizona	406,000	362,000
North Dakota	26,266,000	24,480,000	Rhode Island	360,000	369,000
New York	26,109,000	21,452,000	Nevada	150,000	120,000

Silage yields were above average in all sections of the United States in 1941, the department of agriculture reported. No figures on corn production in Europe were available in 1941, except for Spain, where the 1941 crop was estimated at 27,749,000 bu., compared with 29,202,000 in 1940. Corn, however, is not a principal crop, as in the United States and Argentina. (*See* also CEREALS.)

(S. O. R.)

Cornell University. A university of higher learning, nonsectarian and coeducational, at Ithaca, N.Y., founded in 1865 and incorporated as a land-grant college under the Morrill act of 1862. The university comprises the endowed schools and colleges of arts and sciences, engineering, architecture, law and medicine (located in New York city and operated in conjunction with the New York hospital), and the state-supported colleges of agriculture, home economics and veterinary medicine. Two experiment stations, at Geneva and Farmingdale, N.Y., are operated in connection with the college of agriculture. Degrees for advanced study other than professional are awarded through a graduate school. During the academic year 1940–41, there were 7,315 students, of whom 1,559 were women. The faculty, which had 1,831 members, included 53 emeritus professors, 334 professors, 76 associate professors, 261 assistant professors, 34 lecturers and associates, 502 instructors and 571 assistants. New educational offerings during the year included a five-year program of training for secondary-school teachers, centring in the school of education, and a new five-year course for teachers of art in the elementary and secondary schools operated jointly by the college of architecture and the school of education. Productive funds on June 30, 1941, amounted to $32,445,803. Land and buildings were valued in 1941 at $19,894,100, and equipment at $8,318,828. The library contained 1,094,117 volumes.

(E. E. D.)

Cornhusking. The championship of the United States for picking and husking corn in 1941 was won by Floyd Wise of Prairie Center, Ill. In the national contest sponsored by the *Prairie Farmer* magazine in Tonica, Ill., Wise picked 45·37 bu. in 80 minutes, competing against 21 of the fastest corn pickers from 11 states. Leland Klein of Illinois picked 45·214

bu.; Ivyle Carlson of Iowa picked 44·36 bu.; Irvin Bauman of Illinois, whose record of 46·71 bu. won him the 1940 national crown, did not compete. A huge crowd of about 100,000 people witnessed the 18th annual cornhusking championship. (J. B. P.)

Corporation Income Tax: *see* TAXATION.
Corundum: *see* ABRASIVES.
Cosmetics: *see* SOAP, PERFUMERY AND COSMETICS.
Cosmic Rays: *see* PHYSICS.

Costa Rica. A central American republic; area, 23,000 sq.mi.; pop. (1941 official est.), 668,060; capital, San José (pop. 66,800). Other principal cities are Heredia, Alejuela and Cartago, in the interior, and the ports of Puntarenas (Pacific) and Puerto Limón (Caribbean), with from 7,000 to 10,000 population each. President, Rafael Angel Calderón Guardia.

History.—Throughout 1941 Costa Rican public opinion was, in keeping with the country's traditional democratic feeling, strongly Pan-American and anti-axis. In January the government banned the dissemination of totalitarian propaganda through the mails and deported two Germans in May on charges of pro-axis activities. These and other anti-axis measures, including seizure of axis ships in May, prompted a German demand in August for withdrawal of Costa Rican consuls from German-dominated areas. A nation-wide anti-axis demonstration followed, resulting in the expulsion of all German consular representatives. In December, when Japan attacked the United States, Costa Rica immediately declared war—preceding even China in its formal declaration—and quickly followed with declarations against Germany and Italy.

Defense measures involved the close co-operation of the United States. In June Costa Rica obtained a U.S. credit of $500,000 to acquire war materials, and two months later an agreement authorized the sending of a United States military mission to Costa Rica. At the same time efforts were made to enlarge the army, estimated to comprise some 350 men.

Negotiations begun in 1940 culminated in 1941 in a $4,600,000 loan by the United States Export-Import bank, to further work begun on the Costa Rican portion of the Inter-American highway and to stabilize Costa Rican currency. Important also was the signing of a boundary agreement with Panama, thus marking the disappearance of a long-standing and potentially dangerous dispute.

Education.—Costa Rica, the cultural centre of Central America, has 671 public schools (64,594 pupils). The national university is at San José. Costa Rica's literacy rate (76%) is one of the highest in Latin America.

Finance.—The monetary unit is the colón (value: approx. 17¼ cents U.S. in 1941).

Trade.—In 1940 imports (chiefly foodstuffs and manufactured goods) totalled $16,840,463 (United States, 75%; Great Britain, 4.5%); exports were $7,483,957 (United States, 58.8%; Great Britain, 25.1%). Coffee (53.3% in 1940), bananas (25.4%) and cacao (8.1%) are the most important exports.

Communication.—Steamship lines link both coasts with the principal ports of the world. San José is a main stop on the Pan American Airways line, while domestic air lines connect the chief cities. There were 320 mi. of railways in 1941. The 1,800-mi. highway system is inadequate, especially in linking the coast with the plateau districts. The Inter-American highway was in process of construction during 1941 through the difficult mountainous terrain near the Panama border. When completed, Costa Rica's 312-mi. section of the highway will be the longest of any single Central American country. (L. W. BE.; L. C. DEA.)

Cost of Living. The upward trend of the cost of living characteristic of almost the entire world after 1933 continued into 1940–41. It was sharply accelerated in 1941 as the war spread over more and more of the world.

The cost of living rose materially in Great Britain, Norway, Sweden and Italy in 1940. In Germany government control of prices prevented the sharp upward price trend which might have been expected otherwise in view of their diminished supplies of many products.

The price indexes of the other countries moved upward during 1940 at a slower rate. The United States cost of living rose less than 5% during the first year of the war.

Indexes of Cost of Living for Specified Periods for the United States and Certain Foreign Countries

(Series recalculated by International Labour Office on base 1929=100; a=food; b=heating and lighting; c=clothing; d=rent; e=miscellaneous)*

Country	Australia	Canada	France	Germany	Gr. Brit. & N. Ireland	Italy	New Zealand	Norway	Sweden	So. Africa	U.S.
Towns and localities	30	69	45	72	500	50	4–25	31	49	9	32–51
Original base=100	1923–27	1935–39	1930	1913–1914	July 1914	June 1928	1926–1930	July 1914	1935	1938	1923–25
Composition of index	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e
1929	100	100	..	100	100	100	100	100	100	100	100
1933	78	78	87	77	85	80	79	89	91	87	75
1937	85	83	102	81	94	91	92	100	95	91	84
1938	87	84	117	82	95	98	95	103	98	94	82
1939	89	84	..	82	96	102	98	105	99	94	81
1940	93	87	..	84	113	117	103	122	111	97	82
1941 Jan.	..	89	..	85	120	..	105	136	..	98	..
Feb.	97	89	..	86	120	..	105	138	..	99	..
Mar.	..	89	..	86	121	..	105	139	129	100	83
Apr.	..	90	..	86	122	..	106	140	..	101	..
May	..	91	..	87	122	..	106	141	..	101	..
June	..	92	..	..	121	..	..	143	129	102	85
July	..	93	..	..	121	..	..	..	..	..	..

*Table compiled from *International Labour Review*, Oct. 1941.

Late 1940 and the first three-quarters of 1941 saw a sharp rise in the cost of living in most if not all countries. The current statistics for some countries are so inaccurate, as a result of the war, that they have to be used with mental reservations.

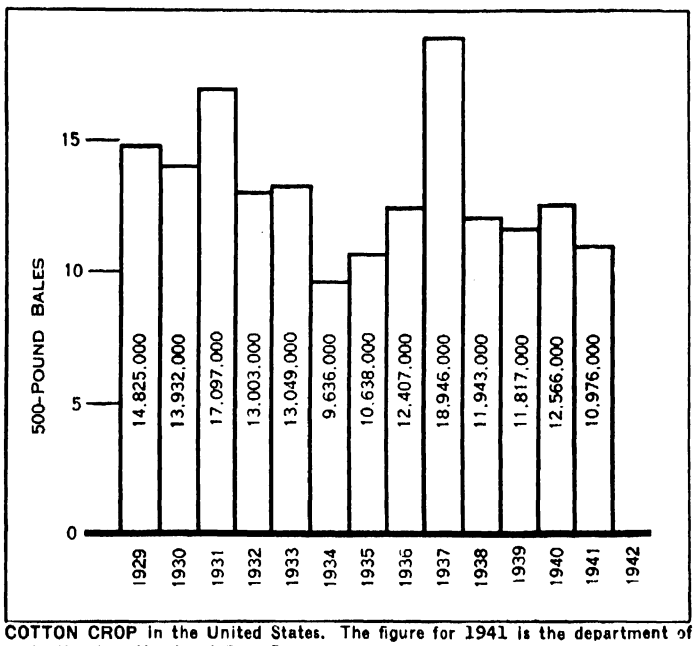
In the United States, the index number for all foods (1935–39 =100) rose in 51 large cities from 93·5 on Aug. 15, 1939, to 96·2 on Oct. 15, 1940; 111·6 on Oct. 15; and 113·1 on Nov. 15, 1941. The American index number for clothing stood at 114·4 in Nov. 1941; for rent, at 107·9; and for house furnishings, at 115·8 (preliminary figures). Great Britain, Norway and Sweden show particularly rapid increases in 1941, the other countries more gradual ones.

In 1939 there was a slight increase during the early part of the year and a more substantial upward movement during the late summer and fall. Early 1940 figures showed slight increases.

The accompanying table shows the relative trends of cost of living in 11 countries from 1929 through July 1941. The figures have been recalculated by the International Labour office on a 1929 base and this table cannot be compared directly with the table published for 1937 and previous years. (*See* also BUSINESS REVIEW: *Commodity Prices;* PRICES; WEALTH AND INCOME, DISTRIBUTION OF.)

BIBLIOGRAPHY.—Readers interested in additional information are referred to current issues of the *Monthly Labor Review* (U.S. bureau of labour statistics), the *Ministry of Labour Gazette* (British ministry of labour), and *The Labour Gazette* (department of labour, Canada). *Cf.* also *International Labour Review.* (D. D. L.)

Cotton. Spread of the World War in 1941 cut off all continental Europe from international trade in cotton, excepting Portugal and Spain, which could import under British



COTTON CROP in the United States. The figure for 1941 is the department of agriculture's estimate of Dec. 1.

naval certificate, and excepting an inconsequential quantity of Turkish cotton which might get through to Germany. Entry of the U.S.S.R. into the war June 22 stopped all exports of Russian cotton to Rumania, Hungary, Bulgaria and Finland. With the freezing of Japanese credits in July by the United States, Great Britain and the Netherlands, the great Japanese cotton industry slumped sharply, with 1,250,000,000 sq.yd. of cloth goods on hand, and later came to a virtual standstill. These developments, further complicated by shortage of ocean shipping, indicated that world exports of cotton in 1941–42 would be considerably reduced from the low figure of 1940–41, when only 6,300,000 bales were exported, as compared with 12,500,000 bales in world trade in 1939–40.

In contrast to reduced world trade in cotton, production of the staple continued at a high rate, to such an extent that Egypt offered a bonus for conversion of cotton lands to food crops. In the United States, although the government urged unprecedented increase in most farm crops, cotton was one of the three major crops on which the government in 1941 still maintained a curb on production. The other two were wheat and tobacco. The fact that only five cotton crops in the period 1910–40 were smaller than the 1941 crop indicated a trend away from the burdensome surpluses of cotton common in the United States prior to World War II. Production of cotton in the United States in 1941 was 10,976,000 bales, compared with 12,566,000 bales in 1940 and a ten-year (1930–39) average of 13,246,000 bales. The acreage harvested in 1941 was 22,376,000. In 1940 it was 23,861,000 ac.; the ten-year average was 31,223,000 ac. The yield was 235·4 lb. to the ac. in 1941 and 252·5 in 1940; the ten-year average was 205·4 lb. to the ac. The U.S. department of agriculture estimated 65 lb. of cotton-seed produced to each 35 lb. of cotton (lint). On that basis cotton-seed production in the United States in 1941 was 4,892,000 tons. It was 5,595,000 tons in 1940; the ten-year average was 5,890,000 tons. (For U.S. lend-lease shipments of cotton and cotton products to Great Britain *see* FARM INCOME.)

Brazilian cotton, at 4 to 5 cents per lb. cheaper than United States cotton, made considerable inroads in the market in Canada, where production of cotton textiles had greatly increased. A considerable part of the Canadian manufacture consisted of war materials for the U.S.S.R. and China. In the six months ending July 31, 1940, Canada consumed 202,573 bales (running bales of 500 lb.) of United States cotton and 893 bales of Brazilian cotton. In the following six months, Canadian consumption was 125,897 bales of United States and 86,533 bales of Brazilian cotton, while in the six months ending July 31, 1941, Canadian mills used 81,111 bales of United States cotton and 161,537 bales of Brazilian cotton. The 1941 crop in Brazil was estimated at 2,557,000 bales (478 lb. to the bale), with 1,333,000 bales exported during the year ending July 31, 1941. A record carry-over estimated at 450,000 to 700,000 bales taxed storage space in São Paulo, and an estimated 10% increase was foreseen for the crop to be harvested in March–June 1942.

The 1941 cotton crop in India was estimated at 5,021,000 bales (478-lb. bale) compared with 5,439,000 bales in 1940. India lost its two principal cotton markets, China and Japan, in the summer of 1941 when the United States, Great Britain and the Netherlands froze Japanese credits, and the Chinese could not obtain enough foreign exchange or shipping facilities to maintain imports.

China's 1941 cotton crop was estimated by the United States' agricultural attaché at Shanghai as about 2,400,000 bales, an increase of 50,000 bales over that of 1940. The Manchurian crop was 93,000 bales in 1941, a 20% increase over that of 1940. The Japanese provided $352,000 for bounties to increase the cotton acreage in Chosen, which planted 810,000 ac. to cotton in 1941 to augment supplies.

Egypt produced 1,640,000 bales of cotton in 1941, as against 1,900,000 bales in 1940. On Oct. 30, 1941, the government issued a decree offering to growers $7.95 per ac. in Upper Egypt and $5.96 per ac. in Lower Egypt to convert cotton lands to the production of wheat, barley and beans. Acreage for the 1942 crop was ordered reduced by 20% under the 1940 planting of 1,749,000 ac. Cotton textile production in Egypt was put under military supervision to prevent profiteering. Great Britain agreed to buy one-half the Egyptian crop of 1942 at 11.41 to 16.5 cents per lb., the Egyptian government to pay 1.67 cents per lb. more for the remainder and also pay 1.67 cents per lb. to growers selling to Great Britain.

Bolivia embarked on an ambitious program in 1941 to become a cotton-producing country. Bolivian cotton acreage had averaged about 800 ac., but the country was said to have 270,000 ac. suitable for cotton in 1941. A tariff on cotton imports was imposed in 1941, and an assessment was ordered against each manufacturer according to his imports of cotton. This assessment was placed at one-fourth cent per lb. in 1941, but was to be increased gradually to 10.7 cents per lb. of imported cotton by 1950, and, with the cotton tariff revenue, was to provide funds to extend cotton growing.

Table I.—*Cotton Production in Certain Countries, 1941 and 1940*

Country	1941 bales	1940 bales
Peru	330,500	382,900
Mexico	333,000	288,000
Argentina	232,000	362,000
Iran	208,000	231,000
Nigeria	29,000–33,000	55,000
Rumania	21,000	8,500
Haiti	13,000	9,200
Ecuador	11,700	9,200
Spain	9,200	....

The cotton shortage in Europe, where textile mills ran only part-time in 1941, was reflected in Bulgaria's subsidizing efforts which increased the cotton acreage from 129,000 ac. in 1940 to 178,000 ac. in 1941. The normal Bulgarian crop is 45,000 bales. The 1941 production was not reported. Great Britain traded 90,000 bales of Belgian Congo cotton to

Table II.—*U.S. Production of Cotton in Leading States, 1941, 1940 and 1930-39 Average*

State	1941 bales	1940 bales	1930–39 (Annual average) bales
Texas	2,745,000	3,234,000	3,766,000
Arkansas	1,445,000	1,501,000	1,281,000
Mississippi	1,420,000	1,250,000	1,585,000
Alabama	700,000	779,000	1,145,000
Georgia	624,000	1,010,000	1,137,000

Spain for wool to relieve an acute cotton shortage in the latter country; Spain had been unable to finance a purchase of 196,000 bales of cotton from Brazil. The Nigerian crops of 1940 and 1941 remained in storage for lack of ocean shipping. (S. O. R.)

Cotton Manufacture.—The national defense program from Jan. 1 to Dec. 7 and the war program from Dec. 7 to Dec. 31, completely dominated the progress of the cotton textile industry in 1941. Never before had it been pushed to such high production levels or placed under such a strain of conflicting forces: unprecedented demand on the one hand, and price ceilings on the other. The net result was an all-time high record of consumption of cotton and of production of cotton textiles. The mill activity was approximately one-third greater than that of 1940, which in turn had set a high record to date.

The pressure of government purchases created several serious situations in cotton textile production. One of the most difficult of all was that in duck. During the period from Sept. 1, 1940, to Nov. 11, 1941, 64,000,000 yd. of duck were purchased by the quartermaster corps. But even this did not meet the full needs of the army, as gauged by their estimates; bids were undersubscribed. Another bottleneck was combed yarn, specified in several important quartermaster articles, including cotton-twill uniform cloth, cotton shorts, undershirts, etc. Because of the extreme pressure on this item, it was found necessary to modify the specifications to some degree. Despite these bottlenecks, however, the industry met the demands of the defense and war programs in a highly satisfactory way, and at the same time produced materials for civilian use at a very high rate.

It was estimated that about 20% of the 1941 output of cotton goods went into strictly military channels while another 20% was purchased as industrial fabrics by those branches of American industry supplying instruments of war. The remaining 60% went into the ordinary outlets.

It was recognized, of course, that 1942 would present far more serious problems to the industry than did 1941. With the prospect of an infinitely larger army than was contemplated prior to Pearl Harbor, the percentage of the industry's product going into war use would be sharply increased. Furthermore, the balance of the equipment not operating on such products would find it difficult to secure machine parts, and even to some extent materials and labour. In this respect the cotton textile industry was particularly well situated, since a large part of its labour is female, and also since there has been right along a surplus of raw cotton. However, that surplus was not as reassuring as was generally believed. There were many grades and staples in short supply. In fact it was the belief of many that what was needed was a reversal of attitude: namely, the substitution of a crop-expansion program for the crop-reduction program which had been in existence since 1933.

Experience in Lancashire.—Naturally, the experience of the British cotton industry, after more than two years at war, was followed closely by students of the cotton textile industry in the United States. Particular interest was attached to the "concentration of production" program conducted in Lancashire. This meant, in essence, the elimination, at a compensation, of mills classed as "redundant" and the concentration of production in the more efficient units, known as the "nucleus" mills. As of the latter part of 1941, out of close to 2,000 firms in cotton manufacturing which had been classified thus far under the concentration scheme, about 60% had been allowed to continue operations. Most of the remaining firms had closed down or were to do so in the near future. Two difficulties encountered were, first, the fact that the production capacity in the "nucleus" mills was found insufficient to cope with all important demands; and, second, the problem of finding other types of labour for the employees turned out of work in the "redundant" mills, and of persuading them—particularly the women employees—to adjust themselves to other kinds of work.

The whole development in Lancashire was being watched in the United States in more or less the attitude, "It happened in Lancashire; it could happen here."

Price Ceilings.—American textile manufacturers did not have to look to Lancashire, however, for indications of what price control meant. It had its own experience at home. The cotton division of the industry was one of the earliest guinea-pigs; on May 24, price ceilings were set on combed cotton yarn. From then on, a bewildering series of such actions took place, gradually drawing in the other principal yarns and fabrics in the industry. The most important further change was the basic arrangement made in October whereby the ceiling prices of cotton gray goods were tied, or adjusted, to the market price of spot raw cotton. This was later extended to yarns. This automatic adjustment of manufactured products to the raw material was generally considered in the industry a decided improvement over the arbitrary ceilings previously set.

The function of the Office of Price Administration (*q.v.*) was the focal point of controversy throughout the year. The main objections raised by textile manufacturers to the methods of that organization were, first, the fact that ceilings were set piece-meal, first on one material and then on another, thus throwing out of line the price relationships among commodities and manufactured products; and, second, that ceilings on wages and on farm products were not included. These points of view were not confined to the cotton textile industry, but in fact represented one of the main avenues of controversy over the pending price legislation.

Wage-Hour Legislation.—When one recalls the excitement which attended the establishment of 32½ cents as the minimum hourly wage in the cotton textile industry in Oct. 1939, the change that occurred in 1940 and 1941 is dramatically revealed. An industry committee appointed by the wage-hour administrator to review this wage and its effect upon the industry recommended in April 1941 a 5-cent increase in the minimum wage, from 32½ to 37½ cents. It made barely an impression upon the industry and no opposition developed. The change in attitude was due primarily to the effect of the defense program, which had brought the industry to boom conditions. The next and last step that can be taken under the wage-hour law, an increase to 40 cents, the maximum provided by the statute, was recommended to become effective early in 1942.

Three-Shift Operation.—One of the most important effects of the defense demands upon the industry was the increase of a great many mills from two-shift to three-shift operation. In October, for example, operation of active machinery averaged 132.5% of two-shift production, a record which would have been practically inconceivable in 1940. Active spindleage in certain of the southern states averaged but slightly under a full three-shift run. Those mills which did not extend to three-shift operation failed to do so principally because of the lack of machinery to make possible a balanced 24-hour operation, and also because of the lack of sufficient labour for three shifts.

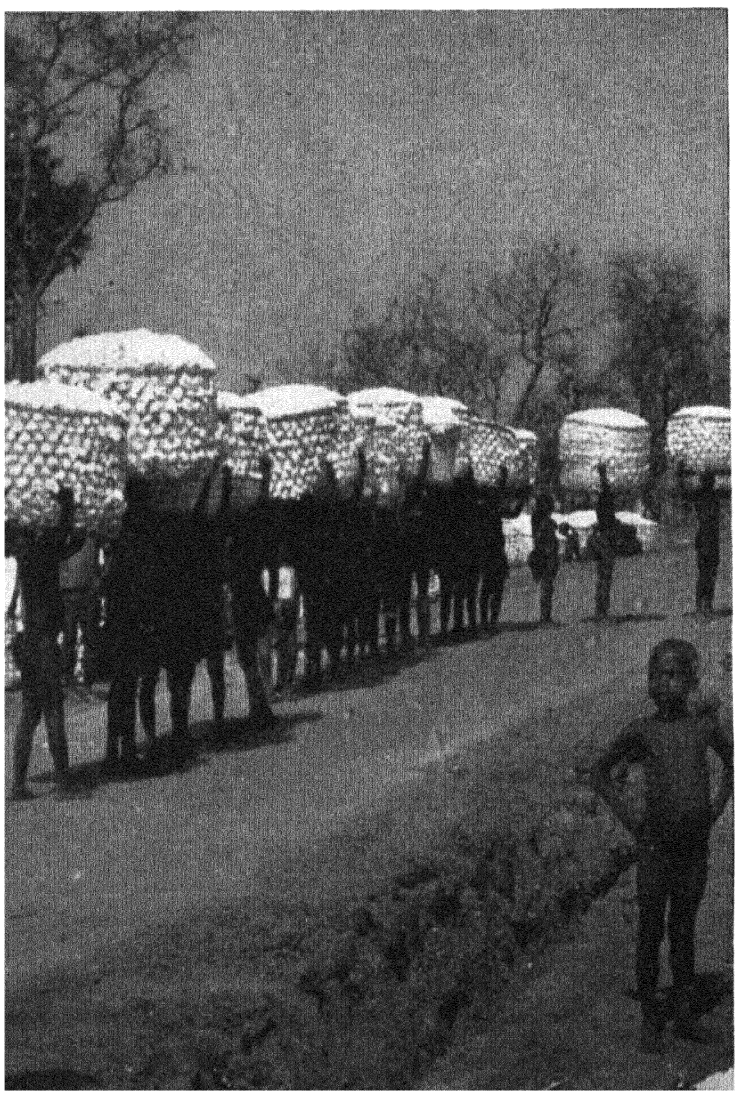
One of the principal results of World War I was an increase in the industry from one-shift to two-shift operation. The move in 1941 was from two-shift to three-shift. In the reaction which followed after the inflation from World War I, the serious aspects of this large increase in actual and potential operation were dramatized. It seemed inevitable that eventually the industry would have to suffer for this new form of expansion and that this suffering would take the form, again, of overproduction and depression.

Major Military Fabrics.—The tremendous scale of government demands for textiles can be visualized by a glance at the following table, which lists the more important cotton fabrics and other products purchased by the quartermaster corps during the period from Sept. 1, 1940 to Nov. 11, 1941.

Khaki cotton twill uniform cloth, yd.	45,158,892
Herringbone-twill cotton cloth, yd.	49,823,000
Cotton uniform cloth, yd.	61,060,000
Wind-resistant cloth, yd.	10,720,000
Cotton lining cloth, yd.	32,000,000
Cotton twill cloth (tent), yd.	22,285,000
Khaki cotton cloth, yd.	48,000,000
Cotton drill, bleached and unbleached, yd.	32,300,000
Cotton cloth, yd.	40,900,000
Canvas padding, cotton, yd.	6,305,786
Cotton webbing, yd.	8,350,000
Cotton jean cloth, yd.	3,000,000
Cotton duck, tent and O.D., yd.	64,000,000
Mosquito netting, yd.	40,000,000
Underwear, shirts and drawers	72,000,000

(*See* also LINEN AND FLAX; RAYON; TEXTILE INDUSTRY; WOOL; etc.)
(D. G. Wo.)

Cotton-seed Oil: *see* VEGETABLE OILS AND ANIMAL FATS.



CULTIVATED COTTON being carried to market in 1941 in French Equatorial Africa (Free France)

Couch, Harvey Crowley (1877–1941), U.S. utilities and railroad magnate, was born Aug. 21 in Calhoun, Ark. After working on cotton farms and as a railroad mail clerk, young Couch and a friend organized the North Louisiana Telephone company, which he sold to the Bell Telephone company in 1913 for an estimated $1,500,000. With this capital, Couch and a few friends organized the Arkansas Power and Light company, which, with its affiliates, became one of the largest utilities groups in the southwest. In 1929 he ventured into the railroad field, purchasing two Louisiana roads, and in 1937 he acquired virtual control of the Kansas City Southern railway. In 1932 President Hoover made Couch a director of the Reconstruction Finance corporation, from which post he resigned in 1934. He died at his summer home on Lake Catherine, near Hot Springs, Ark., July 30.

Countries of the World, Areas and Populations of the: *see* AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

Credit, Consumer: *see* CONSUMER CREDIT.

Crerar, Henry Duncan Graham (1888–), Canadian army officer, was born April 28 in Hamilton, Ont. Educated at Upper Canada college and the Royal Military college, Kingston, he was commissioned as a lieutenant in 1910. He served in France during World War I, advancing to the rank of lieutenant colonel. After the war, he was appointed a staff officer of artillery in the department of national defense, 1920, and became a general staff officer attached to the British war office, 1925. An expert on strategy, he later became director of military operations and intelligence in the department of national defense. After the outbreak of World War II, he went overseas with the rank of a brigadier and, in 1940, he was promoted to major general. He was subsequently appointed lieutenant general, but he voluntarily stepped down to major general in order to take a combat command as head of a Canadian division in Britain. Gen. Crerar took acting command of the entire Canadian corps on Dec. 26, 1941.

Cricket. In 1941, for the second year in succession first-class cricket, properly so called, was nonexistent in England; there were no county contests, no "tests," no "Gentlemen *v.* Players," and such university matches as there were were "off the record," so to speak. But the members of the forces who thronged Lords and other grounds—often to the financial advantage of the Red Cross or war distress funds—saw plenty of good cricket; and many of the clubs and most of the schools kept their grounds going wherever these had not been trenched or taken over for gun-sites, balloon barrages, or some other warlike purpose. So, in a season when the weather, for the most part, was none too summery and all the leading players were doing full-time jobs in one or other of the services, the game was kept much alive largely by elevens collected for the purpose. such as the London Counties (under the presidency of Jack Hobbs), Pelham Warner's, the British Empire, the Club Cricket conference and the services themselves.

The season at Lords, where admission was usually 6*d.*, uniformed spectators being let in free, opened with a lively game between the London Fire Services and Reading university and finished with a great match between the army and a Lords XI, when a crowd of 10,000 saw Denis Compton score a brilliant 114 for the army. Another fine match was that between Pelham Warner's XI and a British Empire side when the former team, which included six "test" players and two England captains, won by one wicket in the last few minutes of the usual one-day match. In school cricket the outstanding event was the game between the M.C.C. and Rugby played at Rugby on the same ground on which, 100 years earlier, was played the match immortalized in *Tom Brown's School Days;* again, as then, the secretary of the M.C.C.—this time an old Rugbeian—led his side, and again, as then, the M.C.C. won—though this time easily. An unofficial Eton *v.* Harrow was won by Eton, on her own ground.

In Australia a series of interstate matches, played for the benefit of the patriotic funds, took the place of the usual tournament for the Sheffield Shield, now held by New South Wales. In one of these—South Australia *v.* Victoria, resulting in a draw—both C. L. Badcock (S.A.) and R. L. Hamence (S.A.) scored centuries in each innings. Over the series as a whole New South Wales came out on top.

Crime. Completing their 12th year, the *Uniform Crime Reports* continued to present comparable data on the volume and distribution of criminal acts, although still largely confined in their scope to urban jurisdictions. As of Sept. 30, 1941, the reporting areas included 94·9% of all cities and towns in the United States with more than 10,000 population, and 98·5% of the total population of all communities of this character. Smaller cities, villages and rural townships (under 10,000 population) to the number of 1,927, and with an aggregate population of 9,731,037, were also included. Thus a grand total of more than 71,000,000 inhabitants was embraced in the reporting areas.

Crime in Cities, Towns and Villages.—The upswing in crimes that marked the latter years of the 1930–39 decennium was continued in some degree in 1940 and 1941. This was particularly true of murder and non-negligent manslaughter, aggravated assault, rape and auto theft. The unfavourable changes were not so large however as to suggest the resurgence of an actual crime wave, but rather resembled a slowly rising tide in certain categories of reportable offenses during these years. Whatever the significance of the change might have been, it was offset in part in 1941 by a decline in the rates for manslaughter by negligence, robbery and burglary, with at least a temporary stabilization in the figures for larceny.

A comparative statement of crime rates for the first nine months of the years 1939, 1940 and 1941 appears in Table I. It is based upon returns from 2,109 cities, towns and villages in 1941, from 2,025 such communities in 1940 and from 1,964 in 1939.

Table I.—*Offenses Known to the Police*

January-September, 1939–41 Inclusive; Rates per 100,000 of Population

Offense	1941	1940	1939	Offense	1941	1940	1939
Murder and Non-negligent Manslaughter	4.22	4.0	4.0	Robbery	35.3	39.1	40.7
				Aggravated Assault	36.9	34.8	34.3
				Burglary—Breaking or Entering	245.0	263.8	259.4
Manslaughter by Negligence	2.86	3.1	2.9	Larceny—Theft	681.8	690.3	652.1
Rape	7.17	6.8	6.8	Auto Theft	135.6	129.0	128.8

There were few changes in the geographic distribution of crime. The south Atlantic, east south central and Pacific states in general had the highest urban rates, with New England and the Middle Atlantic region having the lowest. Homicides and assaults reached their highest levels in the south; auto theft and burglary were highest on the west coast. The high position of the Pacific states was striking as to all categories except murder and non-negligent manslaughter.

Crimes tend to be relatively more frequent in the larger cities, with diminishing rates as cities dwindle in size. As in 1940, however, Group II cities (with populations from 100,000 to 250,000) dislodged the largest cities from their leading position in 1939, with a clear preponderance for 1941 in five of the eight criminal categories.

The percentage distribution of reportable offenses during 1941 showed larceny with 59·3% of the total, burglary 21·3%, auto theft 11·8%, robbery 3·1%. As from 1937 to 1940, these figures showed an increase for larceny, but relative declines for others. The relative frequency of crimes against the person, however, increased slightly in 1941 as compared with contemporary tendencies. In Table II the per capita rate for the several offenses, during the first three-quarters of 1941, is shown for 2,109 cities, towns and villages, grouped according to size, and with a total population of 64,267,531.

Table II.—*Crime Rates per 100,000 Population*
January-September, Inclusive, 1941

	Population Groups of Cities (000 Omitted)						
	I Over 250	II 100-250	III 50-100	IV 25-50	V 10-25	VI under 10	Total
Murder and Non-Negligent Manslaughter	4.44	5.36	5.38	3.42	2.79	3.11	4.22
Manslaughter by Negligence	3.14	3.03	3.22	2.23	1.67	1.99	2.86
Rape	8.86	5.75	6.70	4.30	5.74	5.95	7.17
Robbery	40.0	34.1	28.5	22.3	16.4	15.4	35.3
Aggravated Assault	30.1	44.8	51.4	30.5	25.8	22.5	36.9
Burglary—Breaking or Entering	278.8	207.2	253.4	224.5	186.0	158.1	245.0
Larceny—Theft	747.6	766.0	760.0	717.7	570.6	401.0	681.8
Auto Theft	155.2	158.8	138.2	126.8	95.1	71.8	135.6

The high relative frequency of larceny invites further details concerning its distribution by amounts involved. Table III shows that the bulk of all larcenies was neither in the petty

Table III.—*Relative Frequency of Larcenies 1938-41*

Value of Property Stolen	Per Cent of Total Larcenies			
	1941	1940	1939	1938
Over $50.00	11.0	10.9	11.8	13.0
$5.00 and under $50.00	65.2	65.0	64.9	65.0
Under $5.00	23.8	24.1	23.3	22.0

nor major categories, but clustered in the range between $5 and $50.

Thefts from automobiles (not including the cars themselves) constituted almost one-third of all larcenies, while bicycles were still a major object of this type of theft in 17·3% of the cases.

Burglaries in 1941 also showed certain well defined characteristics; 75·7% of them were committed at night, although here nonresidence burglaries showed a more pronounced frequency (88·2%) than in the case of burglaries committed against residences (62%). Notable, also, was the fact that more than half (52·5%) of all burglaries involved the breaking or entering of structures other than residences.

Highway robberies constituted three-fifths (59·9%) of all robberies. Oil stations were particularly singled out as objects of attack (8·5% of the total), with commercial establishments in general accounting for one-fourth (25·6%) of the general total.

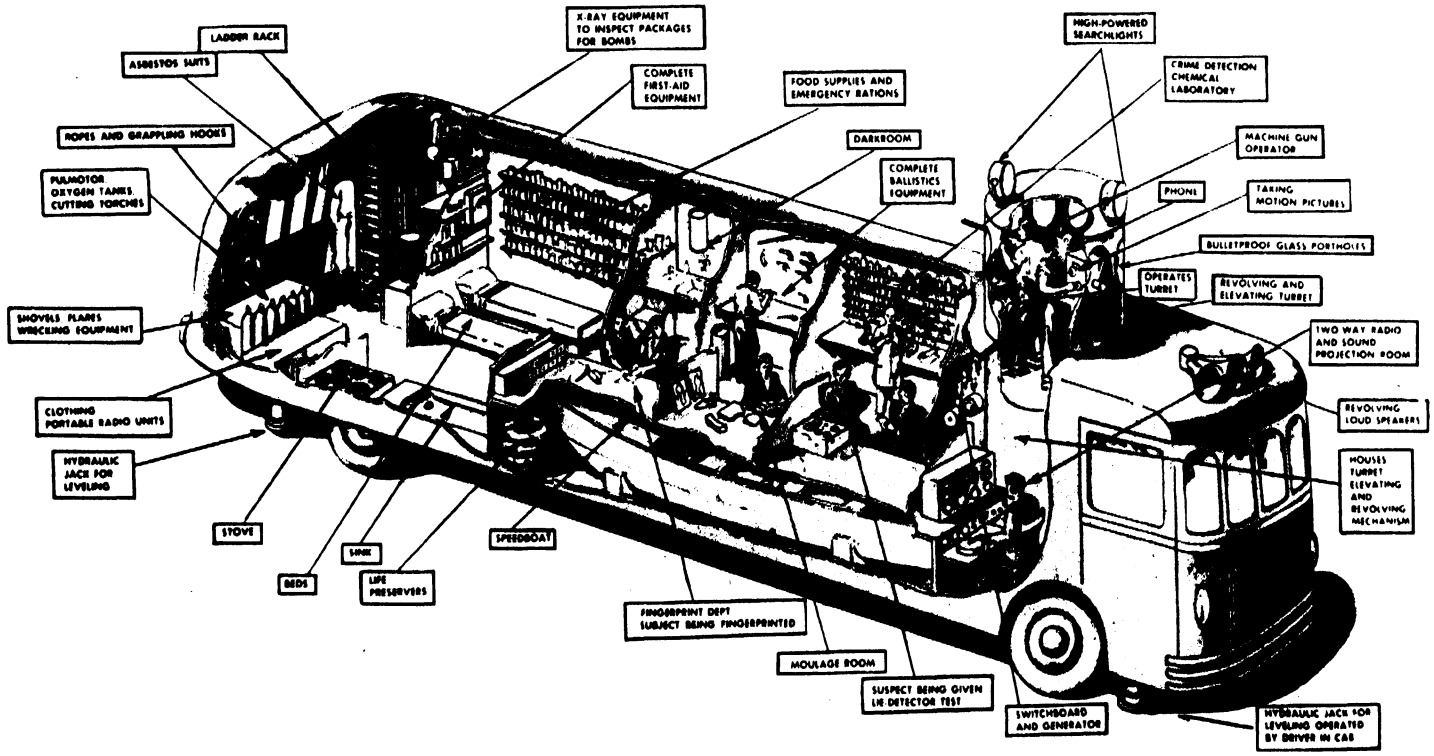
Recoveries of stolen property rose in 1941 to 68%, in contrast with 1940 and 1939, when only 66·5% and 67·2%, respectively, were recovered. Hence 1941 was notable in marking the highest ratio of stolen property recoveries that had been recorded since nation-wide crime figures were available. The percentage of stolen cars recovered rose to 94·7% in 1941, constituting 96·4% of the value of the stolen cars.

World War II.—The advent of war late in 1941 aroused speculation as to its probable effect upon crime rates. During World War I, European experience indicated that criminal offenses declined, and again, following the attack on Honolulu on Dec. 7, 1941, even with its succeeding nightly blackouts, police observed a noticeable falling off in criminal complaints. Whether such phenomena are attributable to temporary changes in social attitudes, to the more rigorous police methods of a wartime society, or to the subjection of the criminally disposed elements of the population to the usual restrictions imposed by military discipline and routine, is far from clear. Some segregation of these possible factors might later be effected. (*See also* FEDERAL BUREAU OF INVESTIGATION; JUVENILE DELINQUENCY; KIDNAPPING; POLICE; SECRET SERVICE.)

BIBLIOGRAPHY.—*Ten Years of Uniform Crime Reporting* (Federal Bureau of Investigation, 1940); *Judicial Criminal Statistics, 1939* (U.S. Bureau of the Census, 1941); *Prisoners in State and Federal Prisons and Reformatories, 1939* (U.S. Bureau of the Census, 1941); *Uniform Crime Reports* (quarterly) for 1940 and for the first three-quarters of 1941 (Federal Bureau of Investigation, Washington, D.C.). (BR. S.)

Great Britain.—No official statistics later than those for 1938 were available, but it was known that there was, except in two categories, a steady reduction in prosecutions for indictable and nonindictable offenses after the start of the war, the latest official figure showing that in its first 12 months this amounted to 12% in the age group 21 and over. Such reduction was largely attributable to the practical extinguishment of unemployment

DIAGRAM of a 29-ft. armoured crime-fighting car begun in 1941 for the Illinois state police. A speedboat, a revolving gun turret, complete crime-detection apparatus and a two-way radio station are items of equipment



(which dropped from nearly 1,500,000 to 92,350 at the end of 1941) and the absorption of men into the armed and defense services and into industry generally; while the large decrease in prosecutions for drunkenness was at least partly accounted for by the great increase in the price of spirits and the considerable decrease in the gravity of beer.

The two categories in which a rise occurred were offenses against wartime regulations and juvenile delinquency (figures not available, Jan. 1, 1942). By the end of Nov. 1941 successful prosecutions undertaken by the ministry of food alone amounted, since the start of World War II, to 34,766 out of a total of 36,972; but when it is remembered that a large number of these convictions were for such offenses as failure to display prices, supplying without correct authority and charging slightly more than the controlled price for eggs, onions or a package of candy, their value as evidence of an increase in criminality in Britain is largely discounted.

The increase in the convictions of juveniles was more serious: although here, again, too tragic a view should not be taken of it, for it was only a small proportion of the young people who had been going astray. The number of children in the age group 14-17 found guilty of indictable offenses during the first year of World War II increased by 22% as compared with 1938–39, while in the age group under 14 the increase was about 41%. This shows a worse position than that during the World War I; but whereas then the main disadvantage experienced by the children was the absence of their fathers and the consequent slackening of discipline in the home, today we must add to this the breakup of home life caused by evacuation, the nervous strain entailed by the heavy "blitzes" and more strenuous war conditions, the absorption of large numbers of mothers into industry, and, in too many cases, the weekly receipt of unaccustomedly large wage packets by the youngsters themselves. (L. H. D.)

Croatia. A newly formed kingdom in the northwestern part of the Balkan peninsula. When Yugoslavia disintegrated under the impact of German aggression at the beginning of April 1941, separatist Croats of the fascist and terrorist organization "Ustasha" set up in Zagreb an independent Croat regime with Dr. Ante Pavelitch as fuehrer or Poglavnik, and with General Sladko Kvaternik as minister of war. Education and propaganda were in the hands of Mile Budak. The Croatian Peasant party which represented under Dr. Matchek the large majority of the Croat people was excluded from a share in the government, and Dr. Matchek himself went into retirement. The new state was quickly recognized by the axis powers. It assumed immediately all the features of a fascist authoritarian regime, and excelled by the special ruthlessness and cruelty with which the small Jewish population and the large Serb minority were persecuted and partly exterminated. On May 15 the restoration of a monarchy in Croatia which had become extinct in 1089 A.D. was officially announced in Rome. The Crown of Zvonimir, the last Croatian king, was now offered to the Italian Prince Aimone, duke of Spoleto, who became King Aimone I on May 17 without, however, having dared to enter his new kingdom by the end of 1941. Long-lasting negotiations about Croatia's frontiers were not yet definitely settled by the end of 1941. The frontier with Germany corresponded generally to the frontier as it existed in 1918 between Austrian Styria and Carinthia on the one hand and the then Croatia on the other hand. While this frontier remained more or less stable, the Italian-Croatian frontier underwent several changes, because Italy wished to include large parts of Dalmatia, which is entirely inhabited by Croats, within her own empire. On May 18 an agreement was signed between Italy and Croatia according to which the larger part of Dalmatia, including the cities Zara, Sebenico and Spalato, the Bay of Cattaro and most of the islands, were ceded to Italy. Croatia promised the complete demilitarization of its small Adriatic zone, while Italy guaranteed the existence and independence of Croatia. Military and economic missions, sent to Croatia, were to enforce Italian control over the independent country. Count Giuseppe Volpi di Misurata, a well known Italian industrialist, was named head of a "permanent mission for Italian-Croat economic collaboration." On June 15 Croatia joined officially the axis alliance at a ceremony in Venice, giving its full adherence to the principles of Italy, Germany and Japan and to the "new order." According to official information released June 18, Croatia had then an area of 115,135 sq.km. with 7,080,000 inhabitants, of whom 5,200,000 were Catholic Croats. The new monetary unit was the kuna of 100 banica, one kuna equalling 0.017921 gram of fine gold. The young kingdom was subject to violent disorders and revolts, and Italian forces frequently had to interfere. On Aug. 23 Italian armies took over complete control of Croatia's entire coastal zone from Fiume to Montenegro to insure "public safety." The lawlessness and cruelties of the "Ustasha" were so great that the Croat government was forced to reorganize it completely. By the end of 1941 Croatia seethed with discontent, relations between Croats and Italians were strained to the utmost, and between Croats and Serbs open and bitter hostilities had been aroused, so that the independence of the kingdom and even its existence were as doubtful as the whole "new order." (*See* also DALMATIA; MONTENEGRO; YUGOSLAVIA.)

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(H. Ko.)

Crop Insurance. With the U.S. winter wheat crop planted in the fall of 1941, the Federal Crop Insurance corporation adopted a new plan for the payment of premiums on insurance of the 1942 crops of wheat and cotton. Farmers insuring 1942 crops were to pay the insurance premium with a commodity note instead of with wheat or cotton or the cash equivalent, as heretofore. By this arrangement the Crop Insurance corporation expected to increase the number of farmers who insure crops and also effect a saving of $1,000,000 annually in the corporation's expense of storing and handling grain. The commodity note, which is a part of the crop insurance application, promises to pay in wheat or cotton or the cash equivalent at maturity. Maturity dates vary in different localities and coincide with the time of harvest and the receiving of AAA payments by farmers. If a farmer fails to pay on time the premium will be deducted from any indemnity due him or from his first government payment. In 1941, it was reported, 95% of all crop insurance premiums was paid through assignment of farmers' AAA payments. The Crop Insurance corporation issued 420,000 contracts on the 1941 harvests. Under the new plan of premium payments the corporation expected to carry very little wheat. Heretofore it carried from 6,680,000 bu. to 14,300,000 bu. Under the new plan a farmer who operates more than one farm in a county or who has an interest in wheat growing on more than one farm cannot, as heretofore, insure only the high-risk crop and elect not to insure a low-risk area.

He must insure all such crops that are in the same county. Applications for insurance on winter wheat must be made before seeding and no later than Aug. 30; on spring wheat, no later than Feb. 28. But, under the new plan, the grower does not have to state the acreage at that time. He may specify the acreage insured later, when he is more certain as to the acreage he may wish to plant. (S. O. R.)

Cruisers: *see* NAVIES OF THE WORLD.

Crushed Stone: *see* STONE.

Cryolite. After the occupation of Denmark by Germany, and of Greenland by the United States, there was little information available on cryolite, aside from the imports into the United States, which more than doubled in 1940, reaching 25,858 long tons, the largest figure on record by a large margin. Since the 1939 output was expected to be 55,000 metric tons, there was still a large balance left after deducting the United States shipments, but nothing was known as to its distribution. Presumably the aluminum industries of Canada and England were being supplied by direct shipments. Since it had been the practice of the former Danish distributors to maintain stocks of some magnitude, it is probable that these fell into German hands. (G. A. Ro.)

Csaky, Stephen, Count (1897–1941), Hungarian statesman and diplomat, was born in Segesvar, Hungary. The youngest foreign minister in Hungary's history, he spent nearly half his life in the foreign service. He embarked upon a diplomatic career in 1921, when he was appointed secretary at the Hungarian embassy in Rome. Three years later he was transferred to the Bucharest embassy, and subsequently held the post of chargé d'affaires in Madrid and Lisbon. In 1934 he was appointed minister to Spain and in 1938 became foreign minister. Csáky, an ardent revisionist, sought the return of territories wrested from Hungary after World War I, and shaped his foreign policy to that end. Convinced that the axis powers were destined to dominate Europe, he voiced vigorous approval of their policies and in return was rewarded in Aug. 1940, when Germany and Italy compelled Rumania to cede half of Transylvania to Hungary. In Nov. 1940 he signed the Rome-Berlin-Tokyo pact and shortly before his death he concluded a treaty of "perpetual friendship" with Yugoslavia. He died in Budapest, Jan. 27.

Cuba. A republic occupying the largest of the West Indian islands; area, 41,634 sq.mi., excluding small neighbouring islands; pop. (unofficial 1941 est.): 4,420,707 (Dec. 31, 1938 official est.: 4,227,597), of whom 68% are white. Capital, Havana, 1938 pop. 568,913. Other principal cities are Camaguey (138,295); Santiago (107,125); Santa Clara (99,509); Marianao (suburb of Havana) (86,435); Cienfuegos (92,258). (Population figures are for municipalities, which usually embrace considerably larger areas than do conventional Anglo-Saxon cities.) The United States has a leased naval base at Guantánamo bay, in eastern Cuba. President, Fulgencio Batista.

History.—Cuba is under constitutional government, with a regularly elected president and a bicameral congress. President Batista, inaugurated in Oct. 1940, successfully weathered, in early 1941, the first contest of his presidential authority, and a short-lived crisis ended without bloodshed. Long-standing friction between the president and high-ranking military leaders, notably Colonel Pedraza, chief of staff of the army, and Colonel Ángel A. González, chief of staff of the navy, reached a climax on Feb. 3, after Pedraza had demanded Batista's virtual abdication. Accepting the challenge, Batista assumed full control of the country's armed forces and, suspending constitutional guarantees, arrested both Pedraza and González and exiled them. The suspended guarantees were restored two days later.

A more serious threat to the presidential will was the continuing congressional criticism and obstruction. First evidence was the refusal of congress to pass the 1941 budget, necessitating extension of the 1940 budget. More extensive was the criticism levelled at the government because of its alleged failure to take adequate measures against profascist elements in Cuba. Centre of this controversy was Genaro Riestra, Spanish consul general, who had earlier been expelled from Mexico on charges of disseminating totalitarian propaganda and was reputed to be the Cuban head of the pro-axis Spanish *Falange*. Subsequently, Riestra was declared *persona non grata* and was asked to leave the country. Similarly, the Spanish commercial attaché was expelled. Francisco Álvarez García, a local leader of the *Falange*, was taken into custody with two others and was charged with antidemocratic activities. Acquittal was won, however, because of insufficient evidence.

Opposition to the axis, following the lead of the United States, was widespread, and Cuba indicated a sincere desire to cast its lot with the United States. In Jan. 1941 Pres. Batista issued a decree designed to curb totalitarian propaganda in Cuba; on Feb. 13 the *Falange* was ordered to close its soup kitchens and welfare agencies, and, three days later, all German and Italian consular officials were ordered to leave the country before Aug. 25. Indicative of strong anti-fascism was the bombing, on Aug. 18, of several Spanish-owned shops, when 12 persons were seriously injured.

Domestic strife in Cuba evinced itself in factional disputes in congress, and in disputes between congress and the president and his cabinet. Obstructionist tactics among opposition congressmen prevented consideration, before the regular session of congress ended May 27, of a number of measures the administration deemed urgent. Pres. Batista therefore called a special session of congress which began, on July 14, to consider tax reforms made urgent by a serious budgetary deficit, and to authorize negotiation of a $25,000,000 loan from the United States Export-Import bank. Meanwhile, congressional opposition arising from patronage disputes led to a shuffling of Batista's cabinet personnel. The new cabinet was top-heavy with 11 old and 7 new members. Its creation failed to quiet the opposition and, on Aug. 4, obstructionist tactics led to a brawl on the senate floor involving some 20 persons. Despite a continuing crisis, the special session approved a general increase of 20% in all taxes before it disbanded. The next regular session, convening Sept. 17, moved to consider approval of the Export-Import bank loan, and on Nov. 21 a law authorizing negotiations for such a loan received presidential approval. Proceeds of the loan were allotted for highway repair and construction and for an agricultural program aimed at diversification and improvement of irrigation facilities.

As a result of a rising cost of living, labour problems were serious in 1941. Early in the year, the opening of the grinding season for sugar was endangered by the strike threat. Labourers insisted that the wage scale established in 1940 should be extended, while growers desired a lower scale. This first controversy was solved by Pres. Batista, who pegged wages at the previous level but provided for a downward scaling of wages, should sugar prices decline. Strikes spread to other industries in the country and, in October, 700 employees of wholesale food and liquor companies walked out when their demands for increased wages were refused. The entire problem of wages in the island came to a head in November, when labourers refused to work in the sugar mills unless they were granted wage increases. Once again Batista intervened, and by decree granted a blanket wage increase of from 10% to 25%.

Throughout the year, relations with the United States continued close, and in November a "lend-lease" agreement was concluded.

ARMY AND POLICE OFFICIALS of Cuba arriving with their families at Miami, Fla. Feb. 4, 1941 after President Batista had exiled them for alleged sedition

Details were not made public but were understood to provide for considerable defense materials to Cuba, with repayment presumably in sugar, tobacco, manganese and other Cuban products. Upon declaration of war against the axis powers by the United States in December, Cuba immediately followed with similar declarations.

Education.—Education is under national control. There were, in 1941, nearly 5,000 primary schools, with close to 500,000 enrolment. The 1942 budget allotted $16,308,000 to education, 18.1% of the total.

Defense.—Cuba has a peacetime army of 8,000, a rural guard of 6,000, and 48,000 reserves. During 1941, steps were taken to increase greatly the military establishment. The navy comprised two vessels in 1941. The 1942 budget provided $15,794,000 for national defense.

Finance.—The monetary unit is the peso, theoretically equal in value to the U.S. dollar. In 1940, the exchange rate averaged approximately 90 cents U.S., but during 1941 it gradually improved, reaching par in September. The 1942 budget anticipated revenues of $89,960,000 and expenditures of $89,956,000. Nearly a third of the national revenues was expected from customs duties, and a third from excise taxes. The 1941 budget, as subsequently adjusted, provided for $78,742,000. Actual revenues to Oct. 25 were $61,703,000, and a deficit of less than $3,000,000 was forecast. The national debt in 1940 was $135,905,000, of which $107,261,000 was external. The 1942 budget allotted $10,786,000 for public debt service.

Communication.—Cuba has numerous good ports, the most important being Havana and Santiago. Regular and frequent external steamer communication is maintained, with daily service from Key West, Fla. Havana is on the main route of the Pan American airways. International air traffic through the country continued to increase in 1941. Both passengers and express increased markedly, by 25% and 32% respectively, although mail volume decreased by 4%. Internal air transport facilities are excellent. Land communication is by a 3,850-mi. railway system (including 250 mi. electric), based on an east-west trunk line, and by a network of 2,500 mi. of improved highways, principal of which is the 706-mi. Central highway from Havana to Santiago. In mid-1941, motor vehicle registration was 48,324, including 29,323 passenger cars, 3,079 buses and 15,496 trucks. Telephone and telegraph facilities (52,740 telephones and 10,939 mi. of telegraph lines in 1939) are superior to those of any other western hemisphere country except the United States and Canada. There were 54 radio broadcasting stations in 1941.

Trade and Production.—Cuba's imports comprise chiefly foodstuffs, machinery and miscellaneous manufactured goods. In 1940 imports declined nominally to $103,860,000 (1939: $105,862,000), with the United States supplying 78%, Great Britain 34%, British India 2.9% (largely jute bags) and Curaçao 2.1% (petroleum). Imports during the first eight months of 1941 were 16.8% greater, with the United States providing most of the additional values.

Exports totalled $127,288,000 in 1940 (1939: $147,676,000), the lowest since 1934, 82.4% to the United States (1939: 75.3%), 7.8% to Great Britain (1939: 12.2%). In the first nine months of 1941, export values increased 47%, of which a considerable part represented British purchases of sugar and molasses.

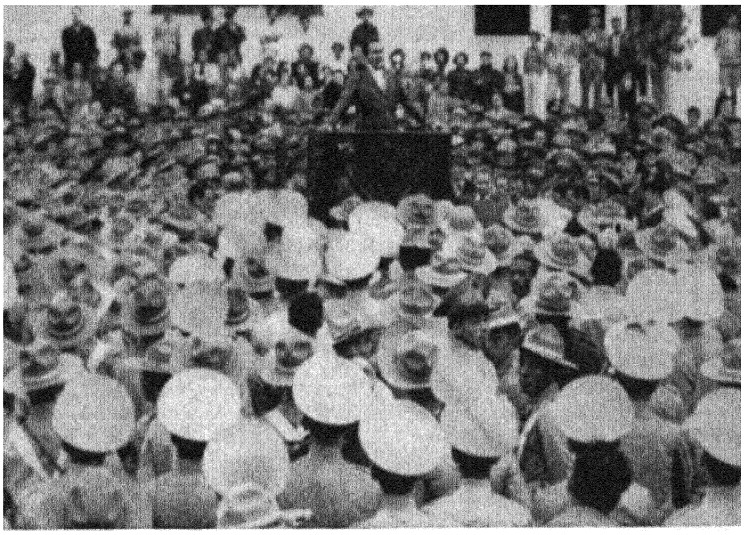
Sugar and sugar products aggregated 66.5% of all exports in 1940, against a normal of nearly 90%, with a volume (1,989,192 tons, 1,485,824 tons to the United States) 31% less than in 1938, and 26% less than in 1939. Sugar exports increased 29% in the first nine months of 1941, and stocks on hand fell to 100,000 tons by September. This situation, coupled with an 86% better price, put the Cuban sugar industry in its best position for a decade, and permitted the retirement of most of a United States Export-Import bank loan made in January to cover grinding of an apparent sugar surplus of 400,000 tons. During the year United States sugar quotas for Cuba were raised five times, reaching the highest allotment figure ever attained under the quota system. A price ceiling of 3½ cents, imposed by the United States Office of Price Control, caused vigorous protest, however. Claims were made that duty and freight charges took almost 1½ cents a pound, and a drive was instituted to reduce the United States import duty on that commodity. In November a five-man commission left Havana to negotiate with Washington officials concerning United States plans to buy Cuba's entire 1942 production of sugar, which, it was estimated, would reach a total of 4,000,000 tons. Although such an arrangement would help stabilize the island's economy, many Cuban growers and grinders, foreseeing steadily rising prices on the open market, disapproved the plan.

Other agricultural export commodities include tobacco, fresh fruits (avocados, grapefruit, bananas, pineapples and papayas). Most of Cuba's tobacco goes to the United States, with Spain second.

Mineral Production.—The total mineral output was valued at $11,700,000 in 1940. The leading mineral product is manganese, in which Cuba ranks second to Brazil in Latin America. During the first half of 1941 exports almost doubled. Chromite is also important. Barite ore, copper, iron and gold ore are also exported in small quantities.

Tourist Trade.—The tourist trade, an important Cuban economic asset, declined in 1940, with 127,464 tourists (6% less than in 1939), entering the country. The first four months of 1941, however, showed a recovery. (*See* also WEST INDIES.) (L. W. BE.; L. C. DE A.)

Cudahy, Edward Aloysius, Sr. (1860–1941), U.S. meat packer, was born Feb. 1 in Milwaukee, Wis. He started work in a meat-packing plant at 12 and rose to the position of general manager of Armour's Omaha plant, which became known in 1877 as the Armour-Cudahy company. With his older brother, he bought out the Armour interests in 1890. He took the post of vice-president in the new company and in 1910 he was made president. Cudahy became chairman of the board in 1926 and maintained an active interest in the company. He died in Chicago, Oct. 18.



PRESIDENT BATISTA of Cuba addressing soldiers of Camp Columbia Feb. 5, 1941 after ousting the chiefs of the army and police, whom he charged with sedition

Cunningham, Sir Alan Gordon (1887–), British army officer and gunnery expert, was born May 1 in England. A student at the Royal Military academy, Woolwich, he won his commission in 1906 and saw action in World War I in the field and as a general staff officer. After serving as a general staff officer in the Straits Settlements, 1919–21, he returned to England to specialize in machine-gun and heavy artillery problems. In World War II, Sir Alan commanded a British army in Kenya. Assigned the task of smashing Mussolini's legions in Somaliland and Ethiopia, his armies penetrated Italian Somaliland in Feb. 1941 and took Mogadishu, the capital. After a 1,500-mi. drive through African deserts and jungles, his armies entered Addis Ababa April 6, 1941. Sir Alan was then named commander of the British 8th army in Egypt and Libya and, collaborating with British Mediterranean warships commanded by his brother, Sir Andrew Browne Cunningham (*q.v.*), he launched a surprise offensive Nov. 18, 1941, against axis armies in Libya. This offensive started brilliantly, but was slowed by axis counterdrives and on Nov. 26 Sir Alan, who was reportedly suffering from serious overstrain, was granted sick leave and replaced by Major General Neil Methuen Ritchie (*q.v.*).

Cunningham, Sir Andrew Browne (1883–), British naval officer, commander of the British Mediterranean fleet after 1939, was born in Bishop's Waltham, Hants., England. He entered the royal navy in 1898. During World War I, Sir Andrew commanded the destroyer "Scorpion" and staged daring raids against enemy shipping in the Mediterranean. He was a rear admiral in 1933–36, and was made a vice-admiral commanding a battle cruiser squadron in 1937. He was also lord commissioner of the admiralty and deputy chief of the naval staff, 1938–39. In April 1940 Sir Andrew, aboard his flagship "Warspite," led a destroyer flotilla into Narvik fjord and sank seven German destroyers. Except for the Narvik battle, he had most of his naval experience in the Mediterranean, of which he is said to know every bay and inlet. In Nov. 1940 Sir Andrew's fleet raided the Italian naval base at Taranto, and crippled three Italian battleships. He commanded the victorious British fleet at the battle of Cape Matapan March 28, 1941. On Nov. 18, 1941, he teamed up with his brother, Sir Alan Gordon Cunningham (*q.v.*), commander of the British 8th army, to launch a combined land, air and sea drive against axis units in Libya.

Curaçao, a Netherlands colony in the Caribbean, including Curaçao, Aruba and Bonaire islands in the Leeward group, off the coast of Venezuela, and Saba, St. Eustatius and the

southern part of St. Martins in the Windwards. The colony's area is 436 sq.mi. (Curaçao, 210 sq.mi.; Bonaire, 95 sq.mi.; Aruba, 69 sq.mi.; St. Martins, 17 sq.mi.; St. Eustatius, 7 sq.mi.; Saba, 5 sq.mi.). Population: 101,021 (1938 official est.), mostly on Curaçao (62,798) and Aruba (28,155). Religion: predominantly Roman Catholic; language: officially Dutch. Capital: Willemstad, on Curaçao, pop. 30,453. Government is in the hands of an appointed governor and a council, a majority of which is elected. Governor: G. J. J. Wouters.

History.—Wartime activity continued to dominate the scene in Curaçao throughout 1941, with the expansion of already extensive petroleum refining facilities and adjustment to the transfer to Willemstad, in 1940, of the general headquarters of the Royal Dutch Shell company. Building construction was especially active, with one of the more notable projects a 600-ft. ship drydock. Defenses, including air-raid shelters, were steadily extended as handling of petroleum for war needs made Willemstad one of the busiest war ports in the world.

Education.—There were 49 schools, with 11,044 pupils, in 1938.

Finance.—The monetary unit is the guilder, valued at 52½ cents U.S. in 1941.

Trade and Industry.—Refining of crude petroleum (chiefly from Venezuela) on Curaçao and Aruba, where two of the world's three largest refineries are located, dominates the colony's economy, and accounts in peacetime for a full 99% of all export values. One single refinery employs some 5,000 persons.

No statistics of petroleum refining or trade are made public in wartime. Total United States-Curaçao trade figures are, however, available. In 1938 the value of Curaçao's total trade was: exports, 340,545,295 guilders; imports (80% petroleum), 391,130,826 guilders. Some 75% of all imports come formally from Venezuela, most of the remainder from Colombia, with miscellaneous goods supplied by the Netherlands (to May 1940) and the United States. In 1940 imports other than petroleum totalled $25,088,000 (1939: $27,062,000), 67% from the United States (1939: 63%); exports other than petroleum products $9,445,000 (1939: $8,981,000). All imports from the United States were valued at $21,682,661 (1939: $38,378,314); all exports to the United States $19,517,346 (1939: $19,722,938). During the first eight months of 1941 imports of United States origin totalled $9,949,668; a 37.6% decline, while exports to the United States were valued at $29,015,397, a 91.8% increase.

The principal resource of domestic origin in the larger islands is phosphate; Saba and the other islands in the Windward group are of almost no consequence economically, producing small quantities of fancy textiles and miscellaneous agricultural products.

Communication.—External and interisland communication is by steamer. Curaçao itself and Aruba have frequent air service. Normally an average of more than 41 ships daily clear from ports of the colony, with the total greatly enlarged under war conditions, because of refuelling facilities. (*See* also HISPANIC AMERICA AND WORLD WAR II; WEST INDIES.) (L. W. BE.)

Curling. The successful defense of the Gordon International medal by Canadian curlers was the chief development during the 1941 season. The dominion's rinkmen won 13 of the 19 matches with the U.S. curlers, scoring 272 to 210. R. H. MacNabb of Ottawa, Ont. and E. Hamel of Three Rivers, Ont. set the pace for the Canadian rinks. The Gordon Grand National and the Richard S. Emmet Memorial medals went to the Schenectady Curling club, on whose ice the tournaments were held. The rink skipped by R. D. Thomson gained its third consecutive Gordon title by downing Mahopac in 16 ends.

The Ardsley, N.Y. rink, skipped by George B. Ogden, won the Allen medal, defeating the Utica (N.Y.) rink, skipped by Robert Davies, retiring Grand National president. Campbell Patterson's Country Club rink from Brookline, Mass., won the Country Club cup. (J. B. P.)

Currency: *see* COINAGE.

Curtin, John (1885–), Australian statesman, born Jan. 8 at Creswick, Victoria, Australia. Educated in the state schools, Curtin later became actively engaged in politics and labour journalism. As general secretary of the Victorian Timber Workers' union, 1911–15, and editor of the *Westralian Worker,* 1917–28, he became an exponent of the Australian Labour party's dual traditions of nationalism and theoretical socialism. During World War I, he was secretary of the anti-conscription campaign. In 1924 Curtin was a delegate to the International Labour conference; in 1927–28, a member of the Commonwealth royal commission on family allowance; in 1929–31, a member of the joint committee on public works; and in 1931–34, state advocate for Western Australia to the Commonwealth Grants commission. He was also a member of the Australian house of representatives, serving from 1928 to 1931, and again from 1934 to 1941. During the latter period he was leader of the Federal Labour party and the parliamentary opposition. He succeeded Arthur Fadden (*q.v.*) as prime minister of Australia Oct. 3, 1941. Curtin, in a message sent Dec. 24, 1941 to the Roosevelt-Churchill war parleys in Washington, blamed Allied reverses in the far east on the Anglo-U.S. tendency to underestimate the power of the Japanese air force. On Dec. 27, 1941, he further declared that Australia relied chiefly on the United States in the war against Japan.

Cycling. For the second consecutive year there was no six-day bicycle race held in New York, although this event was one of the internationally famous cycling classics annually for many years previous. The reason for the cancellation was the fact that the majority of the riders were of foreign birth and were occupied in matters of war in their native countries.

There was no competition for world titles for the same reason. In the United States three governing bodies staged title events—the Amateur Bicycle League of America, the National Cycling association and the Century Road Club of America.

The N.C.A. sprint championship was won by Tom Saetta of Brooklyn, while Mike DeFilipo of Newark won the paced title. The A.B.L. senior road championship was won by Marvin Thomson of Chicago, and the junior title went to Andrew Bernadsky of San Francisco. The girls' champion was Jean Michels of Chicago.

The track championships of the A.B.L. were won by Bob Stauffacher of San Francisco who triumphed in the senior class, and Chuck Edwards of Chicago winner among the juniors. Stauffacher also captured the Century Road club's senior title.

The A.B.L. of America selected an all-American cycling group as shown in the table.

Name	*City*	*Points*
George Hurlburt, Jr.	Buffalo	275
Furman Kugler	Somerville, N.J.	195
Jerry Kandler	Milwaukee	190
Iggy Gronkowski, Jr.	Buffalo	115
George Woof	San Francisco	98
Johnny Weber	Milwaukee	85
James Dolle	Irvington, Ind.	84
Isamer Fiyuyama	Honolulu	79
George Edge	Philadelphia	74
Harry Naismyth	Somerville, N.J.	67
Bruce Burgess	Irvington, Ind.	65
Francis DeCabe	Honolulu	64

There was an international bike race over the Inter-American highway from Tegucigalpa, Honduras, to Guatemala City. The Guatemala team won with Fraterno Vila, 18-year-old star, pedalling at the rate of 15 m.p.h. Tommy Hayes of Dallas, Texas won the seventh annual national 100-mi. motorcycling championship, winning in the amazing time of 1:15:46.51.

The six-day bike race which was held in Montreal, Canada, was won by the team of Angelo DeBacco of Newark, N.J., and Rene Cyr of Montreal. Second place was taken by the popular team of Jules Audy of Montreal and Cecil Yates of Chicago. (T. J. D.)

C.Y.O.: *see* CATHOLIC YOUTH ORGANIZATION.

Cyprus: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Czechoslovakia. Formerly a republic in Central Europe, dismembered in 1938–39 as a result of German aggression. The largest part of Czechoslovakia passed under German administration, either as an integral part of Germany like the Sudetenland or as a "protectorate" (*see* Bo-

HEMIA AND MORAVIA). A smaller eastern part became part of Hungary (*see* RUTHENIA), and the part inhabited mainly by Slovaks was established as a nominally independent state in alliance with Germany (*see* SLOVAKIA). The area of Czechoslovakia had been 54,244 sq.mi. with a population of 14,729,536, census Dec. 1930.

History.—In spite of dismemberment the Czechoslovaks continued to hope and to work for their national resurrection; the war strengthened their expectation that Czechoslovak democracy and independence would be restored. The ruthless oppression in Czechoslovakia and the many executions and reprisals only strengthened this will. On July 24, 1940, a provisional Czechoslovak government was formed in London under Dr. Eduard Beneš as president and was officially recognized by the British government as the legitimate government of Czechoslovakia. After the outbreak of the war with the soviet union, the soviet government as well as the British government recognized full governmental status for what had been only the "provisional" Czechoslovak government. Prime minister in 1941 was Monsignor Jan Šrámek, leader of the Catholic party amongst the Czechs; foreign minister was Jan Masaryk, and among the members of the cabinet there were both Czechs and Slovaks. A "national committee" was formed to prepare drafts for legislation, under R. Běchyne, a Social Democrat, as speaker and Milan Hodža, a right-wing Agrarian, as deputy-speaker.

On Oct. 27, 1941, Jaromir Nečas was appointed minister of reconstruction and public works.

Meanwhile the underground struggle was carried on throughout former Czechoslovakia in contact with the government established in London. Underground papers, like *V Boj*, found a wide circulation, and on Sept. 12 a secret Czechoslovak National Revolutionary committee was organized and started a movement to boycott the German-controlled press, thus reducing considerably the sale of newspapers.

The Czech workers in the important armament factories applied the "go slow" tactics. A number of train wreckages was reported. While new German schools were opened throughout all the former Czechoslovakia the number of Czech schools, especially of Czech high schools, was severely curtailed, hundreds of elementary schools were closed, and only slightly more than a third of Czech children finishing elementary schools were allowed to enter high schools.

The Czechoslovak government meanwhile laid the foundations for building up a new postwar order in the Danubian basin which would assure liberty, equality and security to all the peoples living there. The beginning was made by an understanding with Poland about future Polish-Czechoslovak co-operation, which was the more remarkable because the hostile attitude of Poland to Czechoslovakia in the 20 years preceding World War II facilitated the German conquests of both countries. In Feb. 1941 representatives from both sides were appointed to co-ordinate all political, legal, economic, financial, defense and cultural activities. On Nov. 3, 1941 the delegations of Czechoslovakia, Poland, Yugoslavia and Greece to the conference of the International Labour organization in New York city made public a joint declaration announcing the formation of the bloc of the four nations to serve as the basis for a larger confederation of peoples from the Baltic to the Aegean after the war. This confederation would embrace a population of 100,000,000 for common political, economic and social objectives. Jan Masaryk, the Czechoslovak foreign minister, declared that this plan showed clearly that the Central European and Balkan countries realized the importance of starting to prepare for a better future.

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D'Abernon, Edgar Vincent, 1ST VISCOUNT (1857–1941), British diplomat, was born Aug. 19 at Slinfold, Sussex, England and was educated at Eton. While ambassador to Germany, 1920–26, he advised President Hindenburg on economic and financial policy. He bitterly opposed the postwar policy of saddling Germany with reparations and was deeply distrustful of Allied statesmen in their efforts to refashion Europe at conference table parleys. Viscount D'Abernon headed the economic mission to Argentina and Brazil, 1929, and he was chairman of the Medical Research council, 1929–33. Among his works are: *A Grammar of Modern Greek* (1881); *An Ambassador of Peace* (3 vols., 1929–31); *The Eighteenth Decisive Battle of the World* (1931); *The Economic Crisis—Its Causes and The Cure* (1931) and *Portraits and Appreciations* (1931). Viscount D'Abernon died at Hove, Sussex, Nov. 1. (See *Encyclopædia Britannica.*)

Dahomey: *see* FRENCH COLONIAL EMPIRE.

Dairying. The U.S. production of milk and practically all dairy products (with the possible exception of butter) was higher in 1941 than in 1940; it also exceeded the ten-year (1930–39) average. On Sept. 25, 1941, Claude R. Wickard, secretary of agriculture, asked that production of milk and cheese be still further increased in order to assure adequate supplies to Britain, under the provisions of the lend-lease act. To help accomplish increased production, the government announced that arrangements would be made with the Supply Priorities and Allocations board for sufficient equipment to provide for modest expansion in cheese and evaporated milk co-operatives approved by the agricultural marketing administrator. A similar arrangement would also be made to aid privately owned plants.

A number of plants that ordinarily manufacture only butter, or chiefly butter, also began manufacturing cheese or evaporated and dried milk in 1941 to help meet the government's increasing demand for these products. On Aug. 31, 1941, Secretary Wickard said $1,000,000,000 would be required for purchases of food for Britain from that date to Feb. 28, 1942; of that amount one-third was for dairy and poultry products. About 200,000 long tons of lend-lease food per month was being shipped to Britain, he said. Previous to Aug. 31, a total of about 420,000 long tons had been shipped. (For production and shipping details *see* BUTTER; CHEESE; MILK.)

The department of agriculture estimated that the number of cows on U.S. farms would be nearly 26,000,000 in 1942. During 1941, milk production per cow was the largest on record. Rising prices for milk and a favourable feed ratio induced farmers to feed more heavily and also to retain in milking herds low producers that ordinarily would have been culled. Since butter production in 1941 did not follow its normal annual increase but remained practically stationary, and since the big demand was for cheese and for evaporated and dried milk, milk was largely diverted from the usual channels to cheese factories and condenseries. This diversion, however, was spotty and was heaviest in east north central states, where creamery butter production in the week ending Dec. 4, 1941, for example, was 12% below the same week in 1940. In the west north central states, where condenseries and cheese factories have capacity for only a small part of the milk produced, butter production was 1% above the same week in 1940. Many farms, however, could not divert milk from butter production because their practical operations are based on selling butter fat and retaining the skimmed milk to feed to pigs, calves and chickens. The production of farm-made butter was expected to continue the steady decline that set in some years ago. (S. O. R.)

Dakar. A Vichy French port of enormous strategic importance, Dakar is the capital of French West Africa (Pierre Boisson, governor general). The town is situated in 14°40′ N., 17°24′ W., on the eastern side of the peninsula of Cape Verde, the westernmost point of Africa. It is only 1,620 nautical miles from Natal, Brazil, and is the African terminus for the German and Italian air lines to South America. The population prior to World War I was 33,673, of whom 2,939 were Europeans. Estimates of its population in 1941 varied widely, some saying that it had 75,000 inhabitants, of whom 10,000 were Europeans. The climate is very hot, but the town has a good water supply. Dakar is also the seat of a bishopric and is connected by railway to St. Louis, Senegal, distant 130 mi. The French government continuously improved the naval fortifications and facilities at Dakar in 1941, and 128,000,000 francs were allocated Sept. 4, 1941 for this purpose and for the completion of the trans-Saharan railroad.

On Sept. 23–25, 1940, an amphibian battle was fought at Dakar. The British and Free French had two battleships, four cruisers, six destroyers, and several transports, carrying a force of 8,000–10,000 men. The expedition finally sailed away, just when, it is said, Dakar was on the point of surrender.

The harbour, the best between Casablanca, Morocco, and the Cape of Good Hope, is formed by two jetties, 6,840 and 1,968 ft. long, respectively. The entrance to the harbour is 720 ft. wide. The inside harbour was dredged to a depth of 33 ft. in 1936. There is a drydock 656 ft. long by 92 ft. broad, which will accommodate vessels of 10,000 tons. There is also a naval arsenal, and a torpedo-boat basin. During 1941, covering fortresses on Cap Manuel and the isle of Gorée were much strengthened, and the garrison at Dakar was re-enforced.

There were continuous rumours in 1940–41 that Dakar was being used by Germany as a submarine base, and that German technicians and "tourists" were there, but these allegations were consistently and emphatically denied by the Vichy French authorities. On May 15, 1941, President Roosevelt stated that the German use of French West African bases would create a menace for the new world, and in his fireside chat of May 27 he said that the nazi "threat extends . . . also to the Atlantic fortress of Dakar. . . ."

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Dalmatia. A former Yugoslav province on the northeastern shore of the Adriatic sea, inhabited by Croats, Dalmatia came under Italian control as a result of Yugoslavia's collapse under German aggression in April 1941. On May 20 Dalmatia, divided into the three provinces of Zara, Split and Cattaro, became an Italian province under Giuseppe Bastianini, former Italian ambassador to London, whose residence was to be in Zara. Some Dalmatian islands were incorporated into the Italian province of Fiume. By this acquisition Italy gained important ports, of which Cattaro and Sebenico represented excellent naval bases. According to the original agreement of May 18 between Croatia and Italy, certain parts of the Dalmatian coast with Ragusa as the most important city remained under Croatia, but in August the whole Dalmatian territory was occupied, from Fiume in the north to Montenegro in the south, by the Italian army, and the whole system of communications, railroads, telegraph and telephone, was put under military control. For the Croatian territories a Croatian civilian commissar was named with the rank of a minister, to assist the Italian military commander. But the Croatian population of Dalmatia did not acquiesce in the Italian occupation of the land. Many Italian soldiers were killed and wounded in guerrilla attacks, and the Italians started reprisals by executions and even by the seizure of hostages, though on the whole the Italian regime was milder than the similar German and Croat regimes of other parts of former Yugoslavia. With practically the whole Dalmatian coast in Italian hands, only one outlet to the Adriatic sea was left to Croatia, at Ragusa or Dubrovnik. The Italians, who had tried in vain to acquire Dalmatia after World War I because Woodrow Wilson did not wish to abandon this purely Slavonic land to Italy's domination, had thus come into the possession of a strategically important "fifth shore" to which they claimed historic connections from the time of the Roman empire and of the Venetian republic. (*See* also CROATIA; MONTENEGRO; YUGOSLAVIA.) (H. KO.)

Dams. In 1941, throughout the world, heavy guards were placed at dams of water power and water supply developments vital to important industrial areas, while additional developments have been rushed to completion. Meanwhile, the United States continued and initiated new construction on major irrigation and flood control projects, involving the largest dams in the world. The table on p. 212 includes only 20 of the many important dams completed or under construction during 1941.

At Grand Coulee in the United States, the world's largest concrete dam was 99% complete at the close of 1941, and the reservoir was filled. Development of power by the first of the 18 world's largest (108,000-kw.) hydro-electric generators was commenced on March 22.

Shasta, second largest concrete dam, part of the great Central Valley project in California, had 2,210,000 cu.yd., or over one-third, of its concrete in place on Nov. 13. At the other major feature of this project, Friant dam, world's fourth (Boulder is third) largest concrete dam, more than 2,000,000 cu.yd. of concrete were in place, and storage of water was begun on Oct. 20.

On the North Platte river, the Kingsley earthfill dam, second largest (Fort Peck is largest) dam in the world, was dedicated on July 12.

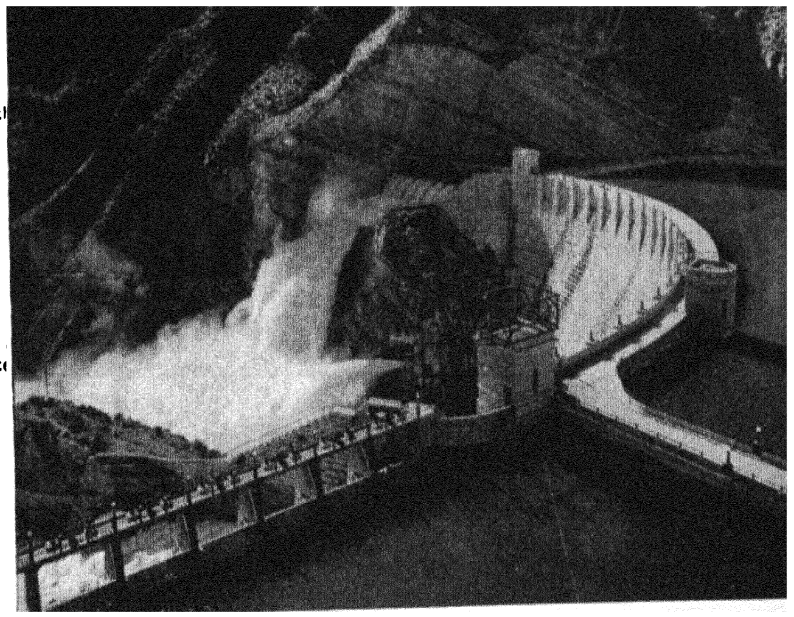
The Stevens dam, highest earth and rock fill dam in the world, was practically complete at the close of the year. Unique in the history of dam construction were the steps taken to secure the desired moisture content for proper construction of the earthfill in the core of this dam. Because of the wet climate and the wet nature of the material in the borrow pit, particularly during the rainy season, it was necessary to pass the core material through huge revolving drums heated by 1,000-h.p. oil burners, three of these units being used, treating as much as 200 cu.yd. per hour. A huge tent, 280 ft. by 196 ft., was erected over the central section of the dam to protect the dried material from the heavy rainfall.

In the Tennessee valley, work was rushed on a number of dams to provide more power for war industries. Glenville, a 150-ft.-high earthfill dam, containing 1,300,000 cu.yd., was placed in operation on Oct. 13. The dam was built in less than a year.

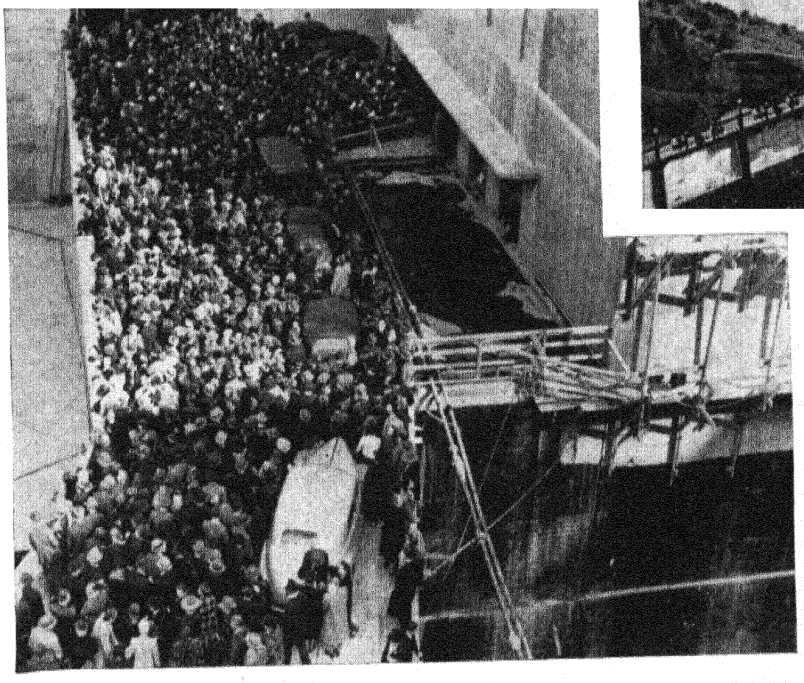
Central and South America.—Irrigation projects were continuing in Central and South America. The San Felipe dam on the Conlara river, an 85-ft.-high hollow buttressed concrete structure, was completed by the Argentina national irrigation directorate. La Angostura, 291-ft.-high arch dam, first of several extensive projects of the Mexican national commission of irrigation, was completed.

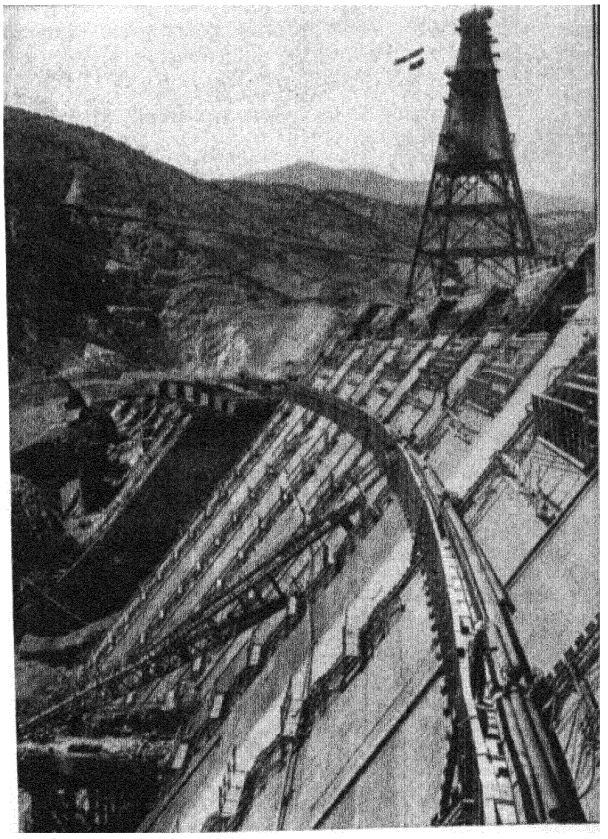
Europe.—European activities stressed hydro-electric developments. In Latvia, a 50-ft.-high earth and concrete dam, 8,500 ft. long, was under construction for a 102,000-h.p. development on the Dwina river. On a number of projects known to have been started during 1938 and 1939 to develop power in Austria for transmission to German industrial centres, and scheduled for completion in 1941, it was not known what progress had been made. However, it was known that the first of seven 100,000-kva. generators, largest yet built in Europe, for the plant at the Yalu river dam being constructed on the Manchoukuo-Chosen border

Right: THE RESERVOIR of Roosevelt dam in Arizona was filled to tl overflow point in the spring of 1941 for the first time in 21 years

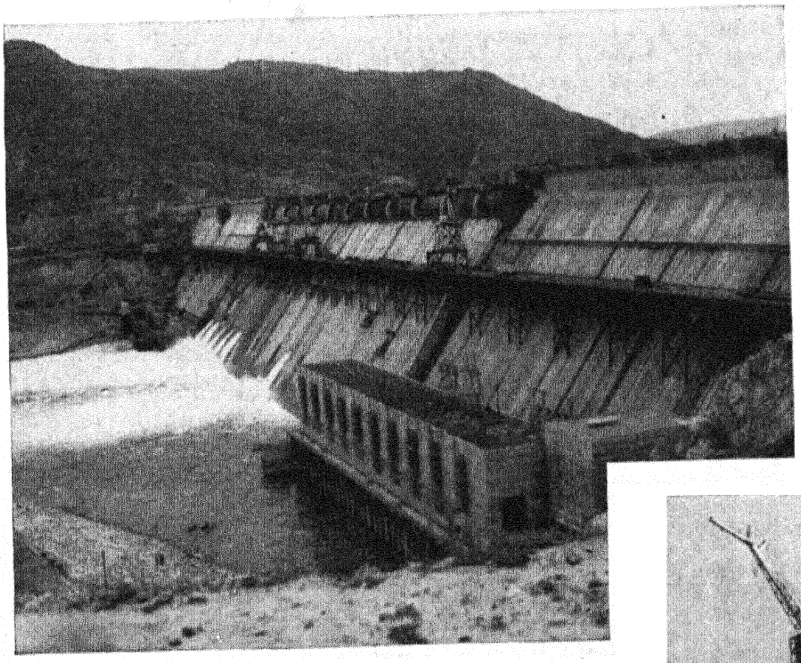


Below: A CROWD OF 10,000 waited to inspect the power plant Grand Coulee dam, Washington, after the first generator was start March 22, 1941, two years ahead of schedule



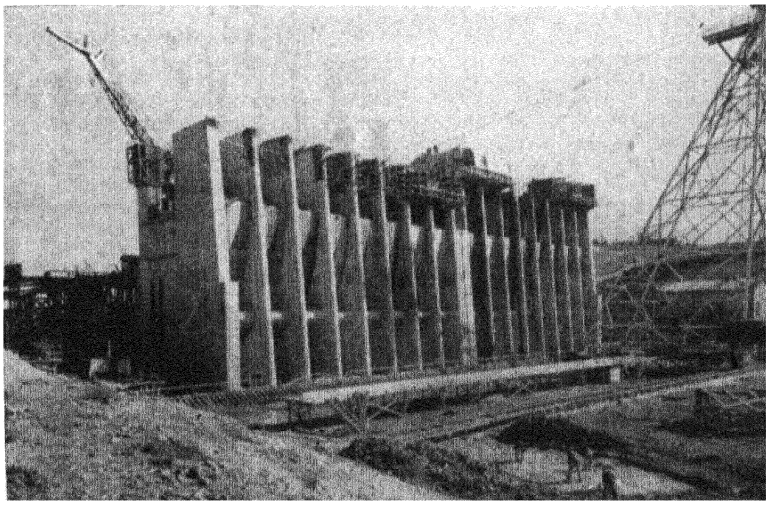


Above: WORK IN PROGRESS on the downstream face of Shasta dam on the Sacramento river, Calif. in Sept. 1941



Above: GRAND COULEE DAM as it appeared March 22, 1941, the day it delivered its first electrical power

Right: INTAKE STRUCTURE of Denison dam, Tex., under construction in 1941 on the Red river



Chief Dams Completed or Under Construction During 1941

Name of Dam	River	Place	Type	Maximum Height, Feet	Crest Length, Feet	Volume (Cu. yds.)	Purpose*	Built by	Progress*
Anderson Ranch	Boise, S. Fork	Idaho, U.S.	Earthfill	330	1,350	9,500,000	I, F, P	U.S. Reclamation Bureau	U
Denison	Red	Texas, U.S.	Earthfill	165	14,000	17,370,000	F, P	U.S. Army Engineers	U
El Azucar	San Juan	Mexico	Earthfill	142	18,000	5,677,031	I	Mexican National Commission of Irrigation	U
El Palmito	Nazas	Mexico	Earthfill	295	1,005	6,632,348	I, P	Mexican National Commission of Irrigation	U
Friant	San Joaquin	California, U.S.	Concrete, straight gravity	300	3,430	2,200,000	I	U.S. Reclamation Bureau	U
Fuihodo	Yalu	Manchoukuo		298	2,730	3,530,000	P	Yalu River Hydro-Electric Co.	U
Grand Coulee	Columbia	Washington, U.S.	Concrete, straight gravity	550	4,300	10,200,000	I, F, P	U.S. Reclamation Bureau	U
Green Mountain	Blue	Colorado, U.S.	Earth and rock fill	285	1,300	4,861,000	I, P	U.S. Reclamation Bureau	U
John Martin	Arkansas	Colorado, U.S.	Earth and concrete gravity	130	14,000	5,915,000 (earth) 220,000 (conc.)	F	U.S. Army Engineers	U
Kanopolis	Smoky Hill	Kansas, U.S.	Earthfill	120	15,400	14,700,000	F	U.S. Army Engineers	U
Kingsley	North Platte	Nebraska, U.S.	Earthfill, hydraulic	162	11,000	26,000,000	I, P	Central Nebraska Public Power and Irrigation District	C
La Angostura	Bavispe	Mexico	Concrete Arch	291	515	175,871	I, P	Mexican National Commission of Irrigation	C
Marshall Ford	Colorado	Texas, U.S.	Concrete, straight gravity	270	2,623	1,868,700	I, F, P	U.S. Reclamation Bureau	C
Merriman	Rondout	New York, U.S.	Earthfill	200	2,500	6,600,000	W	N.Y. Board of Water Supply	U
Norfolk	North Fork	Arkansas, U.S.	Concrete, straight gravity	220	2,624	1,470,000	F	U.S. Army Engineers	U
Santa Fe	San Gabriel	California, U.S.	Earthfill	92	24,100	12,030,000	F	U.S. Army Engineers	U
Shasta	Sacramento	California, U.S.	Concrete, straight gravity	560	3,500	5,400,000	I, F, P	U.S. Reclamation Bureau	U
Stevens	White	Washington, U.S.	Earth and rock fill†	425	700	2,109,000	F	U.S. Army Engineers	C
Wolf Creek	Cumberland	Kentucky, U.S.	Earthfill and concrete gravity	..	..	9,200,000 (earth) 1,200,000 (conc.)	F, P	U.S. Army Engineers	U
Woronora	Woronora	New South Wales	Concrete, curved gravity	217	1,300	434,000	W	Sydney Metropolitan Water Supply, Sewerage and Drainage Board	C

*I—Irrigation, C—Completed in 1941, U—Under construction, F—Flood control, W—Water supply, P—Power. †Highest in world.

was completed in Germany during the year.

On Aug. 29, the Russians reported the destruction of their great dam on the Dnieper river in an effort to thwart the advance of the German armies, and prevent its use should the great power plant fall into German hands. The dam, a 110-ft.-high, 2,500-ft.-long, curved spillway of gravity section, was completed in 1932. The development was built under the supervision of engineers from the United States, and had a capacity of 746,000-hp. (*See* also AQUEDUCTS; IRRIGATION; WATER POWER.) (W. P. C.)

Dance. **Ballroom.**—Social dance trends in 1941 followed closely the turn of world events. The popularity of social dancing increased in proportion to its service as a safety valve for accumulative nervous tension and pent-up energy. Paralleling the "dance craze" of 1914–19, the rash of dance trends produced, in 1941, a diversity of motifs and styles, each stemming from some aspect of the social scene.

In 1941 Latin dances enjoyed even greater popularity than they had in the two previous years. One result of United States Good Neighbor policy in 1941 was an unprecedented rush of Americans to dancing classes for professional instruction in Latin-American dance rhythms, the Arthur Murray schools alone enrolling more than 800,000 students at 45 centres throughout the U.S.A. and at leading summer and winter resorts.

The Argentine tango fell off slightly during the year, its languid and sophisticated rhythms seemingly unsuited to the frenetic tempo of the time. The conga, of Afro-Cuban origin, sustained the popularity it had achieved in 1940, but it was considerably retailored to fit living room and crowded public dance floor limitations. Whereas the conga had risen to fame as a vigorous line dance, in 1941 it was more widely performed by separate couples, thus allowing more people on the same dancing area at one time. The one-two-three, kick, pattern was altered to a one-two-three, pause, retaining favourite "breaks" in which the separate partners might execute steps and improvisations as simple or as intricate as they wished.

The ballroom rumba, a refined version of the Cuban danzon, increased in favour. But, if any one dance could be termed the "dance of the year," the approbation must go to the Brazilian samba which soared to popularity during 1941. Like the rumba, the samba is danced by couples in a two-four step pattern with an accented musical accompaniment. Like the rumba, the samba comprises much hip and knee movement. But, where the rumba calls for a syncopated pause on the fourth beat, the samba institutes a lift of the torso, producing a sense of greater airiness and bounce, again in keeping with the tempo of the time.

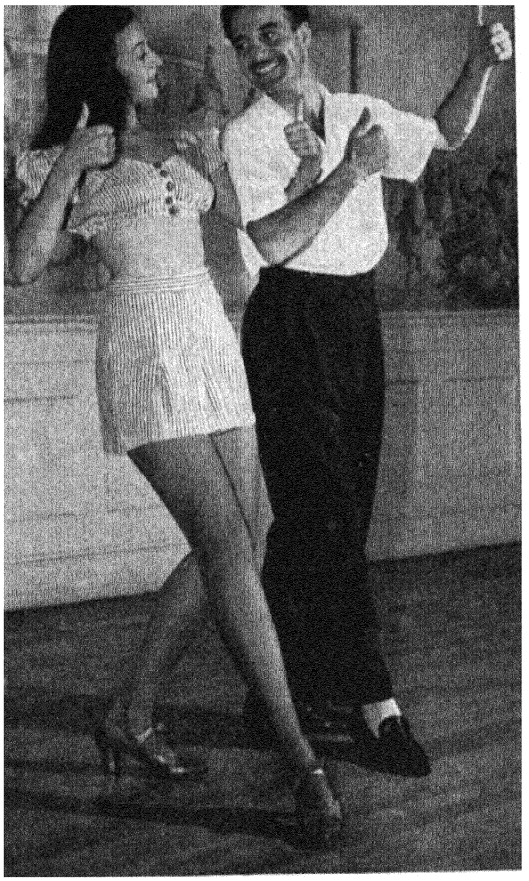
The Congeroo, a combination of jitterbug and conga, had a short-lived popularity in the east during the early months of the year. But on the whole 1941 saw the jitterbug style of dancing lose much of its abandon. The trend toward sophisticated swing music gave rise to a refined version of jitterbug dancing which was accepted at the better hotel ballrooms and sanctioned by army morale divisions and defense recreation authorities.

American folk and group dances followed an upward swing in popularity. Square and barn dancing moved in from the country and played an important role in the recreation activities of urban groups. Great numbers of square-dancing centres were established during the year and polished floors and mirrored ballrooms resounded with the callers' admonitions. Game dances, too, continued to remain part of this trend, providing new variation for such fad dances as the Big Apple.

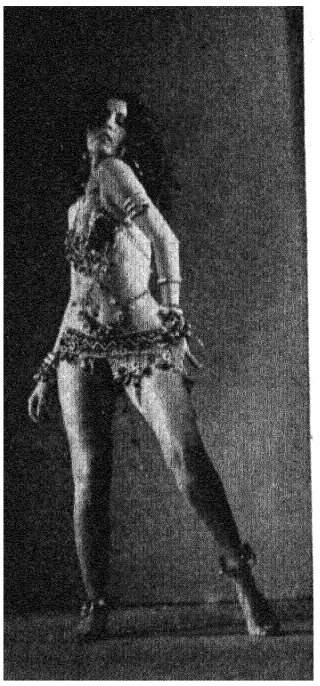
The waltz and fox trot held their customary dominance in the year of multifarious innovations. But even here, the turn of war events brought new forms. In the middle of the year the V for Victory dance was created. Couples danced the fox trot and ended the number in a group figure V. Toward the end of the year came the Thumbs Up dance. This entailed a line of open couples following a leader and swinging their arms alternately to the left and right, pointing their thumbs upward.

The close of the year witnessed the introduction of many dance novelties, the most unusual of which was the Double-Partner waltz. The decrease in the number of civilian men called for a dance which would utilize a maximum number of women for the number of available men. The Double-Partner waltz is danced by groups of three—one man and two women. (A. MU.)

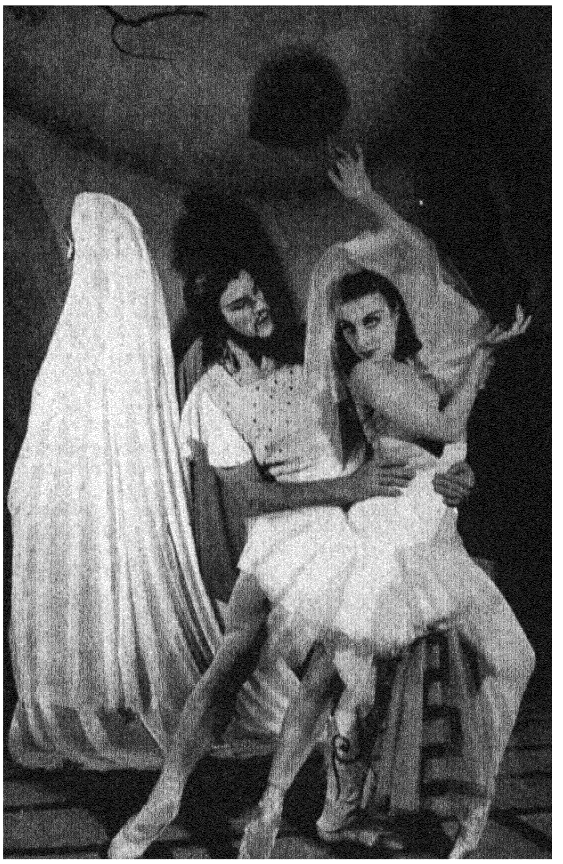
Folk Dancing.—Throughout large rural areas, in many schools and colleges and in some cities and towns, the pioneer American forms were the favourites, brought up to date by the spirit, enthusiasm and creativeness of the dancers. It was seldom called "folk" dancing but rather, according to local usage, square dancing, pioneer dancing, set-running, play-party, twistification, junket, sugar-on-the-floor, string or country dancing or quadrilles. In some cities or in areas where industry or farming caused a concentration of "nationality" peoples, especially those of the later immigration period, folk dances of other lands might predominate or be danced with equal enjoyment beside the American forms.



PROMENADE STEP from the "Defense Swing," a dance named in honour of U.S. selectees and introduced at the 1941 convention of the Dance Educators of America. It is performed to the tune of "Yankee Doodle" in swing time

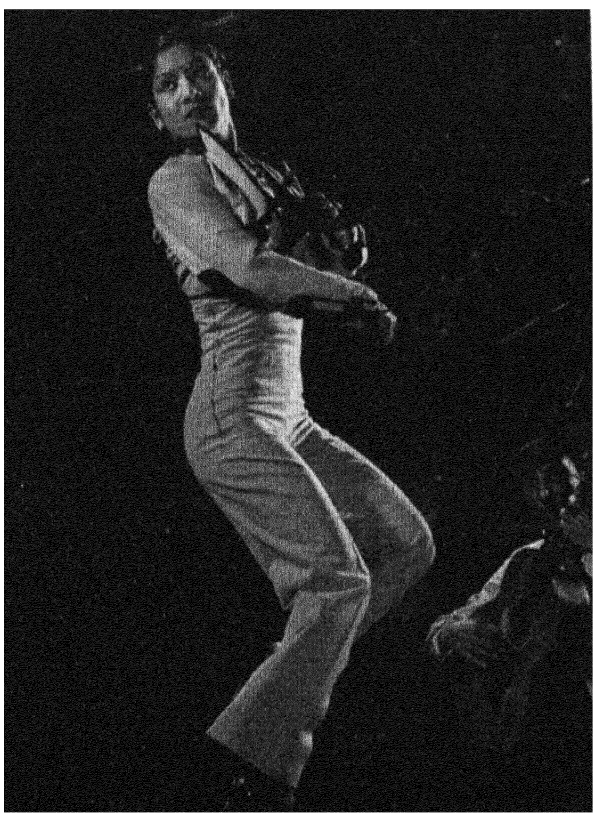


EROS VOLUSIA, exotic Brazilian dancer, was besieged with offers to tour the U.S.A. in 1941. She is shown doing a primitive witch dance

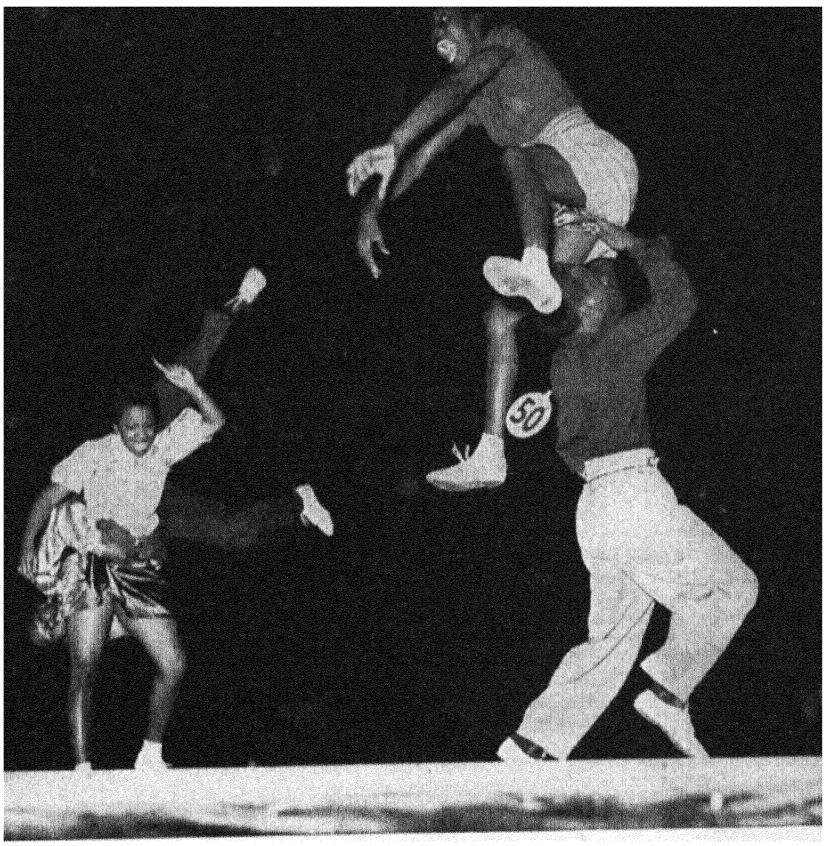


THE BALLET *Labyrinth*, with settings by the surrealist painter, Salvador Dali, had its première in New York city in the fall of 1941

CARMEN AMAYA, Spanish gypsy dancer, scored great triumphs in 1941 during her first U.S. tour



NEGRO CONTESTANTS performing the "boogie-woogie boost" in the annual Harvest Moon dancing contest in New York city Aug. 27, 1941. Some 20,000 spectators attended the finals



From a bird's-eye scanning of this wholesome social activity for the young, middle-aged and old, two important factors of influence stood forth: first, the infectious enthusiasm of individuals in the field of education, of national societies, or just "folk" indigenous to their countryside, whose influence spread through their writings, the radio or through the great festivals; second, the planned program and efforts of organizations and agencies of national scope. Among them were some government agencies, namely, the recreation divisions of the Work Projects administration, of the Federal Security and the Farm Security agencies; also, the Agricultural Extension service which, with the state agricultural colleges, works through the rural recreation specialists, 4-H club leaders and home demonstration agents. Outstanding among private organizations active in this field were the National Grange, the American Farm Bureau federation, the Co-operative League of America with its many affiliates, the Co-operative Recreation service, the international institutes, the National Recreation association, the American Association for Health, Physical Education and Recreation, the National Federation of Music clubs, the American Folk Dance society, the Country Dance society, the Methodist Youth and other denominational church youth organizations, the American youth hostels, the labour unions, the Campfire Girls and the Girl Scouts of America.

The year 1941 showed the increase in interest in many ways. More people than ever before gathered in city, country and college for regular weekly dances, more folk dancing was introduced into social dance events, more leaders were trained in special institutes or rose naturally from the ranks of the dancers, and there was a far greater demand upon the outstanding leaders to conduct institutes or give demonstrations with their groups. Because of the speeded-up demand there was, of course, some very poor dancing and leadership. Much of the grace and style innate in all true folk dancing was, in many instances, sacrificed to speed. An important trend was a growing awareness of Latin-American forms. Successful use was made of square and folk dancing in the recreational program of the armed forces of the United States.

Among festivals and institutes in 1941 might be listed: the Twenty-third Santa Fe fiesta, N.M. (first decreed in 1712, revived in 1939); the Twentieth Inter-Tribal Indian ceremonial, Gallup, N.M.; the Ninth International festival, Vancouver, B.C.; the Sixth Illinois Farm Sports (and Folk) festival, Urbana, Ill.; the Fifth Course in Square Dance Calling, Rural Youth conference, Storrs, Conn.; the Fourth Corn Huskin' Bee and All Campus Folk festival, Texas State College for Women, Denton, Tex.; the Fourth Little Rock Playgrounds' festival and numerous other county festivals throughout Arkansas and the First Arkansas State Folk and Patriotic festival, held in the portico of the state capitol; Third American Western Square Dance institute, University of California at Berkeley, Calif.; the Second Country Dance course at the Berkshire Music centre, Lenox, Mass.; the First Eastern Co-operative Recreation Training school, West Park, N.Y.; the Farmer's Week Square Dance festival, University of Ohio, Columbus, O.; the International festival, Oakland, Calif.; the French Canadian Handicraft festival (including square dancing), Quebec, Que.; the Portuguese Espiritu Santo festivals throughout central California, May through October; the Tulip festival, Holland, Mich.; the Basque Sheepherders' Christmas ball, Boise, Ida., drawing Basques from Idaho, Nevada, Utah and Oregon; the Invitation Dance and Athletic meet (Mormon), Brigham Young university, Provo, Utah; the Western Square Dance Nights during the Central City (three-week) Play festival, Colorado (historic, dating to the '70s); the Los Posadas and Los Pastores, ancient Spanish religious festivals, San Antonio, Tex., and elsewhere in the southwest at Christmastime; the Blessing of the Shrimp Fleet, an ancient French tradition, Mardi Gras, Rice, Sugar-Cane and Cotton festivals, all in Louisiana; the Square and String Dance festival at the 74-year-old Tunbridge, Vt., September fair; the Finnish Folk Dance Summer course, Kaleva Island, Eveleth, Minn.; the Ozark festivals and regular dance groups in Missouri and Arkansas; the May festivals and short courses in several Virginia colleges; the Eastern Co-operative League institute at Massachusetts State college, Amherst, Mass. Since the Texas Centennial in 1936 many annual festivals sprang up all over the state. During 1941 there were 14 harvest festivals, 21 pioneer festivals and ten flower festivals. The 1941 school roll call in the Detroit area showed 12,925 pupils receiving regular instruction in American quadrilles from leadership trained in Henry Ford's Greenfield Village, Dearborn, Mich., by Mr. and Mrs. Benjamin Lovett.

Some of the events held for the first time in 1941 follow: Berea College Summer School of Recreational Activities, Kentucky; Summer School in Early American Dancing, University of Michigan; Western Folklore conference, University of Denver; Short Course in American Dance and Song, Detroit, Mich.; International Folk Dance series, Los Angeles Public library; Pan-American festival, San Francisco, Calif.; Study Course "Folk Dances of Many Lands," Greenwich house, New York city; weekly dances and seasonal festivals (international), Community Folk Dance centre, New York city; Co-operative League workshops, training courses and play co-ops in many eastern and middle western cities and towns. (P. PA.)

Ballet, a popular theatrical dance attraction which played longer engagements to larger audiences than formerly, but necessarily confined its major operations to the western hemisphere, and by reversal of seasons as well as summer work, gave a practically continuous performance during 1941. There were many shifts of personnel among the several companies, which, including smaller ensembles, numbered in 1941 at least nine headquartered in the U.S.

The Ballet Russe de Monte Carlo, Leonide Massine, artistic director, gave outdoor performances at the Lewisohn stadium, N.Y., the Hollywood Bowl, Calif., and stopped in Hollywood long enough to make two Technicolor shorts for Warner Bros.—*Gaité Parisienne* and *Capriccio Espagnol*. The fall season opened early in October with a three weeks' engagement at the Metropolitan Opera house, when three novelties were presented: a second surrealist ballet, the Massine-Dali *Labyrinth*, Massine's *Saratoga*, and a restaging by Alexandra Fedorova of the third act of *Swan Lake*, called *The Magic Swan*, which was quickly dropped from the repertoire. The roster of principals and soloists was somewhat reduced, Toumanova, newly joining, and Krassovska, remaining, replacing Markova and Slavenska. At the conclusion of the New York engagement the company resumed its annual trans-continental tour under management of S. Hurok.

Colonel W. de Basil's Original Ballet Russe continued to meet with adventure and misadventure. After touring the United States well into the spring (following a prolonged New York engagement when premières were given works first produced in Australia and New Zealand the year before) they set forth for South America, with a stopover in Havana. There occurred what is probably the first strike in ballet history. It resulted in Hurok's breaking off relations with the company. The South American tour was cancelled, and most of the members were stranded in Cuba for the summer. In late August the reorganized company gave a series of outdoor performances at Washington's Watergate, thence to Canada (bookings by Fortune Gallo) with prospects of a U.S. tour to begin early in 1942. A notable acquisition was ballerina Nana Gollner.

As the Jooss ballet returned in June from a year in South America, Lincoln Kirstein's American ballet set out for a six months' good-will tour of the same territory, including Brazil, Uruguay, Argentina, Chile, Peru, Ecuador, Colombia and Venezuela in its itinerary. Panama, Puerto Rico, Cuba and Mexico were scheduled but finally excluded because of increasingly uncertain conditions caused by the spread of war. The membership combined dancers from Kirstein's American Ballet Caravan, the former American ballet and other companies, headed by Lew Christensen, Marie-Jeanne, Gisella Caccialanza and William Dollar. Among new works presented were Balanchine's *Ballet Imperial;* Christensen's *Pastorela*, on a Mexican theme, in which he was assisted by José Martinez and José Fernandez; Tudor's *Time Table;* and Dollar's *Juke Box*. New works on South American themes, done with the collaboration of native painters and musicians, were created en route.

The Jooss ballet opened at the Maxine Elliott theatre, New York, in September, giving New York premières to *Chronica* and *A Spring Tale* and the revised *Prodigal Son*, all by Kurt Jooss, during a five weeks' engagement there. For the first time in its history a choreographer other than Jooss was called upon when the American, Agnes de Mille, did *Drums Sound in Hackensack* (which had its world première during the New York season) for them. The company played two additional weeks at the Windsor theatre and was scheduled to play Schubert theatres throughout the United States. Thirteen nationalities were said to be represented in this onetime German company. While in South America, several of the men left to join the British military forces. Rudolf Pescht and Ernst Uthoff took posts in the Chilean government's ballet school in Santiago, Chile. Lucas Hovinga, Alfredo Cordino, Richard Wyatt, Marguerite d'Anguerra and Lavinia Niehaus were new additions to the cast. Jooss and Leeder in England removed their school from South Devon to Cambridge and were awaiting transportation to the United States.

Ballet Theatre played a short New York winter season and was then comparatively inactive until summer, when a goodly portion of the cast took part in the International Dance Festival and School conducted by Dolin and Markova at Jacob's Pillow, Ted Shawn's estate in the Berkshires in Massachusetts. There, Baronova, who had been appearing on and off with both Russian companies, joined them, and her husband, Gerald Sevastianoff, became general manager. The company, reorganized under Hurok, opened its third season in Mexico City in October and in November under the combined sponsorship of Hurok and the New Opera company, played the first two weeks of its engagement at the Forty-Fourth Street theatre, New York, continuing thereafter until the middle of December under Hurok management alone, their first transcontinental tour scheduled to begin early in Jan. 1942. New works presented were Fokine's *Bluebeard*, Vania Psota's *Slavonika*, Dolin's rearrangement of parts of *The Sleeping Princess* and Nijinska's revival for the first American performance of her *La Bien Aimée* (*Beloved*). Nijinska also restaged *La Fille Mal Gardée*, which in the general Anglicization of titles became *The Wayward Daughter*. Several soloists from the two Russian companies joined these ranks—Jeannette Lauret, Rosella Hightower, Ian Gibson, George Skibine and Yura Lazovsky among them.

Laurent Novikoff was appointed ballet master for the Metropolitan Opera, Boris Romanoff, the former ballet master, planning to form his own company, according to announcements. Igor Schwezoff, who came to the United States with the de Basil company and later took his own studio in New York, was ballet master for the New Opera company's New York season.

The Littlefield ballet, Catherine Littlefield, director, was official ballet for the Chicago Opera season, with a tour running into 1942 following. The San Francisco Opera ballet, under William Christensen, extended its annual tour as far east as Cleveland. The Graff ballet, headed by Grace and Kurt Graff, spent the summer at headquarters, Fieldstone, Newfane, Vt., giving programs in their own Playbox and in near-by towns, and preparing for the fall tour which opened in October. Ruth Page and Bentley Stone with an augmented company made a second tour of South and Central America during the summer months, and in December appeared at Radio City's Rainbow Room.

Eugene Loring, formerly of Ballet Theatre, the American ballet and Ballet Caravan, and later star of Saroyan's *The Beautiful People*, organized and put into rehearsal a new company of 16 dancers to be called Dance Players, Inc., for the purpose of presenting original works on American themes by collaborating American artists. Lew Christensen of the American ballet and Janet Reed of the San Francisco Opera ballet, joining him. The New York debut and a preliminary tour were planned for the spring of 1942.

Dance Index, a noncommercial monthly to be devoted to discussions of dance and dancers by leading writers, first publication scheduled for Jan. 1942, was founded by Kirstein. The *American Dancer*, the oldest dance magazine in the U.S., and *Dance*, the newest (up to *Dance Index*), improved and prospered along with the increased public interest in all forms of dance.

Dance Archives staged a Pavlova and a Duncan memorial exhibit among others. Kirstein conducted a scholarship contest at his School of American Ballet. Glenway Westcott received the book award for his *The Dream of Audubon*, David Diamond the musical award, in Ballet Guild's competi-

tion for a new American ballet, the award in décor was held up by union rules. Lillian Moore of the Metropolitan Opera ballet, took a company of 12 dancers for festival performances at San Juan, P.R., in October. Margarete Wallman continued at the Colon, Buenos Aires, Arg.

A short film of the Leningrad ballet, starring Tschabukiani, was shown in the United States. Zorina in *Louisiana Purchase* was transferred from stage to screen. Ballet continued among models for Disney cartoons, including the new *Dumbo. It Happens on Ice*, in second edition, *Icecapades* and *Ice Follies* kept ballet among other forms actively on ice. Irving Deakin continued radio talks begun early in 1937. Petroff and Gollner of the Original Ballet Russe made a television broadcast, and late in 1941 Platoff, Rostova and Delarova left Russian ballet for the new musical show, *The Lady Comes Across*.

In England the diversion of blitz to the Russian front helped ease the situation. But two fine dancers, Harold Turner and Frederick Ashton, joined the R.A.F. Arnold Haskell, the original balletomaniac, patrolled "one of the loveliest roads in England." The Vic-Wells ballet played at the New theatre, produced Ashton's *The Wanderer*, Ninette de Valois's *Orpheus and Eurydice* and toured the provinces; the Ballet Guild produced Keith Lester's *The Dark Mirror;* the Rambert-London ballet Frank Staff's *Czerny 2*, among many activities centred in London but radiating through the provinces, which included the founding of a new International Ballet company and of the Anglo-Polish ballet. The *Dancing Times* continued to publish regularly in spite of paper and labour shortage.

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Concert dance in the United States during 1941 existed more by the will to live than by any great financial success or backing. Although the best dancers drew their own audiences in large numbers, the single or paired recital was less remunerative than the weekly theatre engagement; and society favoured the more sumptuous ballet for sponsorship. Only a few solo or duo dancers were able to make the journey to South America.

In fact, in the early part of the year business looked fairly dull for the leading moderns in the United States. All continued to teach to eke out a living, sometimes giving master courses or lecture-demonstrations on tour.

Martha Graham, with her company, gave the usual New York concerts, revising to brilliant success her *Letter to the World*, first produced at the Bennington festival the summer before, but did not widely tour. In the spring she contracted with the new WGN Concerts management for a nation-wide tour to begin in the fall. It was at the Bennington festival that she came into her own, for there she produced her new dance comedy, *Punch and The Judy*, which with *Letter to the World* and *El Penitente* carried off all honours.

Doris Humphrey and Charles Weidman, with their company, maintained the repertory season well into the spring at their new studio-theatre in New York, offering among new works Miss Humphrey's *Song of the West* and a revival of *The Shakers* as well as several humorous pieces by Weidman. Miss Humphrey as chief choreographer for the Bennington festival of 1941 there produced her full-length suite, *Decade*, an autobiography of the Humphrey-Weidman career, quoting from the repertoire of a decade or more. After a brief fall tour, the new repertory season opened during the Christmas holidays, when *Decade* and Weidman's *Flickers* were scheduled for first New York performances.

Hanya Holm and her company presented in New York *The Golden Fleece, an Alchemistic Fantasy*, with theme and costumes by the surrealist painter, Kurt Seligmann, and spent the summer (on leave of absence from the Bennington festival) teaching and producing at Colorado college, reopening her New York studio in the fall.

Helen Tamiris conducted a repertory season at her New York studio, producing new works. Anna Sokolow, returned from two years in Mexico City, gave New York performances and toured. Argentinita and her Spanish Ensemble made fewer appearances, but Spanish dance was active in studio and night club performances.

There was much activity throughout the United States with a filtering into Canada and South America. Miriam Winslow and Foster Fitz-Simons made the most extensive tour of the latter terrain, returning after several months to become the first concert dancers to appear in New York's Rainbow Room, and beginning a new United States tour in December. Paul Draper, who had tapped successfully to classical music in a touring theatre-concert program with his aunt, Ruth Draper, played an engagement in Rio de Janeiro, Braz. Jack Cole appeared with his dancers in New York night clubs and later in Rio. The single prominent importation from South America, the flamenco dancer, Carmen Amaya, made her North American debut in the New York night club, The Beachcomber, and after a long run toured motion picture theatres as a unit in stage shows, appearing also in a short film.

While the concert dance in its highest estate may be said to have arrived at the theatre in its best sense, the direction of the younger concert dancers during 1941 was into popular forms of theatrical entertainment—night club, revue, musical comedy, motion picture, radio and television—whether from desire for variety or the stark necessity of earning a living wage. A splendid array of young moderns danced in the stage hit, *Lady in the Dark*. Katherine Dunham, of *Le Jazz "Hot,"* the concert program and the stage show, *Cabin in the Sky*, made, with her company of Negro dancers, a short subject in Technicolor, *Carnival of Rhythm*, for Warner Bros. Angna Enters, dance-mime, contracted with RKO for her debut screen role in *Passage from Bordeaux*, and with MGM to direct from her own script, *Mama's Angel*. Winslow and Fitz-Simons made a television broadcast, as did Corinne Chochem, the latter in dances on Hebraic themes. Humphrey and others gave radio talks on modern dance.

On the Pacific coast, Lester Horton and his dancers continued as the leading modern group; Mills college conducted its annual summer dance session; José Limon (a former Humphrey-Weidman dancer), drafted and deferred, gave duo performances with May O'Donnell (a former Martha Graham dancer); Devi Dja and her Bali-Java dancers supposedly brought their "farewell tour," from the east, through the southern states, to a close; Carmalita Maracci, returned from her midwinter eastern tour, taught and prepared new programs for the December concert season in New York.

Meanwhile, important events in the concert field took place before war came to the United States. In the summer Ruth St. Denis revived her debut program of 1906 for the International Dance festival at Jacob's Pillow, and later, with other famous dances from her repertoire added, in a New York concert series in 1941. Withdrawing from the School of Natya, she took a studio formerly occupied by Isadora Duncan, there to conduct a salon of dance. La Meri removed the School of Natya to Riverside drive, holding monthly lecture-demonstrations on oriental dance forms, and giving a concert of Indian Natya at the Guild theatre in December. Ted Shawn, who taught and performed at the International Dance Festival and School, was appointed director of a new project, the Jacob's Pillow Festival and School, by a committee assembled to carry out plans for enlargement of the plant, and the maintenance of a summer school and festival to incorporate all kinds of dance. Shawn contracted to teach and perform for at least five years.

Distinguished solo debuts were made in New York by Barton Mumaw, of the disbanded Shawn dancers, by Emy St. Just, trained at the Jooss-Leeder school in England, and by Sybil Shearer, formerly of the Humphrey-Weidman company. Mumaw began a nation-wide tour as soloist in October.

Concert dance in the United States took on new life in the fall of the year, with many new plans and projects, although the Selective Service act threatened to make inroads in the supply of younger men dancers. Franziska Boas, New York modern dancer and creative percussionist, organized a seminar of lectures on "The Function of Dance in Human Society." The Wadsworth Atheneum of Hartford, Conn., announced a series of lectures and performances by noted dancers and dance-musicians. *Dance Observer*, a monthly magazine originally devoted to modern dance but including other contemporary forms, established a service bureau for presenting dancers and discussing their problems in a regular column of questions and answers.

In England there was little opportunity for visiting concert dancers, and modern dance has never got much of a foothold there. But a window looking out on the American field was kept open in the "New York Letter" of the *Dancing Times*, and in special articles, photographs and discussions of the great American modern dancers—Martha Graham, Doris Humphrey and Weidman. Wigman and Kreutzberg were still dancing in Germany, at least during the earlier part of the year.

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Danube, Control of.

On March 1, 1939, Germany was given a seat on the International Danubian commission, while Rumania was accorded full sovereignty over the lower reaches of the river. On Sept. 17, 1940, Germany abolished the commission and replaced it with a "consultative committee" on Danubian affairs, under a permanent German director, Dr. George Martius. This committee was composed of delegates from Italy, Hungary, Bulgaria, Yugoslavia and Slovakia. In July 1941, two months after the fall of Belgrade, a new German Danube Navigation company assumed complete control of all navigation on the river, and thus abolished the last vestiges of the international regime established in 1856. (S. B. F.)

Darlan, Jean Louis Xavier Francois

(1881–), French naval officer and statesman, was born Aug. 7 at Nérac, France. He entered the navy in 1899 and during World War I commanded a battery of naval guns on the western front and participated in operations on the Balkan front. In July 1918 he returned to the sea as captain of a warship. After the war, he advanced through the grades to vice admiral and was commander in chief of French naval forces, 1939–40. With the fall of France in June 1940, Darlan was named navy minister in the Pétain government. An ambitious politician, he rose swiftly in the Vichy cabinet, superseding Pierre Laval (*q.v.*) and Pierre Etienne Flandin in the favour of Marshal Pétain.

On Feb. 9, 1941, Darlan became vice-premier and took over the foreign ministry and interior portfolios; he also became heir apparent to Pétain's mantle as chief of state. Shortly thereafter he dismissed army, navy and government officials who did not support his pro-axis policies. He frequently negotiated with nazi authorities concerning the terms of German occupation, and on many another occasion he gave evidence of his willingness to collaborate with Germany in the European "new order." (*See* also FRANCE.)

Dartmouth College. An institution of higher learning at Hanover, New Hampshire. The total student enrolment in 1941 was 2,426, only five less than in the preceding year. The number of faculty and administrative officers was 327. When the U.S. declared war against the axis powers in Dec. 1941, the college took immediate steps to speed up its program to permit students to finish their work for the bachelor's degree before entering military service by (1) allowing seniors to take a special comprehensive examination if ordered to report for duty; (2) giving special examinations to seniors and underclassmen called to service to complete their first semester work; (3) eliminating the winter carnival, house parties and the Easter vacation, and advancing commencement day from June 14 to May 10; (4) planning a summer session (Dartmouth previously had not had a summer school) to permit greatly accelerated progress toward the degree.

The 25th anniversary of President Ernest M. Hopkins' administration was celebrated in 1941. The annual Dartmouth alumni fund campaign, devoted to recognizing the anniversary, raised $196,000. (S. C. Ha.)

Daugherty, Harry Micajah (1860–1941), U.S. lawyer and politician, was born Jan. 26 in the town of Washington Court House, O. He graduated from the University of Michigan and began the practice of law in Columbus, O. In 1921 he was appointed attorney general by President Harding. His tenure in office was stormy; he was named in the Teapot Dome scandal, and a senate investigating committee declared he had dealt in Sinclair oil after he had entered the cabinet. He was exonerated by the house judiciary committee of a 14-point charge demanding impeachment. He was twice prosecuted for alleged conspiracy to defraud the government in obtaining allowance of a claim of $7,000,000 against the alien property custodian; the jury disagreed in each case. He resigned in March 1924. After his retirement, he wrote a book defending himself and the Harding regime against charges of corruption. He died Oct. 12 in Columbus, O.

Daughters of the American Revolution. The national society, Daughters of the American Revolution, organized Oct. 11, 1890, makes eligibility for membership dependent upon direct descent from a patriot who aided in securing American independence. Membership Dec. 1, 1941, approximated 143,000 in 2,554 chapters in every state and in many countries. President general, Mrs. William H. Pouch; headquarters, Memorial Continental hall, Washington, D.C.

Activities of 1941 included gifts of $100,000 for 14 approved schools for foreign born and southern mountaineers. Improvements for the schools consisted of a new high school building at Tamassee, additions to high school building at Kate Duncan Smith and improvements to model farm. Two of these schools, Tamassee in South Carolina and Kate Duncan Smith on Gunter mountain in Alabama, with approximately 700 pupils, were completely owned and operated by the D.A.R.

Other activity for the year included instruction in the use of leisure and respect for rights of others to 255,584 children in Junior American Citizens clubs; distribution of about 300,000 manuals for citizenship, in 16 languages, to aid in naturalization; 5,000,000 tiny Penny Pine trees were planted in all states of the Union, in co-operation with the U.S. forest service with memorial forests in 40 states. Loans made to students through the D.A.R. student loan fund totalled 5,362. Three social workers were maintained in the detention rooms at Ellis island and for occupational therapy among men of the coast guard and merchant marine confined in the Marine hospital. A high school senior from every state, winner of the Good Citizenship contest, was given a trip to Washington. Motion pictures were previewed and informative lists circularized. About 58,000 copies of the *National Defense News*, designed to promote confidence in fundamentals of the American form of government, were distributed. Distribution of Flag Codes and other patriotic literature reached into hundreds of thousands. The society publishes the *National Historical Magazine*. Through some 1,400 clubs, the society furthered its educational endeavours through training in girl Homemaking. By use of a national catalogue, papers of historical import were loaned to the some 2,500 chapters. A genealogical library of 32,000 volumes and an early American museum are open in the society's headquarters, Memorial Continental hall, Washington, D.C. (H. R. P.)

Davenport, Eugene (1856–1941), U.S. agriculturist, was born June 20, in Woodland, Mich. The son of a Michigan farmer, he worked his way through the Michigan Agricultural college. In 1891–92 he was president of the Collegio Agronomica in São Paulo, Brazil. In 1895 he became dean of the college of agriculture of the University of Illinois and launched experimental farm stations at Urbana and in other parts of the state. He organized farm associations, developed crop rotation and wrote several books and articles on breeding and statistical evolution. He retired in 1922. Dr. Davenport died in Woodland, Mich., March 31.

Davies, Sir Henry Walford (1869–1941), British organist and composer, was born Sept. 6 at Oswestry, Shropshire, England. Famous for his leadership in musical education in England, he was appointed master of the king's music in 1934. For the jubilee of King George V and Queen Mary, he arranged the program for the command performance at Albert hall, London, and set to music John Masefield's *A Prayer for the King's Majesty*. When George V died, Davies wrote a musical tribute which was performed by the London Philharmonic orchestra at the Royal Choral society's memorial service. He was co-editor of the "service book" of music played at the coronation of King George VI and Queen Elizabeth in May 1937. He died at his home near Bristol, March 11. (See *Encyclopædia Britannica.*)

Davis, William Rhodes (1889–1941), U.S. oil operator, was born Feb. 10 in Montgomery, Ala. He attended Stark college but left before graduation to work as a candy butcher on a railroad. In 1913 he organized an oil company in Oklahoma. After World War I, during which he served in the A.E.F., he returned to the Tulsa boomfields and rose from a small-scale wildcatter to the position of an influential oil "czar." By 1938 his holdings included fields in Texas, an oil refinery in Hamburg, Germany, and oil storage facilities in the Scandinavian and Baltic states. He was the go-between, in 1938, in the barter deals between Mexico and the axis powers, whereby the latter secured huge oil reserves prior to the outbreak of war in 1939. In the fall of 1939 he submitted peace proposals, assertedly drafted by Marshal Goering, to the U.S. state department. The proposals were widely publicized by Verne Marshall, head of an isolationist group. Davis died in Houston, Texas, on Aug. 1.

DCB: *see* Defense Communications Board.

Deafness. **Hearing Aids.**—Individuals who have difficulty in hearing conversation at a distance of six feet

or less in relatively quiet places as in the office or home may be helped by wearing a hearing aid. Clinical examinations of a hard-of-hearing person should include audiometric tests and will usually indicate to the otologist whether the patient will be benefited enough by an aid to warrant the expense of a purchase.

Two types of electrical hearing aids were on the market in 1941: (1) the telephone or carbon granule microphone hearing aid and (2) the vacuum tube hearing aid employing a crystal microphone.

The trend seemed to be away from the telephone or carbon granule type of hearing aid. The vacuum tube hearing aid usually weighs approximately 10 oz. complete and consists of a small crystal microphone and a miniature vacuum tube amplifier built in a wearable case (2 oz.), A and B batteries (7 oz.), a receiver (1 oz.) and wire connections. The receiver may be of two types: air conduction, a small button which fits closely in the better ear; or bone conduction, a receiver which rests on the mastoid and is held in place by a spring headband. An otologist's examination generally determines which type of receiver will give the most satisfaction to the patient.

The cost of operating the aids depends largely on the number of hours the aid is in use—roughly speaking, it costs $2.00 per month for battery upkeep.

Although there are methods and instruments designed to help the fitter select an aid for the hard-of-hearing person, these procedures have not been perfected and the most satisfactory method in 1941 was to try the aid on the hard-of-hearing person.

A list of accepted hearing aids may be obtained from the Council on Physical Therapy of the American Medical association. A list of requirements on which the acceptance of these hearing aids is based also may be obtained from the council's office on request.

(H. A. C.)

Death Ray: *see* GRINDELL-MATTHEWS, HARRY.

Deaths (of prominent persons in 1941): *see* OBITUARIES.

Death Statistics.

Final reports show that there were 1,417,269 deaths in the United States during 1940, and that the corresponding death rate was 10·8 per 1,000 of total population. This figure is somewhat higher than that for 1939, which was the lowest yet recorded in that country, namely, 10·6 per 1,000. Provisional data relating to 42 states and based on records for the first six months of 1940 and 1941 indicated a 3% improvement in mortality in 1941 over 1940. Canada recorded 110,648 deaths in 1940, with a death rate of 9·7 per 1,000 population. This established a slight rise over the death rate for 1939, and the indications were that there might have been a further increase in 1941. This conclusion is based upon a 3% increase in deaths in 67 cities and towns in Canada during the first half of 1941 as compared with the same period in 1940. During 1940, England and Wales experienced 572,882 deaths and had a death rate of 14·3 per 1,000 total population. This death rate is the highest reported for England and Wales for any year since the influenza pandemic of 1918, when the rate stood at 17·3 per 1,000 population. The figure for 1940 is 18% higher than that for 1939 and 23% above that for 1938, the last prewar year. However, it is quite likely that the record for 1941 will be better than that for 1940, for data relating to the great towns and extending from January through August of each year show a 4% decrease in deaths.

Death rates for the principal English-speaking countries since 1921 will be found in the accompanying table. During almost all of this period, the best showing was made by New Zealand, followed closely by Australia and the Union of South Africa.

Mortality statistics among the belligerent countries may never be recorded accurately, but it is quite evident that since the war began in Sept. 1939, there has been a general rise in death rates as the result of abnormal conditions. This is clear from the record just cited for England and Wales. During 1940, the civilian population alone of England and Wales suffered 23,081 deaths as a result of aerial bombardments; this accounted for 4% of the total deaths for the year. In addition to these casualties, there were 19,151 such deaths from January through August of 1941. In contrast, only 1,117 civilians were killed in aerial attacks on Great Britain during all of World War I. The greatest number of fatalities resulting indirectly from air raids arose from highway accidents during blackouts. There were 11,424 such deaths in the first 15 months of the war, or 3,141 more than in the preceding 15 months of peacetime.

Annual Death Rates per 1,000 Total Population in the Principal English-speaking Countries, from 1921 to 1940

Year	United States	Canada	England and Wales	Scotland	Northern Ireland	Eire	Australia	New Zealand*	Union of South Africa (whites)
1921	11.6	11.6	12.1	13.6	15.3	14.4	9.0	8.7	10.4
1922	11.7	11.5	12.7	14.9	15.6	14.7	9.2	8.8	9.5
1923	12.2	11.7	11.6	12.9	14.9	14.0	9.9	9.0	9.8
1924	11.7	10.8	12.2	14.5	16.1	15.0	9.5	8.3	9.6
1925	11.8	10.0	12.1	13.5	15.7	14.6	9.2	8.3	9.4
1926	12.3	11.4	11.6	13.1	15.0	14.1	9.4	8.7	9.6
1927	11.4	10.9	12.3	13.6	14.6	14.8	9.4	8.4	9.7
1928	12.1	11.1	11.7	13.5	14.4	14.2	9.4	8.5	10.2
1929	11.9	11.3	13.4	14.7	16.0	14.6	9.5	8.8	9.5
1930	11.3	10.7	11.4	13.3	13.9	14.2	8.6	8.6	9.7
1931	11.1	10.1	12.3	13.3	14.5	14.6	8.7	8.3	9.4
1932	10.9	9.9	12.0	13.5	14.2	14.6	8.6	8.0	10.0
1933	10.7	9.6	12.3	13.2	14.4	13.7	8.9	8.0	9.3
1934	11.1	9.4	11.8	12.9	13.9	13.2	9.3	8.5	9.7
1935	10.9	9.7	11.7	13.2	14.6	14.0	9.5	8.2	10.5
1936	11.6	9.7	12.1	13.4	14.4	14.4	9.4	8.7	9.6
1937	11.3	10.2	12.4	13.9	15.1	15.3	9.4	9.1	10.1
1938	10.6	9.5	11.6	12.6	13.7	13.6	9.6	9.7	9.5
1939	10.6	9.6	12.1	12.9	13.6	14.2	9.9	9.2	9.4
1940	10.8	9.7	14.3	14.9	14.6	14.2	9.7	9.2	....

*Europeans excluding Maoris.

The war also had an effect on certain morbid conditions. Thus, deaths from cerebrospinal fever in London rose from 31 in the first 50 weeks of 1939 to 156 in the corresponding period of 1940; the increase is attributed to overcrowded conditions in air-raid shelters. In London in the same period, an increase of about one-third in mortality resulting from ulcers of the stomach and duodenum is ascribed partly to nervous strain experienced by the people subject to air raids. On the other side of the picture, maternal mortality in England and Wales in 1940 was 2·6 per 1,000 live births, the lowest on record for the country.

Mortality from tuberculosis always tends to increase under wartime conditions. In England and Wales, mortality from this disease increased by 13% from 1939 to 1940 among men and by 7% among women. Scotland reported an increase of 14%, reaching the highest rate recorded since 1932. There was also a significant rise in mortality from tuberculosis in Canada during the first half of 1941. These rises are attributed to lowered resistance to the disease among the population and to an increase in contacts between tubercular and nontuberculous persons. Loss of resistance results from malnutrition, unusually long working hours, and the strain of factory labour, particularly upon young women who have never been engaged in such work before. Contacts between victims of the disease and healthy members of the community increase because of overcrowding as a result of homes having been destroyed by bombs, because of a shortage of housing for workers transplanted to areas where new war industries are set up, and because of a shortage of hospitals and hospital facilities which have been assigned to the military forces.

Within the United States, the highest death rates in 1940 were found principally among the states of the east, while the lowest rates were generally in the central and western areas. Thus,

Vermont had a death rate of 12.8 per 1,000 population; New Hampshire, 12.7; Maine, 12.5; Delaware, 12.2; and Maryland and Florida, each with 12.1. Nevada also had a high death rate, namely 12.7 per 1,000. North Dakota made the best showing with a death rate of 8.2 per 1,000 population, followed by South Dakota, with 8.5; Wyoming, 8.5; Arkansas, 8.7; Oklahoma, 8.8; and Utah, 8.9. New York state had a death rate of 11.1 per 1,000. Since the foregoing figures are crude death rates, based only upon total deaths and total population, they are affected by differences in the age, sex and racial constitution between the populations of the states.

Provisional mortality statistics compiled for 41 states in 1940 show that diseases of the heart resulted in 289 deaths per 100,000 of population and that the death rate from cancer was 118 per 100,000. Death rates per 100,000 population from other important causes were as follows: cerebral haemorrhage, embolism and thrombosis, 90; nephritis, 76; total accidents, 70, of which automobile accidents accounted for 24; pneumonia, 54; tuberculosis, 44; diabetes mellitus, 26; and influenza, 15 per 100,000.

An insight into the mortality situation for the first nine months of 1941 may be obtained from the experience of the millions of industrial policy-holders of the Metropolitan Life Insurance company. According to this experience, new low records for 1941 would be established for pneumonia, tuberculosis, appendicitis and suicides. The improvement in mortality from pneumonia is especially noteworthy, the 1941 death rate being only one-half that of the like period in 1937; the reduction is attributed to the new treatment of the disease by chemotherapy. Improvements in mortality for the first nine months of 1941 compared with the same period in 1940 were also noted for scarlet fever, diphtheria, diabetes, diseases of the puerperal state, the cardiovascular-renal diseases and homicide. There was a sharp increase in mortality from measles and a slight increase in whooping cough. Influenza and cancer also showed increases. A sizeable increase in the accident death rate is attributed largely to the expansion of industrial activity in connection with the national defense program, with a consequent rise in industrial accidents. (*See* also ACCIDENTS; CENSUS, 1940; INFANT MORTALITY and SUICIDE STATISTICS.)

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Debts, Government: *see* NATIONAL DEBTS.

Debts, National: *see* NATIONAL DEBTS.

Defense, National (U.S.).

The year 1941 opened on the keynote of the closing months of 1940. U.S. public opinion differed on nearly every item of public concern. Interventionists and noninterventionists alike beat their drums from the public rostrum and over the far-flung waves of the radio. The "Land of the Free" was living up to its name. But the year 1941 closed on a note of national solidarity which the most optimistic would scarcely have predicted. Dissenting opinions and pet isms were cast into utter discard in the face of the emergency which arose when Imperial Japan attacked the great base at Pearl Harbor, Hawaii, on Dec. 7, 1941. The following day, in answer to President Roosevelt's message, personally delivered before a joint session of both houses, the congress declared that a state of war existed between Japan and the United States. On Dec. 11, similar action was taken in naming Germany and Italy as formal enemies of the U.S. The die was cast, and the nation stood united with but one ultimate commitment, the complete and final destruction of a world tyranny which stood manifest in the aims of Hitler, Mussolini and the Japanese war-party government.

The days and weeks preceding Dec. 7, 1941, had witnessed much progress toward the aim of improved national defense. Plans for a bigger and better army were bearing fruit; navy policies and navy construction were advancing toward the goal of an adequate two-ocean navy; civilian effort was being guided into productive channels to meet the demands of the rapidly changing picture; obsolete governmental theories and practices were crumbling and disappearing as they menaced progress. The nation, in spite of much hindering soapbox oratory within and without congressional halls, was advancing sensibly toward a better measure of national defense.

Repeal of the Neutrality Act.—Early in July 1941, U.S. forces landed in Reykjavik, Iceland. Previously, British forces had been withdrawn from this area in considerable numbers. To leave the area unoccupied would have been to invite German seizure and subsequent destruction of U.S. shipping carrying aid to Britain over the north Atlantic sea lanes. At the time of U.S. occupation, the president announced that substantial forces had already been sent to bases in Trinidad and British Guiana in order ". . . to insure the safety of communications in the approaches between Iceland and the United States *and all other* strategic outposts." The italics are especially pertinent when the occupation of Dutch Guiana later in the year is recalled. In the latter incident, protection of enormous bauxite deposits, basis of aluminum, was the motivating factor.

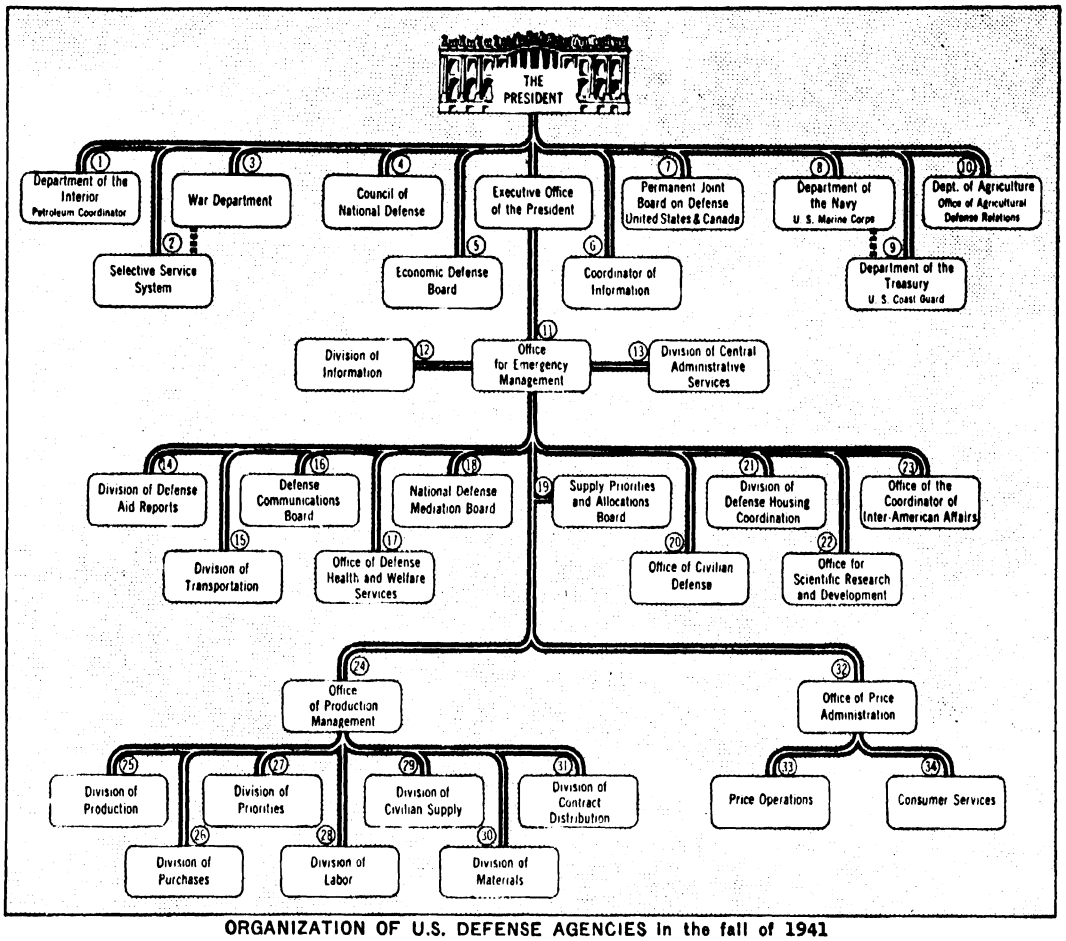
Prior to the occupation of Iceland, the S.S. "Robin Moor," a U.S.-owned vessel under Panaman registry, had been sunk May 21, 1941, by a nazi submarine. The United States seized all axis assets and closed 25 German consulates. Successively the "Sessa" (Aug. 17), the "Steel Seafarer" (Sept. 7) and the "Montana" (Sept. 11) became nazi targets. Carrying the U.S. flag, the "Greer" was next attacked, and in October the U.S. suffered its first casualties when the destroyer "Kearny" was fired upon and hit. After the "Greer" incident, orders went out to the navy to shoot axis raiders on sight if they were operating in American defensive waters.

The prospect of continuing a neutrality act in operation began to look dark indeed. Merchant ships, under the existing act, could not be armed, neither could they enter previously declared war zones. Yet, going about their business, they became enemy targets and were liable to being sunk. In 1917, Pres. Wilson admitted the failure of the nation's then-existing neutrality policy. Its conception was founded on two assumptions: (1) that by formal legislation before hostilities others could be discouraged from making war, and (2) that should war come, the U.S. could shelter itself behind a barrier of neutrality by legislation. The year 1941 found the U.S. ultimately in no better fix than in 1917 with respect to this policy.

After much oratory, the Neutrality act, conceived in 1935, rewritten in 1937 and 1939, went into the discard in 1941, the house voting 212–194 in November to eliminate restrictions imposed by it on cargo vessels. (*See* also NEUTRALITY.)

Other items of legislation of importance in the defense picture in 1941 included: (1) the amendment of the Selective Service act, (2) the passage of the Lend-Lease act, and (3) the enactment of a new male Registration act. In the first instance, service of conscripts was lengthened from 12 to 30 months; the ban on service outside the continental limits of the United States was later raised. Original aid to Britain had taken the form of an exchange of destroyers for military bases. By passage of the Lend-Lease act, March 11, 1941, the president was authorized to manufacture in

U.S. shipyards and factories those weapons, munitions, aircraft and vessels of all kinds required to be of definite help to European democracies contending against Germany. Title of goods involved could be transferred to those nations whose battle lines were defending U.S. production lines. As soon as passed, this act was implemented by a $7,000,000,000 appropriation. Later in the year, more money was provided as needed. New registration legislation included listing of all males from 19 to 64 and requiring, if necessary, military service from those aged 20 to 44. (*See* SELECTIVE SERVICE.)



ORGANIZATION OF U.S. DEFENSE AGENCIES in the fall of 1941

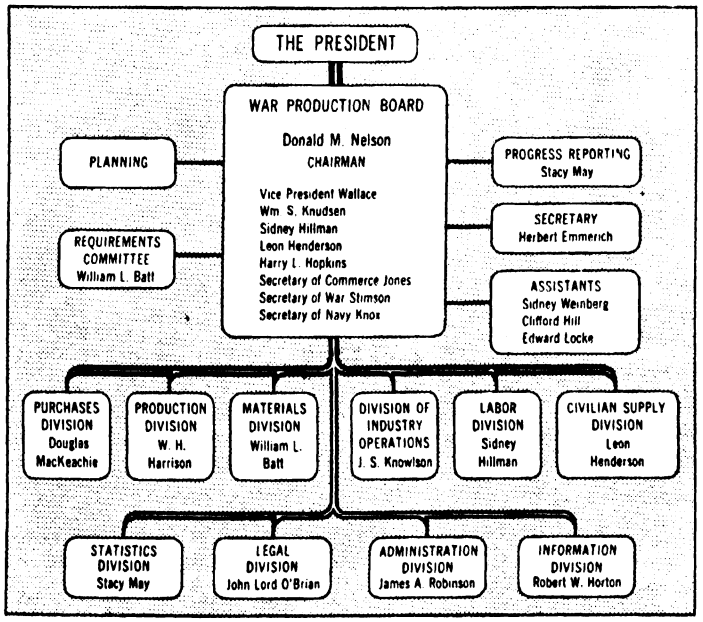
Armed Forces.—*Army.*—The purely military problem of national defense in 1941 was concisely stated by Secretary of War Stimson (*q.v.*) when he appeared before the Truman committee of the United States senate in April. He said that it was necessary to: (1) create large forces trained to operate in a war of movement; (2) train those forces for a new kind of mechanized warfare; and (3) build everything the U.S. forces needed, since, unlike 1917–18, no other nation stood ready to sell these things. The record of the year shows that considerable progress was made toward these objectives.

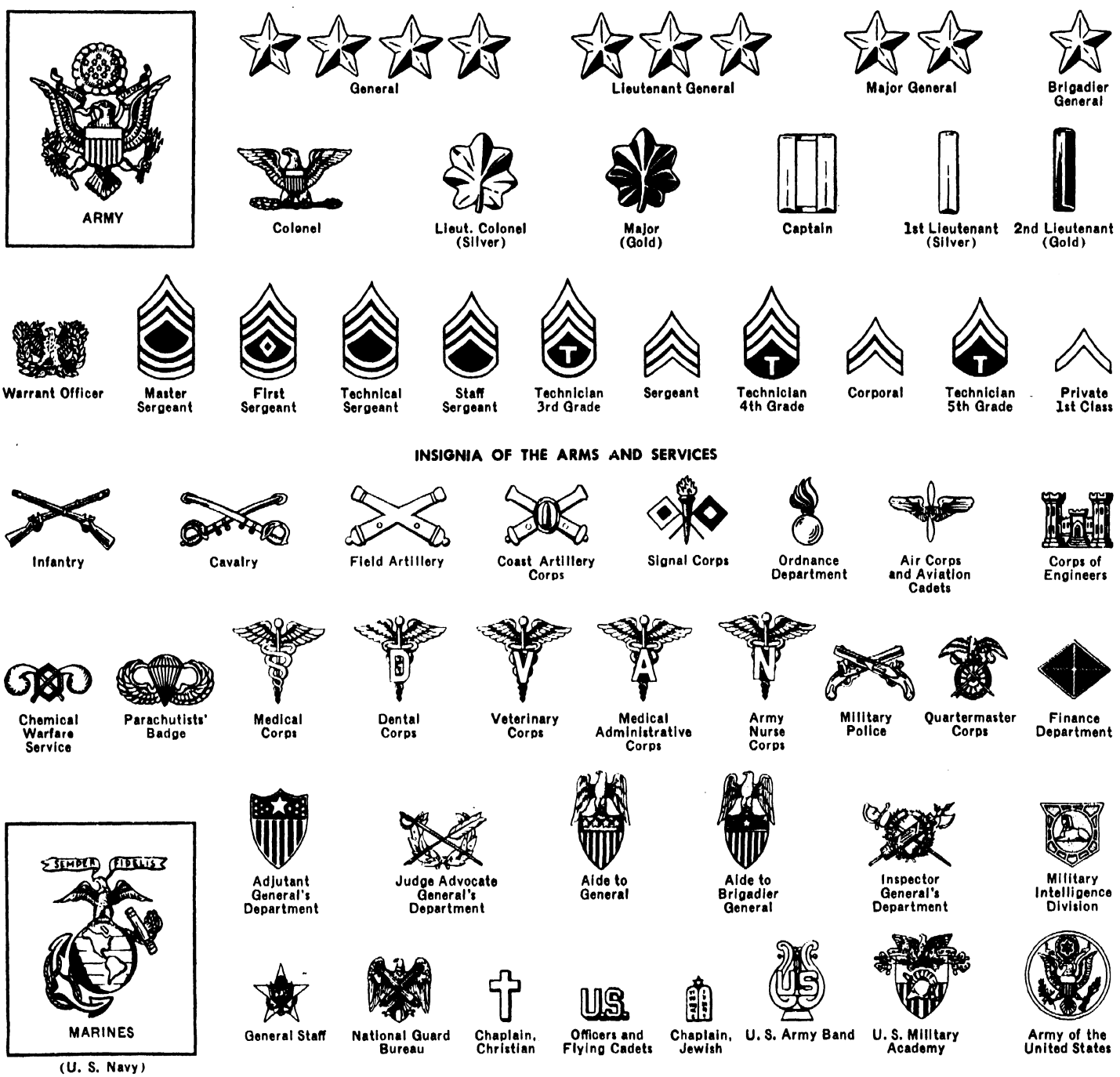
When the year ended, there were approximately 1,600,000 troops in the army; the national guard (*q.v.*) was completely in federal service; new military units—parachute troops, air-borne troops, ski troops, mountain troops, armoured motorized units, mechanized units, tank units, balloon barrage units and others—had been created. Training of this new, huge body of troops had included manoeuvres on a scale never before attempted in the United States. Starting early in the year with regimental terrain problems, this active-duty training had progressed to corps manoeuvres, followed by army manoeuvres in the Louisiana area and in the Carolinas. For these, G.H.Q., under the direction of Lieut. Gen. Leslie McNair, had formulated military problems for solution by the army commanders. For the first time, the four-army plan marched off blueprints onto battlefields. The manoeuvres were unique in that they were "free." There were no preliminary scenarios with foreknown situations and reactions. Instead, shortly before "D" day, commanders involved were given the military problem and told they were on their own. The stimulus to initiative was obvious. Gen. McNair summarized the year's manoeuvres in the Dec. 1, 1941 issue of the *New York Times*, in an article by Hanson W. Baldwin: "The United States army, given complete equipment, could fight effectively. . . . We have made splendid progress. But the simple fact is that you can't perfect units in one year's work."

However, some salient lessons were learned—the mass use of tanks; the effectiveness of mobile massed guns against tanks; the need for infantry to accompany armoured divisions; the necessity for the creation of more motorized divisions; the fact that ground troops must learn to be sensible of the real threat of air attack; and that discipline must be improved. In the equipment field, the manoeuvres demonstrated the need for speed-up in production of anti-aircraft guns, with their equipment and ammunition; the pressing need for long-range, low altitude pursuit planes capable of long air patrols; and the importance of producing more medium tanks.

Back of this peak point in the military program of 1941 lay the spade work which had provided for assimilating drafted men in 29 reception centres, where they were classified, uniformed, and then distributed among 21 replacement training centres for basic training. The ground forces thus being created provided for four armies of nine army corps including 29 divisions, an ar-

ORGANIZATION of the War Production Board as announced January 21, 1942





U. S. ARMY INSIGNIA

moured force of four divisions, troop units for Hawaiian, Philippine, Puerto Rican and Caribbean areas, and a supplemental air force expanded in October to 84 combat groups. This force had to be prepared to fight in any climate, under any conditions, since the globe had become the military sphere of action. The public is accustomed to see the ultimate trained soldier as a snappy, alert, uniformed, armed man. To bring him to that point and fit him as an integral unit of national defense, many lines of effort must be followed to their conclusion. It is necessary to survey and secure camp sites, build camps and cantonments, formulate adequate tables of organization, design and produce all needed uniforms, produce all necessary ordnance, and train the civilian recruit in the use of tools of the profession of arms.

Mechanized and motorized equipment was produced in 1941 in greatly increased quantities—tanks, reconnaissance cars, self-propelled artillery, armoured cars. Ordnance equipment, carbines, grenades, rifles, anti-aircraft and anti-tank guns, howitzers, gas masks and like items kept pace in flowing out to troops in finished form. (*See* also MUNITIONS OF WAR.)

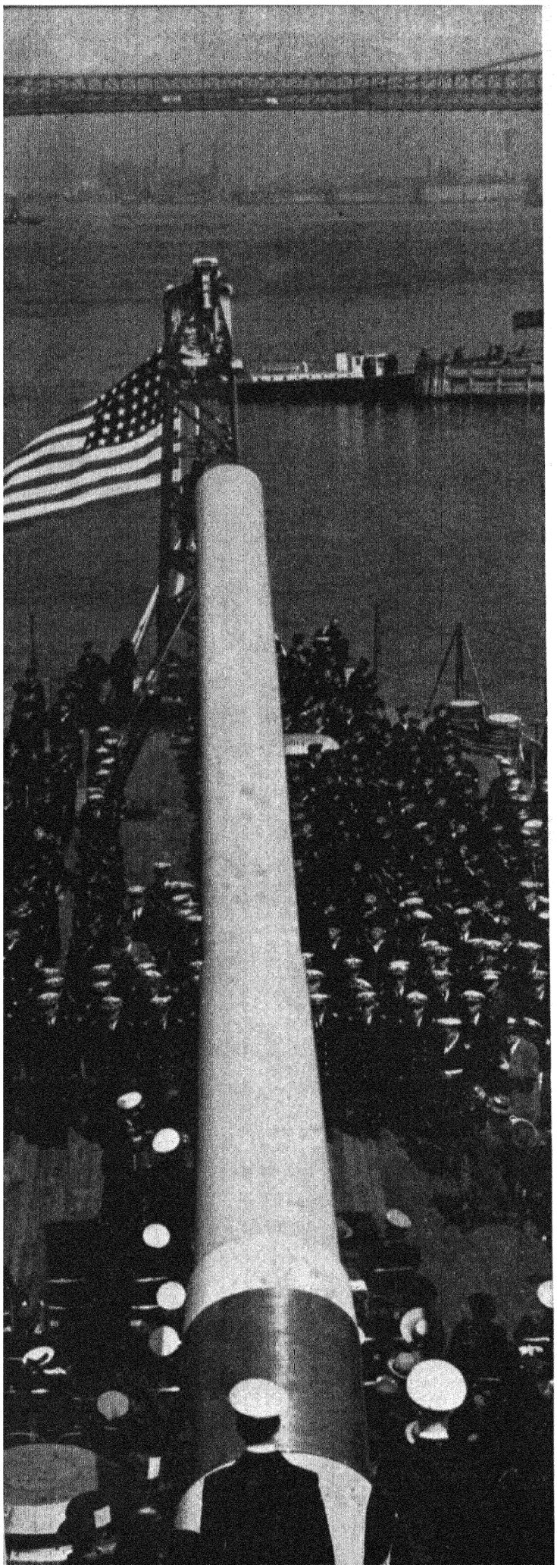
Outlying troop garrisons soon showed the influence of the expanded military defense program. Alaska's previous garrison of a few hundred was increased to several thousand; strength in Panama was more than doubled; less than a normal thousand in Puerto Rico jumped to over 10,000. Other numbers of troops were sent to Dutch Guiana, Iceland, Newfoundland, Bermuda, Trinidad, Jamaica, Saint Lucia, Antigua, British Guiana and the Bahamas to make effective the military bases on British territory

in the western hemisphere.

Certain statistical data and comparisons show some of the army's progress toward better national defense during 1941. On June 30, 1940, aggregate army strength was under 300,000; on June 30, 1941, it was 1,462,347; the engineer corps, taking over construction responsibility from the quartermaster corps, undertook projects aggregating construction costs of more than $4,000,000,000; the air corps increased in numbers of personnel until it stood second to the infantry in size; arrangements were perfected for assuring an army food supply costing $750,000 a day; as a transportation achievement, 28,839 carloads of freight and 1,139,199 men were moved by the quartermaster corps; money appropriated to Nov. 1, 1941 for ordnance items totalled $3,181,500,000; powder manufacture was increased 1,000% and small arms ammunition 1,200% in 1941; land under control of the secretary of war for military purposes jumped from 2,500,000 ac. in 1940 to more than 10,000,000 ac. in 1941; army chaplains were increased in number from 600 to 1,550; national guard strength rose to over 300,000; in April 1941, 1,427 planes were manufactured; in September, their production crossed the 1,850 mark, a figure more than three times that for production in Aug. 1940. For World War I the U.S. spent a total of $22,000,000,000; by May 1941, the U.S. had spent or appropriated nearly $52,000,000,000, and *was not then at war.*

(*See* also ARMIES OF THE WORLD.)

Air Force.—The question of creating a separate U.S. air force was one which evoked considerable comment during 1941. In a newspaper dispatch released on Nov. 10, Undersecretary of War



Robert P. Patterson stated the war department's opposition to congressional agitation for creation of a wholly independent air force as a third division of the armed forces. He asserted that a separate air force would mean a "triplication" of army and navy efforts, without any corresponding multiplication of effectiveness. He stressed the necessity for teamwork in any military organization, and rated the U.S. army air forces as the finest in the world, since they combined the best features of Britain's R.A.F. and the nazi *luftwaffe*. In answer to citation of the R.A.F. as demonstrating the value of an independent air force, Patterson said, ". . . the independence of the R.A.F. was probably a factor in the loss of Crete, because division of command meant division of effectiveness. Here an inferior German force won a signal victory with an organic air force—an air force, that is, which was not operating independently, but as an integral part of a task force which included land and sea units."

Citing the fact that all of the Atlantic bases in the Caribbean area, air and ground troops alike, had an air officer in command and that the same situation was true of the U.S. forces in Newfoundland, he disposed of the charge that the air force was being subordinated.

(*See* also AIR FORCES OF THE WORLD.)

Navy.—This arm of U.S. defense had before it in 1941 a clear-cut program—the achievement of a two-ocean navy, a balanced force which, when complete, would present the greatest array of naval fighting power ever assembled. At the close of 1941, the naval defense program was not only up to schedule but ahead in many phases. The program of expansion afloat and ashore had been kept in balance in spite of exigencies which had thrown exceptional loads on certain points. Notable in this regard was the necessary repairing of British vessels coming into U.S. waters for overhaul.

With respect to shore facilities, the bureau of yards and docks showed at the end of 1941 that there had been no lag in schedule of any of the original base projects planned. With the exception of Trinidad and the Bahama islands, all base locations obtained from Great Britain in the trade for old destroyers in Sept. 1940 were either in partial or complete operation.

The record of the navy's expansion in aviation shore establishments was outstanding. From seven such establishments extant in 1939, the number in 1941 was brought up to 30, supplemented by additional auxiliary bases and training stations. Those completed in 1941, and those projected, were to take care of a 15,000-plane program. The first basic advance was made in this field in 1940, when use was made of a special $7,000,000 appropriation to provide facilities to operate the aviation patrol for the enforcement of neutrality.

The construction of a major naval air station or base usually requires 2,000 ac. to 2,500 ac. of land bordering on water suitable for the landing and taking off of seaplanes. Berthing of aircraft carriers may be necessary in some cases. A landplane area a mile square or larger is needed; also the necessary space for hangars, shops and other shore adjuncts.

The naval air stations at Quonset point, R.I., and Corpus Christi, Tex., were striking examples of the possibilities of pressure accomplishment. The contract for Quonset was signed in July 1940; construction costs were estimated at $24,000,000. The normal time of construction would have been two or three years, but the station was commissioned July 12, 1941.

Corpus Christi, at an approximately equal cost, was also contracted for in July 1940. It was commissioned in March 1941; a class of fliers who had received their preliminary instruction at

THE 35,000-TON U.S.S. "NORTH CAROLINA" was commissioned at Brooklyn navy yard April 9, 1941. This battleship, the first built in the U.S.A. since 1923, carries nine 16-in. guns

auxiliary naval reserve air bases was graduated from Corpus Christi in 1941.

However, establishment of naval air stations was not an easy matter. Many knotty problems were faced, since the geographic range included the subarctic regions, where many feet of frozen peat had to be removed before even temporary structures might be built, and the tropics, where dense jungles had to be cleared before initial work could be undertaken.

The speed with which the navy was accomplishing construction of its outlying and lend-lease bases in 1941 had a very direct bearing on defense of not only the main coast line of the United States, but also the vital Panama canal area. The most northern of these defenses was located in Newfoundland, with the line extending south with the establishment of bases in the Bahama islands, at Bermuda, Antigua, Saint Lucia, Trinidad and Georgetown in British Guiana, supplemented by additional stations located at San Juan, P.R.; Saint Thomas in the Virgin islands; Kingston in Jamaica; and expansion of the existing base at Guantánamo, Cuba.

The program for development of an air base in Midway island was completed far ahead of schedule, and exceptional speed was registered in developing Alaskan air bases at Sitka, Kodiak and Dutch Harbor.

Another major Pacific project on which outstanding progress was made was the great drydock at Pearl Harbor in Hawaii. The dock, "in the dry," was basically complete and capable of taking any of the navy's battleships or aircraft carriers in 1941. The Kaneohe air base on the island of Oahu was in operation, and, prior to the Japanese assault on Dec. 7, 1941, much improvement work had been completed at Palmyra and Johnston islands.

On June 30, 1940, personnel of the navy on active duty was 157,986; on Nov. 1, 1941, the corresponding total was 311,861. The marine corps (*q.v.*) in the same period climbed from 27,958 to 64,053. The coast guard (*q.v.*) which became a part of the navy, had on Nov. 1, 1941, a military personnel of 23,879, a civilian personnel of 4,990, and 282 vessels of all classes.

The total tonnage of combatant type vessels, the striking power of the floating navy, under construction July 1, 1940, was 823,335. In Oct. 1941 this figure had jumped to 2,138,590 tons.

Table I.—*U.S. Combatant Ships*

Type	November 1941			June 1940		
	Built	Building	Total	Built	Building	Total
Battleships	17	15	32	15	10	25
Aircraft carriers	7	11	18	5	3	8
Cruisers	37	54	91	35	10	45
Destroyers	170	192	362	219*	48	267
Submarines	113	73	186	95	25	120
Totals	344	345	689	369	96	465

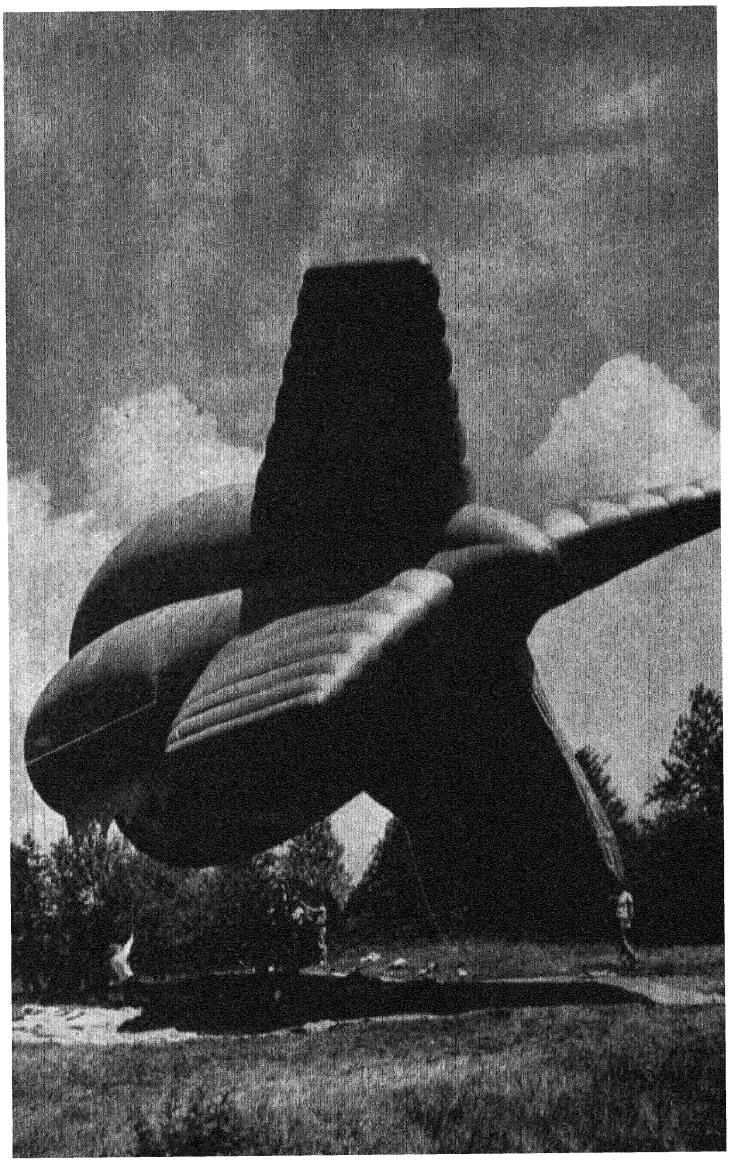
*Fifty destroyers included here were transferred to Great Britain in 1940.

The bureau of yards and docks expended $420,851,562 in the fiscal year 1941, as against $81,864,734 in the previous fiscal year. A total of 712 contracts amounted to $603,199,632 in 1941 as compared with 688 contracts involving $183,762,017 in 1940. Drydock construction for 1941 doubled that of 1940 and involved approximately $200,000,000.

Table II.—*Construction Progress of U.S. Combatant Ships in 1941*

Type	Commissioned	Launched	Keels laid
Battleships	2	3	2
Aircraft carriers	1	0	3
Cruisers	0	6	17
Destroyers	13	18	75
Submarines	10	13	23
Totals	26	40	120

As for general construction by the U.S. navy, a total of 41 new section bases for local defense operations was undertaken in 1941, and 27 were completed and in use at the end of the year. All ammunition depots were greatly expanded, and construction was



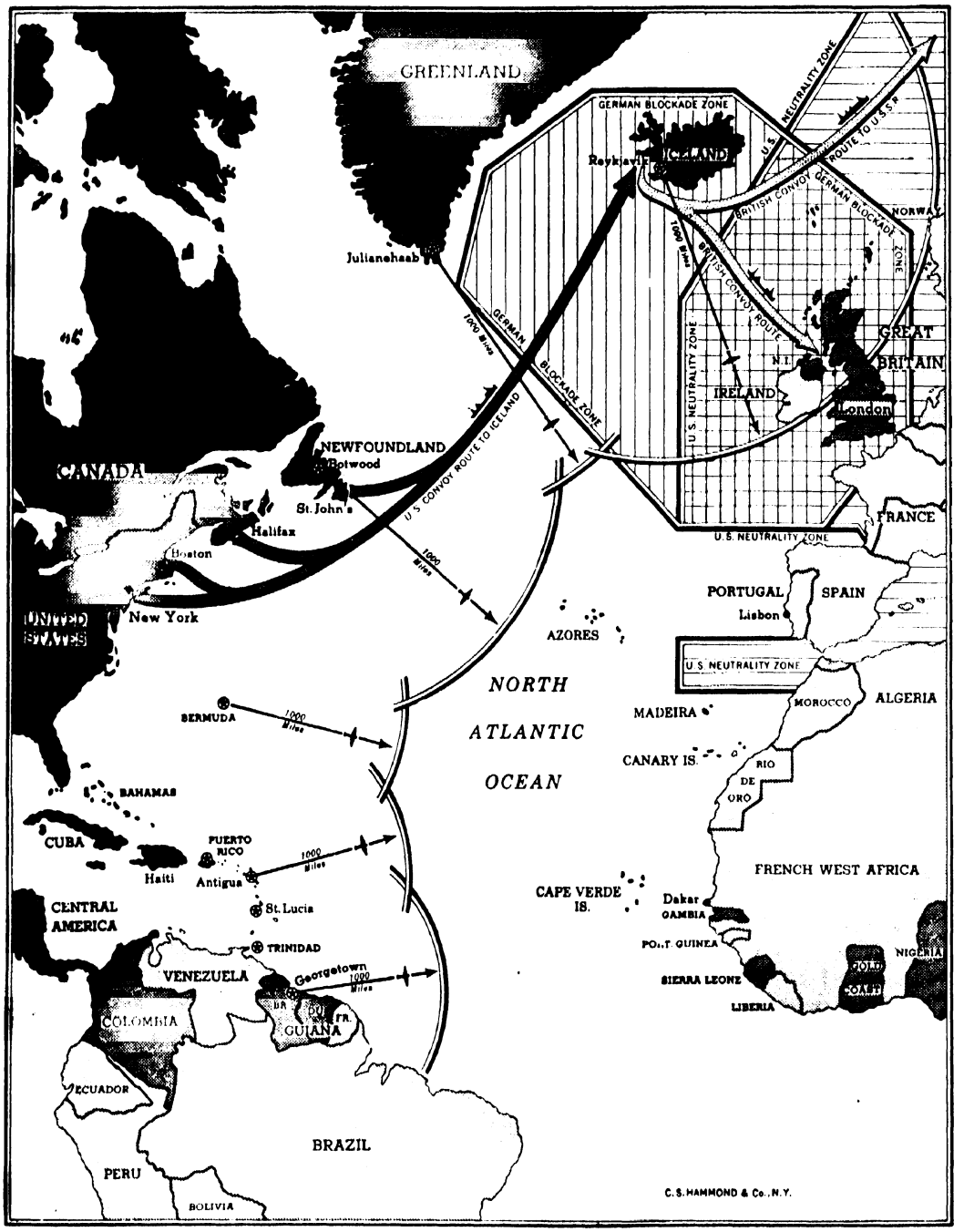
ANCHORING a U.S. barrage balloon after a test flight near Akron, Ohio in 1941. A training school for ground crews was established during the year at Camp Davis, N.C.

begun on six new ones. Three new submarine bases were commissioned, and three others were under construction in 1941. For the marine corps, two new bases were under construction on the Atlantic coast and two major fleet supply depots neared completion.

Indicative of the navy's rapid expansion in 1941 was the fact that contracts in the fiscal year 1941 totalled $2,196,980,630.51, or an 800% increase over the preceding fiscal year. (*See* also NAVIES OF THE WORLD.)

Missions to Other Countries.—A military mission was sent to China, headed by Brigadier General John Magruder. Later in the year, tentative overtures were made toward extending lend-lease aid to Turkey. However, that nation declined, announcing its intention to preserve its neutrality. Near the close of December, a military mission was sent to the Russian capital at Kuibyshev. This group was headed by Major General John N. Greely, son of the famous arctic explorer.

Defense Agencies.—A study of civilian activities in connection with national defense immediately leads to consideration of the Office for Emergency Management (*q.v.*), an administrative device. This body, responsible directly to the president, included, at the end of 1941, the Office of Production Management (*q.v.*); the Division of Administration; the Division of Central Administrative Services; the Lend-Lease administration (*q.v.*); the Defense Communications board (*q.v.*); the National Defense



FACTORS IN THE BATTLE OF THE ATLANTIC before U.S. entry into the war in Dec. 1941. U.S. convoys to Iceland could not enter the prohibited neutrality zone (proclaimed Nov. 4, 1939) but had to pass through the blockade zone proclaimed by Germany against Great Britain. The map also shows the effective range of planes from the various bases leased by Great Britain to the U.S., and from Reykjavik, Iceland

Mediation board (*q.v.*); the Supply Priorities and Allocations board (*q.v.*); the Division of Defense Housing Co-ordination; the Office of the Coordinator of Inter-American Affairs; the Division of Transportation; the Office of Defense Health and Welfare Services; the Office of Scientific Research and Development (*q.v.*); and the Office of Price Administration (*q.v.*).

The Office of Production Management in Nov. 1941 had in itself 11 subdivisions. Outside the OPM stood the Office of Petroleum Co-ordinator (responsible to the secretary of the interior); the Board of Economic Warfare (*q.v.*); The Co-ordinator of Information; the Office of Facts and Figures; the Permanent Joint Board of Defenses of the United States and Canada; and the Office of Agricultural Defense Relations.

Of those named, the Office of Production Management, created Jan. 7, 1941, had the greatest bearing on defense projects. The success of its operations depended upon its ability (1) to divert production facilities to necessary war material production; (2) to keep the big companies from monopolizing defense work; (3) to bring every idle machine into use by subcontracting and farming out as much work as possible; and (4) to get and keep control of all needed raw materials and regulate their outward flow in finished form. To do the job, OPM in 1941 carried 3,000 people on its pay roll, which was budgeted at $10,000,000 a year.

It was early recognized by OPM that shortages were imminent in certain strategic raw materials. This was especially true in the case of seven essential metals—tin, tungsten, mercury, manganese, chrome, nickel and antimony. Every means, even to financing individual prospecting, was resorted to in order to assure a supply of these. Like shortages were realized in the supply of rubber and aluminum. Prompt measures were taken to curtail sharply nondefense use of such strategic materials, and, by the end of 1941, many substitutes were beginning to come on the market for formerly familiar articles. Cellophane, tin foil, lead foil, all forms of zippers had become taboo for ordinary civilian use. A drive was made in the summer of 1941 for the collection of household utensils made of aluminum, and old newspapers and magazines no longer found their way into trash cans or furnaces. Early in Jan. 1942 the Office of Price Administration banned the production of new automobiles; the sale of new tires had already been rationed.

When OPM was created, considerable demand was made through the press for the appointment of William S. Knudsen (*q.v.*) as the one-man boss of the new office. Instead, President Roosevelt named Sidney Hillman (*q.v.*) as his associate. The idea back of this arrangement was that there were three elements in the production picture—management (Knudsen), labour (Hillman), and the buyer (Stimson and Knox of the army and navy, respectively).

The new machine did not function any too smoothly, and critical-minded commentators continued up to Jan. 1, 1942, to insist on the vesting of control in one man, as had been done in the appointment of Bernard Baruch in 1917–18 as head of the War Industries board.

Recognizing the need for reorganization of the OPM, President Roosevelt appointed Samuel I. Rosenman, New York supreme court judge, to draft a plan. The ultimate result of his efforts was the creation on Aug. 28, 1941, of a new authoritative body called

the Supply Priorities and Allocations board (SPAB), with Vice-President Wallace (*q.v.*) as its chairman. Since Wallace had already been named chairman of the Economic Defense board, he stood in a rather commanding position in production matters. Donald Nelson (*q.v.*) was named as executive director of the newly created SPAB, and the remainder of the board's membership included Stimson, Knox, Knudsen, Hillman, Hopkins and Henderson. The latter's connection with SPAB did not interfere with his duties as price administrator. SPAB was set up (without pay roll or employees) to referee the continual points of difference between the price administrator and the priorities division of OPM. The former was concerned with controlling prices to combat inflation and protect the citizen consumer; the latter had only in mind getting necessary goods to the places where they could be quickly manufactured for military needs.

(*See* also PRIORITIES.)

The realization in 1941 that inflation menaced the U.S. economic and industrial structure even more than did strikes, made necessary the setting up of some form of price-control machinery. On April 12 the Office of Price Administration and Civilian Supply was established, with Leon M. Henderson (*q.v.*) as its head. The name of this agency was later shortened to Office of Price Administration.

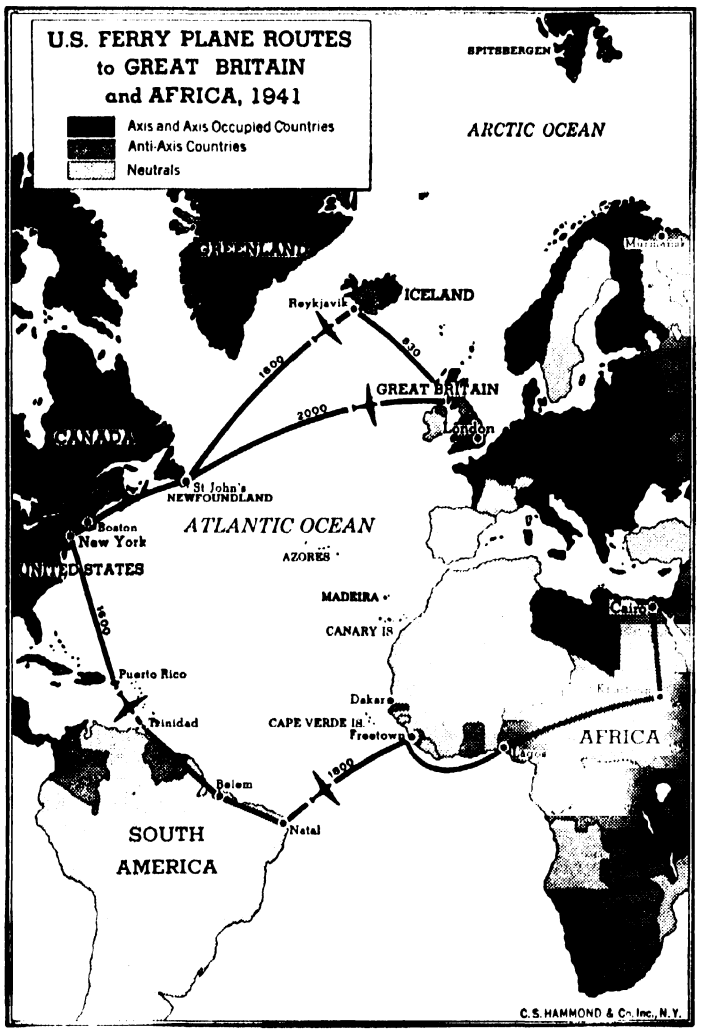
Price control was a necessary adjunct to stabilization of economic policy, but it was only one item. Paramount was the determination of how the mounting costs of war were to be met. Three plans presented themselves: (1) borrowing; (2) some form of inflation; (3) increase in taxes with a view to reaching a pay-as-you-go basis. The danger of inflation is such as to need no specific comment. The danger in borrowing is that it places too much power in the hands of small groups of the country's population. The solution in 1941 appeared to lie in putting the burden on the shoulders of all the people. As an aid to forestalling inflation, considerable money was taken out of circulation by the sale of defense bonds issued by the government. These were offered to the public in May. On Dec. 31, 1941, the president announced that thenceforth they would be referred to as "war bonds."

All financial matters connected with national defense insofar as they related to the OPM were closely correlated with other government agencies. War department contracts had first to be cleared through OPM, and in instances such as were produced by the acute shortage of aluminum, the OPM was compelled to seek the financial help of Jesse Jones (*q.v.*), head of the Reconstruction Finance corporation, in financing the erection of new plants to produce aluminum.

The Office of Civilian Defense (*q.v.*) was created to: (1) translate defense needs to states and towns; (2) co-ordinate civilian effort, and (3) boost national morale. The organization was headed by Mayor Fiorello La Guardia (*q.v.*) of New York city and included such prominent volunteer assistants as Mrs. Franklin D. Roosevelt and Mrs. Henry Morgenthau.

Labour.—During 1941 labour trouble, manifest in strikes, interfered seriously with production schedules for army and navy needs. The plant of the Allis-Chalmers company was struck for a long period, and termination of the strike through the efforts of William Hammett Davis as mediator was a matter of long-sustained effort to arrive at some basis of settlement. Trouble of the same character occurred in the Ford plant; in the Todd drydocks in Galveston, Tex.; and in great logging camps in the northwest. The North American Aviation corporation, Inglewood, Calif., suffered from a strike, as did shipyards connected with marine construction on both coasts; in Jersey City, the National Bearing Metals corporation lost time on contracts by reason of strikes; in August it was necessary for the president to order that the shipyard at Kearny, N.J., be taken over and operated by the navy because the Federal Shipbuilding and Drydock company had repeatedly refused to accept strike settlement measures offered by the National Defense Mediation board; the Bendix company incurred U.S. governmental displeasure in connection with labour troubles in its plant; the Buffalo Forge company and the Fairfield Steel works at Birmingham, Ala., settled their several differences and went back to work in October; in the coal mining industry, the captive mine strike in soft coal mining provoked near pitched-battle relations between President Roosevelt and John L. Lewis, C.I.O. president of the United Mine Workers. Speaking before the National Association of Manufacturers in the Waldorf-Astoria, New York, the chief of OPM, William Knudsen,

U.S. CARIBBEAN DEFENSES, showing existing naval bases and the bases leased from Great Britain in Sept. 1940



stated: "I can't for the life of me understand how in a declared unlimited national emergency, such foolishness as strikes can go on.... We have all kinds of work to do and then we have to stop and argue about jurisdictional disputes, organizational disputes and God knows what." The closed shop issue caused more trouble than the matter of wages and hours in 1941. The year closed on a hopeful note, however, when workers on the west coast requested the privilege of working overtime, free, to catch up time lost on production schedules because of strikes. (*See* also LABOUR UNIONS; STRIKES AND LOCK-OUTS.)

"The Atlantic Charter."—For 13 days in Aug. 1941, President Roosevelt dropped from sight in Washington, D.C. A veil of secrecy shrouded his movements, and it was not until his return that the incidents of his trip were made public. Somewhere in the North Atlantic he had met Prime Minister Winston Churchill (*q.v.*). The two exchanged ship visits and held frequent conferences from which emerged a document which came to be known as the "Atlantic Charter," an attempt to arrive at a definition of the aims of Great Britain and the United States as they concerned each other and as they involved other countries. The so-called charter contained eight points; viz.:

1. The U.S. and Great Britain seek no aggrandizement, territorial or other.

2. They desire to see no territorial changes that do not accord with the freely expressed wishes of the people concerned.

3. They respect the right of all peoples to choose the form of government under which they will live; and they wish to see sovereign rights and self-government restored to those who have been forcibly deprived of them.

4. They will endeavour, with due respect for their existing obligations, to further the enjoyment by all states, great or small, victor or vanquished, of access, on equal terms, to the trade and to the raw materials of the world which are needed for their economic prosperity.

5. They desire to bring about the fullest collaboration between all nations in the economic field with the object of securing, for all, improved labour standards, economic advancement, and social security.

6. After the final destruction of the nazi tyranny, they hope to see established a peace which will afford to all nations the means of dwelling in safety within their own boundaries, and which will afford assurance that all the men in all the lands may live out their lives in freedom from fear and want.

7. Such a peace should enable all men to traverse the high seas and oceans without hindrance.

8. They believe that all of the nations of the world, for realistic as well as spiritual reasons, must come to the abandonment of the use of force. Since no future peace can be maintained if land, sea or air armaments continue to be employed by nations which threaten, or may threaten, aggression outside of their frontiers, they believe, pending the establishment of a wider and permanent system of general security, that the disarmament of such nations is essential.

Later in the year, Churchill visited President Roosevelt in Washington, D.C., and addressed members of both houses of congress on Dec. 26, 1941, stressing the need of cementing the aims of Great Britain, the U.S.S.R. and the United States to the end that Hitlerism should be obliterated. (*See* also ABRASIVES; ADVERTISING; AIR CONDITIONING; AIRPORTS AND FLYING FIELDS; AMERICAN IRON AND STEEL INSTITUTE; AMERICAN LEGION; ANTHROPOLOGY: *National Defense;* BUDGETS, NATIONAL; BUILDING AND BUILDING INDUSTRY; BUSINESS REVIEW; CANNING INDUSTRY; CIVILIAN CONSERVATION CORPS; COAST AND GEODETIC SURVEY; CONSUMER CREDIT; EDUCATION; EMERGENCY MANAGEMENT, OFFICE OF; ENTOMOLOGY; FALK FOUNDATION, THE MAURICE AND LAURA; FEDERAL BUREAU OF INVESTIGATION; FEDERAL HOUSING ADMINISTRATION; FORESTS; FURNITURE INDUSTRY; GOVERNMENT DEPARTMENTS AND BUREAUS; HISPANIC AMERICA AND WORLD WAR II; HOUSING; INTERSTATE COMMERCE COMMISSION; JEWISH WELFARE BOARD; LAW: *National Defense;* LIBRARIES; LUMBER; MASSACHUSETTS INSTITUTE OF TECHNOLOGY; MEDICINE: *Medicine in the War;* MUNICIPAL GOVERNMENT; NATIONAL GUARD; NATIONAL LABOR RELATIONS BOARD; NATIONAL YOUTH ADMINISTRATION; PAPER AND PULP INDUSTRY; PATENTS; PLASTICS INDUSTRY; POLICE; PRODUCTION MANAGEMENT, OFFICE OF; PSYCHOLOGY; PUBLIC HEALTH ENGINEERING: *War and Water Supply;* PUBLIC UTILITIES; RADIO: *Programs During the War;* RAILROADS: *Office of Defense Transportation;* RUBBER AND RUBBER MANUFACTURE; RURAL ELECTRIFICATION; SALVATION ARMY; SAVINGS BANKS, MUTUAL; SHIPPING, MERCHANT MARINE; SUPPLY PRIORITIES AND ALLOCATIONS BOARD; TENNESSEE VALLEY AUTHORITY; UNITED STATES; WOMEN'S CLUBS, GENERAL FEDERATION OF. Also *see* under the various countries.)

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(R. S. T.)

Defense Aid, Office of: *see* LEND-LEASE ADMINISTRATION, OFFICE OF.

Defense Board, Economic: *see* ECONOMIC WARFARE, BOARD OF.

Defense Bonds: *see* SAVINGS BANKS, MUTUAL.

Defense Communications Board.

The Defense Communications board,

created by President Roosevelt in 1940, co-ordinated plans in 1941 to utilize and safeguard U.S. radio and wire services under any emergency. A planning agency without operating or procurement functions, the board comprises representatives of various federal departments and agencies concerned with electrical communications. Its members are Chairman James Lawrence Fly of the Federal Communications commission; Assistant Secretary of the Treasury Herbert E. Gaston, in charge of the coast guard; Major General Dawson Olmstead, chief signal officer of the army; Rear Admiral Leigh Noyes, director of naval communications; and Breckinridge Long, assistant secretary of state in charge of the division of international communications. Advising the board are committees representative of labour, industry, amateurs, aviation, cable, domestic broadcasting, international broadcasting, radio communications, telegraph, telephone and government, state and municipal facilities, with civilian defense and priorities liaison committees. (*See* also FEDERAL COMMUNICATIONS COMMISSION.)

Defense Mediation Board, National. The National Defense Mediation board was created by U.S. executive order March 19, 1941, to adjust labour disputes in defense industries. Three steps were set forth for the board to follow in settling these controversies: (1) collective bargaining between the parties before the board; (2) if that failed, voluntary arbitration; and (3) if both of these failed, findings of fact and recommendations, which might be made public. Disputes were to reach the board only through certification by the secretary of labour, after the United States Conciliation service had been unable to settle them.

The board was originally composed of 11 members—four management, four labour and three public. Labour's representation was equally divided between the American Federation of Labor (*q.v.*) and the Congress of Industrial Organizations (*q.v.*). As the pressure of work increased, alternates from all three groups were added to the board, which reached a top membership of 41 during 1941. The first chairman, C. A. Dykstra, was succeeded July 1 by William H. Davis. Cases were heard by panels of the board, representing the three groups, which had the same authority as the full board. Only three cases were brought before the full board.

During 1941, 113 cases were certified to the board, involving a total of 1,190,789 men. Of these, 80 cases, involving 852,347 men, were settled at the year's end. Starting with a large backlog of unsettled defense strikes, the board gradually acquired the confidence of labour and management in its ability to settle disputes, so that it was able to postpone threatened strikes or bring an end to existing strikes merely by promising the parties a swift and impartial adjustment of the controversy. This voluntary method was working so well by the close of 1941 that during the whole month of December there was not a single stoppage of production in any of the 30-odd cases, involving nearly 350,000 men, still awaiting settlement.

The most important controversies handled by the board were those involving 7,500 employees of the Allis-Chalmers Manufacturing company, of Milwaukee, 160,000 employees of General Motors, 400,000 bituminous coal miners and 225,000 trucking employees in 12 midwestern states. Only four times did the board fail to settle controversies and have to refer them to the president for further action. The first involved North American Aviation, Inc., where the union called a strike during mediation, in violation of an agreement with the board; the second and third, involving Federal Shipbuilding and Drydock company, and Air Associates, Inc., where the companies refused board recommendations; and the fourth, the captive coal mine dispute, where the union rejected a board recommendation, and the C.I.O. members of the board resigned. By executive order the president ordered the army to take possession of the first and the third plants, the navy, the second. In the fourth case, the president's suggestion of arbitration was accepted.

Shortly after the United States declared war, a national conference of labour and management, convened by the president Dec. 23, 1941, agreed to settle disputes for the duration without resort to strikes or lock-outs, and recommended the setting up of machinery for peaceful settlement. This machinery was to supplant the National Defense Mediation board early in Jan. 1942. (W. H. Ds.)

The National Defense Mediation board was abolished by President Roosevelt Jan. 12, 1942, and all its duties, records, funds and employees were transferred to the National War Labor board, created by executive order on that day with William H. Davis as chairman and with 12 members representing industry, labour and the public. (*See* also LABOUR UNIONS.)

Defense Research Committee, National: *see* SCIENTIFIC RESEARCH AND DEVELOPMENT, OFFICE OF.

De Gaulle, Charles: *see* GAULLE, CHARLES DE.

Delaware. A state of the middle Atlantic seaboard, first to ratify the federal constitution (Dec. 7, 1787), popularly called the "Diamond state." Area, 2,057 sq.mi. (land, 1,978; inland water, 79). Pop. (1940), 266,505, of which 139,432 were urban and 127,073 rural. Native white numbered 215,695; foreign, 14,913; Negro, 35,820. Capital, Dover, 5,517. The only larger city is Wilmington (112,504).

History.—As 1941 ended, volunteer aeroplane spotters scanned the skies, retired blacksmiths were back at their forges, tire retreading firms were swamped with business, and in Wilmington B milk went up to 14 cents a quart. The general cost of living in Wilmington was 8.8% higher than in the preceding December; foodstuffs were up 17.4%, house furnishings 14.4%, housing 2%. But business was better (according to Babson, 20%), and in this area expansion in defense industries was expected to more than offset decline in other lines. Records were broken for Wilmington postal receipts (1941, $1,423,461; 1940, $1,307,625) and New Castle county marriage licences (1941, 6,614; 1940, 4,444).

The legislature passed 1,205 pages of laws, including: (1) a Fair Trade act permitting manufacturers to fix minimum resale prices for trademarked commodities; (2) acts for permanent automobile registration, and increasing highway speed limits up to 55 mi. per hour; (3) repeal of the ancient "blue laws" prohibiting worldly labours and amusements on the Sabbath; (4) an improved workmen's compensation law; (5) new regulations governing registration and election officials. The governor, in 1941, was Walter W. Bacon; the lieutenant governor, Isaac J. MacCollum.

Education.—In 1941 there were 175 elementary and 44 secondary schools with a total enrolment of 43,948 and a teaching staff of 1,720. The University of Delaware (Newark) had an enrolment in Dec. 1941 of 936 and a teaching staff of 128. The only other state institution is the State College for Colored Students (Dover); enrolment, 132; staff, 23.

Communications.—There were 3,930 miles of highways in 1941, all state, including about 1,000 miles of dirt roads, mostly in Sussex county; expenditures for the fiscal year to June 30, were $4,468,017.68, including federal aid amounting to $737,421.76. Railroad mileage (1938), 297. Water-borne commerce (1938), 564,430 tons. Airways, mileage (1941) about 10 (across northwestern corner of state); number of airports (est.), 8. Number of telephones (Nov. 1, 1941), 57,379.

Banking and Finance.—In 1941 there were 30 state banks with assets of $298,652,069.70 and deposits of $250,244,519.23. The 15 national banks in Delaware had assets of $25,659,786.17 and deposits of $19,916,903.44; 43 building and loan associations had assets of $13,645,917.31.

Agriculture.—The value of all crops in 1941 was $11,653,000; acreage was 348,980. Cash income from crops and livestock in 1941 was estimated at $22,125,000; from government payments, Jan.-Oct., $482,000. An extremely dry crop season reduced the yields of potatoes, sweet potatoes, hay and alfalfa. (*See* table on page 228.)

Manufacturing.—The value of products in 1939 was $114,753,652; salaries and wages of $30,210,159 were paid to 28,162 persons. The prin-

Leading Agricultural Products of Delaware, 1941 and 1940

Crop	1941	1940
Corn, bu.	3,925,000	3,800,000
Apples, bu.	1,794,000	1,900,000
Hay, tons	90,000	91,000
Wheat, bu.	1,332,000	1,272,000
Tomatoes, tons	39,000	37,000
Strawberries, crates	207,000	400,000
Lima beans, tons	8,930	5,650

cipal industries in 1939 were chemicals and allied products, valued at $20,350,136; iron and steel and products, $12,619,290; and leather, $11,784,718.

Mineral Production.—The value of all minerals produced in 1939 was $401,333.

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Democracy is not only a technique of government, based upon freely elected representative institutions, and upon an executive responsible to the people; it is based upon the belief of the equality of all individuals and in the equal right of all to life, liberty (including the liberty of thought and expression) and the pursuit of happiness. The denial of this equality and of individual liberty, the proclamation of authoritarianism and of the inequality of men and races as a "new order," is characteristic of fascism, which arose as a conscious and aggressive world-wide opponent of democracy.

The world-wide threat to democratic freedoms and institutions brought with it a reassertion of the faith in democracy and of the determination to maintain the liberties of the democratic peoples even in the face of a most determined aggression. At the same time the awareness which the involvement in war brought with it produced in Great Britain an unprecedented intensification of the democratic spirit. The old class barriers which had maintained themselves as a survival of old England were waning, the workers accepted an increasing part of leadership and responsibility, and a spirit of national unity and of a common destiny embraced all groups of English society as never before. The continental European nations, suffering in an unprecedented way under the fascist regime imposed upon them by German conquests, reasserted their will to democracy, in spite of mass executions and the terrorism of the Gestapo. A wave of unrest swept Norway, the Low Countries, France, Czechoslovakia, Serbia and Greece in the fall of 1941. A similar new vigour of the democratic state was noticeable throughout Latin America where, influenced by the growing strength of the United States and the successful British resistance, many governments declared their increasing readiness to co-operate with the United States in the defense of hemispheric liberties and of democratic institutions. In the United States the declarations of war by Japan and Germany brought the nation to a united realization of the world-wide threat against democracy. (*See* also COMMUNISM; EDUCATION; FASCISM; FRANCE; GERMANY; GREAT BRITAIN; ITALY; JAPAN; PACIFISM; UNITED STATES; UNION OF SOVIET SOCIALIST REPUBLICS.)

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Democratic Party. Following the re-election of President Roosevelt for a third term, the Democratic party, as it entered 1941, continued in control of the executive and legislative branches of the national government. When the 77th congress convened on Jan. 3, the Democrats held 66 senate and 267 house seats. Edward J. Flynn of New York remained as chairman of the Democratic National committee. In the house, Representative Sam Rayburn of Texas held office as speaker, with Representative John W. McCormack of Massachusetts as floor leader. In the senate, Alben W. Barkley of Kentucky continued as majority leader.

With the war already engulfing three continents, and moving ominously nearer the western hemisphere, the Democrats, as the party in power, faced heavy responsibilities in 1941. The country was too absorbed in watching the unfolding of the grim international drama, and in debating the future role of the United States in the fight against the axis, to take much interest in domestic politics. Compared with other years, there was little activity on the political front at home.

The war emergency strengthened the president's leadership in congress. Measures to expand the army and navy received quick approval by members of both parties in house and senate. Despite strong Republican opposition, congress voted to extend until June 30, 1943, the $2,000,000,000 stabilization fund, and the president's power to alter the gold content of the dollar. Early in the session congress also authorized an increase in the statutory public debt limit from $49,000,000,000 to $65,000,000,000.

With large Democratic majorities in both houses, the administration had little difficulty in securing prompt enactment of the bulk of its legislative program. Among the important measures approved were the 1941 Revenue act, to raise an additional $3,553,400,000 annually to defray part of the costs of the expanding defense effort; a bill to increase by $1,500,000,000 the borrowing authority of the Reconstruction Finance corporation, and the lend-lease bill, approved by the house on Feb. 8, 260 to 165, and by the senate on March 8, 60 to 31.

Though the Democrats supported most of the administration measures, on several issues the majority found itself divided. Fifteen Democrats in the senate and 53 in the house voted against the administration proposal to amend the Neutrality act to permit the arming of U.S. merchant ships and to authorize their entry into combat zones.

As a defense measure, the administration asked congress to extend for 18 months the military service of citizens called to the colours under the Selective Service act. The house passed the draft extension bill in August by the narrow margin of 203 to 202, with 182 Democrats and 21 Republicans recorded for the bill.

The wave of strikes in defense industries drew the fire of many Democrats, and created a demand for legislation to prevent work stoppages. On Dec. 3, the house passed a drastic defense strike bill, 252 to 136. Senate action was expected early in the 1942 session.

Many Democrats took the administration to task for its failure to take the lead in reducing nondefense expenditures, which amounted to approximately $6,500,000,000 in the budget for the fiscal year 1942. To explore possible economies, congress created a joint Congressional-Treasury Committee on Non-Essential Expenditures. Late in December this committee, whose chairman was Senator Harry Byrd of Virginia, submitted a report recommending a reduction of more than $1,000,000,000 in the nondefense budget, with cuts in agricultural aid, relief and public works appropriations.

In an exchange of telegrams with Representative Joseph W. Martin, Jr., head of the Republican National committee, Chairman Flynn, on Dec. 10, announced that the two political organizations had agreed to work together in the sale of defense bonds and stamps, in the recruiting of volunteer workers for civilian defense and in other war activities.

The arrangements for collaboration made by the two party leaders constituted the "most complete adjournment of domestic politics since the formation of the two-party system" the Democratic committee declared in a statement issued following the release of the telegrams.

On Dec. 21, Chairman Flynn announced the appointment of Edwin W. Pauley of Beverly Hills, Calif., as secretary of the Democratic national committee, to succeed Lawrence W. Robert, Jr., of Atlanta, Ga., who had resigned in Oct. 1940.

Responsibility for directing U.S. participation in World War II, as in World War I, rested with a democratic administration.

(O. McK.)

Denmark. A monarchy of north central Europe. Area, 16,575 sq.mi.; pop. (est. 1940) 3,844,312. Capital: Copenhagen (890,130). Other principal cities: Aarhus (99,881); Odense (85,521); Aalborg (55,652). Religion: Lutheran Christian. Ruler in 1941: King Christian X (*q.v.*); prime minister: Th. Stauning. On April 9, 1940 Denmark submitted to German military occupation.

History.—Denmark was in a better position than were most of the German-occupied countries in 1941; she had her king, her laws and no general destruction. King Christian still rode daily in the streets of Copenhagen, and he staunchly refused to sanction the introduction of Germany's racial laws. Yet Danish independence had been "modified" in many ways. Many Danes had been jailed for insulting or molesting the German soldiers who were "protecting" the country. Jewish co-operative society directors were ousted, and a nazi representative was put on each board. Because of the large proportion of business done by the co-operatives, this control was especially important. Danish agriculture was deprived of fodder and fertilizer, and was forced to sell livestock in return for German goods and credits.

Outside Denmark, some 244 of the nation's best ships escaped nazi capture. Most of these vessels, amounting by July 1941 to some 750,000 tons, were sailing directly or indirectly for Britain, flying the British "red duster" but with the Dannebrog at the foremast. Twelve new tankers had been of great use. On March 30, 1941, the United States took into "protective custody" 39 Danish ships, along with many German and Italian vessels. The United States Maritime commission soon took title to 15, and in July to 16 more, refitting them and putting them into service. Some 53 Danish ships were sunk by the Germans from the beginning of the war to July 1941; but so far as was known, none was sunk by the British. In Feb. 1941 news came via Stockholm that the Germans had requisitioned 10 naval torpedo boats from Denmark.

As ships disappeared, so also did the colonies which Germany could not reach—the Faeroes, Greenland and Iceland. On April 9, 1941, the United States signed an agreement with the Danish minister, Henrik de Kauffmann, assuming a practical protectorate over Greenland (*q.v.*). De Kauffmann was dismissed and Berlin stormed, but the minister was convinced he had acted for the best interests of his king and his people, and he stayed on in Washington. On July 7 the United States announced military occupation of Iceland (*q.v.*), but that action caused no legal change with respect to Denmark.

Danish resentment of the nazis showed itself mostly in a hostile correctness of attitude, and in refusal to associate with the Germans except in necessary business dealings. On Waldemar's day in June, R.A.F. flyers dropped leaflets encouraging patriotic hopes. A Danish council in London worked for the day of liberation, as did a group organized as "Free Denmark" in the United States. A unit of Danish soldiers fought with the British, and 5,000 seamen helped keep the life lines of the sea open.

Education.—In 1940 there were 407,355 students in the elementary schools and 67,064 in the middle and secondary schools. In the two Danish universities 6,474 students were enrolled. The entire budget of the ministry of education (including expenses for museums, libraries, etc.) provided 86,160,000 kr. for 1941–42.

Defense.—Budgets for purely military expenses were as follows: 1938–39, 33,635,000 kr.; 1939–40, 84,494,000 kr.; 1940–41, 62,663,000 kr.; 1941–42, (est.) 28,855,000 kr.

Finance.—The monetary unit is the kron (=20.346 U.S. cents in 1939). Government revenues in 1939–40 were 647,987,000 kr.; (est. 1940–41, 853,262,000 kr.); government expenditures in 1939–40 were 638,703,000 kr.; (est. 1940–41, 845,039,000 kr.). The national debt on Dec. 31, 1940, was 1,337,755,000 kr. Bank deposits were 1,541,200,000 kr. in 1939, and total bank funds were 3,362,000,000 kr.

Trade.—In 1940, exports amounted to 1,517,362,000 kr.; imports were valued at 1,376,836,000 kr. The chief articles of export were dairy products, eggs, poultry (485,498,000 kr.); meat and meat products (362,682,000 kr.); and live animals (chiefly for slaughter) (288,557,000 kr.; up spectacularly from 88,085,000 kr. in 1939, as the other chief items were about 15% down). Chief articles of import were coal, electricity, oil, etc.; foodstuffs, iron and steel, paper, grain and fertilizers. In 1939 exports went chiefly to the United Kingdom and Germany; imports were also supplied principally by these two countries. In 1940 and 1941 the overseas countries dropped out of Danish trade, but exact statistics by country were lacking.

Communication.—In 1940 there were 2,998 miles of railroads, carrying 64,244,000 passengers, and 9,056,497 tons of freight; 4,874 miles of improved and 20,870 miles of unimproved highways. By April 1, 1941, the number of automobiles had declined to about 32,000 and of motorcycles to 82. National airways carried 29,867 passengers in 1940. There were 390,065 subscribers to telephones in 1940–41, and 792,118 licensed radio listeners in March of that year.

Agriculture.—The area cultivated in 1940 was 8,045,000 acres. Leading crops and production (1939, in short tons) were as follows: barley (1,376,662); fodder (27,322,269); oats (1,114,315); potatoes (1,348,995). Livestock in June 1940 included the following: cattle, 3,279,300; pigs, 3,269,400; horses, 574,700; poultry, 33,296,200 (1939); sheep, 147,100.

Manufacturing.—The total value of production in 1939 was 3,719,329,000 kr. Chief manufactures were foodstuffs (1,002,363,000 kr.); transportation (ships, etc., 424,865,000 kr.); chemicals (368,509,000 kr.); wood and paper (264,170,000 kr.); clothing (230,994,000 kr.); metals (224,221,000 kr.); textiles (218,332,000 kr.). There were 178,425 employed workers in 6,320 establishments. The wholesale price index (based on 1935=100) rose rapidly from 118 in 1939 to a high of 207 in Aug. 1941.

(F. D. S.)

Dentistry. Figures released by government officials in 1941 showed that dental ailments headed a list of physical and mental defects leading to the rejection of men for military service. While 10% were turned down because of educational deficiencies, 20.9% or 188,000 cases, were rejected because of dental neglect.

Dental caries, the starting point of most of the dental ills, in the light of these figures again loomed large as a problem of major importance in public health. In the New England states there was improvement.

Reissner attacked the problem of dental caries from a systemic point of view and developed the organotherapeutic approach to its treatment.

Barrett approached the problem from an entirely new point of view: He related dental caries to the science of semantics. In his paper on "Semantogenesis and the Control of Dental Caries" his general thesis is that if dental caries and the management of the carious patient are approached from the standpoint of semantics, dental caries can be controlled.

One prominent theory regarding tooth decay is that it comes from the rapid growth and activity of the lacto bacillus in the mouth. The amount of activity has been determined, in part, by bacteriological counts. Marshall Snyder devised "a simple calorimetric method for the diagnosis of caries activity." He maintained that this simple calorimetric test, based on acid production in a selective carbohydrate medium (pH5.0) can be used as a means of diagnosing caries activity. In a group of 63 young people it was possible to select very accurately the caries active and caries negative cases, as established by clinical examination.

Fosdick and Starke, who have studied the matter of carbohydrate degradation by mouth organisms, felt that other factors entered into the problem besides the lacto bacillus, and made the statement that "On the basis of theoretical speculation, it is suggested that the presence of other organisms, in conjunction with yeast and the L. acidophilus, may augment the rate of decalcification of tooth enamel."

The role of calcium and phosphorus in developing sound tooth structure, and also maintaining it, has been a matter of considerable study. Becks and Furuta studied the effects of magnesium deficiency diets on oral and dental tissues and believed that "It can be generally concluded that magnesium is an essential mineral for enamel formation in rats, and that its lack represents another important factor to be considered in disturbances of enamel formation." Evidence has been accumulating for a number of years that the role of nutrition plays an important part in this whole matter of healthy dental structures and that deficiencies of various kinds are responsible for some of the dental disturbances. The dental effects experimentally produced by Howe, Bessey and White have been brought about chiefly by deficiencies in the organic elements calcium and phosphorus and the vitamins A, C and D. In vitamin C deficiency they found the bones and teeth markedly affected, and they outlined a desirable basis for daily food for the preschool child, through the adolescent period, for the adult and for pregnant women and nursing mothers. These authors believe that "In the mouth is the handwriting of individual physiologic activities. We can interpret comparatively little of what is written. Nevertheless, oral diagnosis has had a beginning, and little by little we are adding to our store of knowledge. The next step in dentistry is to open the portfolio of the facts relating systemic to oral states."

In May the president of the United States called the first National Nutrition Conference for Defense. In connection with this conference a subcommittee of the National Research council submitted a compilation of recommended allowances for special nutrients.

Dr. Lydia Roberts, a member of the Council on Foods and Nutrition, translated the daily food allowances, expressed in laboratory terms, as follows: "One pint of milk for an adult and more for a child; a serving of meat, and cheaper cuts are just as nutritious; one egg, or some suitable substitute such as navy beans; two vegetables, one of which should be green or yellow; two fruits, one of which should be rich in vitamin C, found abundantly in citrus fruits and tomatoes; breads, flour and cereal, most or preferably all whole grain or enriched; some butter or oleomargarine with vitamin A added; other foods to satisfy the appetite." A child or an adult on this regime should have protection against rampant dental caries.

With the lack of exact knowledge regarding the cause and cure of caries, one must be content with what is called control, and in areas like New York city and Hawaii where there are fine dental programs, the incidence of dental caries has been cut down in extraordinary percentages. Savage stated that "A remarkable degree of control of caries may be obtained by the practical application of certain broad principles which, somewhere between them, seem to contain the secrecy of its aetiology. These principles are, first, the consumption of a diet physiologically well balanced and accompanied by the reduction of its refined carbohydrate content, and, second, the cleansing of the teeth by natural or artificial methods." To this statement should be added that early attention, by the dentist, to breaks in the enamel surfaces, and the prompt filling of small cavities are also important parts of the control program.

The large amount of dental disease existing in the United States, as evidenced by the percentage of rejections for dental defects, has been claimed to be due in part to economic reasons—the inability of large groups of people to pay for the right kind of food and inability to pay for dental service. The economics committee of the American Dental association published in 1941 "A Study of the Dental Needs of Adults in the United States." This was a complete study of the whole problem. The average cost of dental care, based on the application of the fee schedule of the United States veterans administration to the average dental needs, was found to be $48.96 for males 15 years of age and over, and $45.43 for females in the same age range. Analysis of the effects of regularity in visiting the dentist, based in this study on the length of time elapsing since last visiting the dentist, revealed a definite relationship between length of time and the average dental need. The report stated, "This study positively demonstrates that with adequate dental care, including both daily dental hygiene and regular visits to the dentist, the dental health of the nation can be raised to a much higher level. Improvement of dental health on a national scale can and must be brought about by a vigorous and continuous program for dental care and dental education."

A book published in 1941 by Saunders, *Dental Education in the United States* by John T. O'Rourke and Leroy M. S. Miner, brings together in one volume the historical background of modern dental education, its aims and objectives and the needs for modification of the dental curriculum. The book also deals with some of the social aspects of dental service and its relation to dental education.

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Dentz, Henri (1881–), French army officer, was born Dec. 12 in Roanne, France. He entered St. Cyr military academy at the age of 19, completing the course as no. 1 man in his class, and became a lieutenant in a Zouave regiment. He graduated from the Ecole de Guerre in 1910 as a general staff officer. Cited three times in World War I, he was promoted to the rank of major and after the armistice, he served in occupation posts in Mainz, Germany, and at Constantinople (Istanbul). He was then sent to Syria, where he won recognition for his services as the head of the intelligence department. He was made a colonel in 1927, promoted to brigadier general in 1934, and was given command of an army corps in 1939. In Dec. 1940, he was made high commissioner of Syria and Lebanon by the Vichy government and was placed under direct orders of General Maxime Weygand (*q.v.*). On June 8, 1941, British near east armies invaded Syria after Vichy had rejected British demands to oust axis agents there. General Dentz's French armies resisted the British drive, but they were cut off from supplies by the British fleet. Dentz's position soon became hopeless and he concluded an armistice July 12, 1941. Interned Aug. 8, 1941, by the British on a charge of violating the armistice agreement, he was released in Sept. 1941 in an exchange of prisoners.

Deposit Insurance Corporation, Federal: *see* FEDERAL DEPOSIT INSURANCE CORPORATION.

Dermatology. An outstanding contribution was made by Peck, Chargin and Sobotka showing that keratosis follicularis (Darier) is due to deficiency in vitamin A. Four patients, while on a normal vitamin A-containing diet, showed a decided decrease in the vitamin A content of the blood serum. The carotene content of the blood was normal. Vitamin A in doses of 200,000 U.S.P. units was given by mouth daily to three patients, and was followed by gradual disappearance of the eruption. There was a coincidental restoration of vitamin A content of blood serum to normal levels. The authors suggested that the disease was possibly a physiologic nevus with an hereditary weakness in vitamin A absorption or in conversion of provitamin A to vitamin A.

In a spectrographic study of patients with chronic disseminated neurodermatitis, MacCardle, Engman Jr. and Engman Sr. found a decided decrease in magnesium in every active lesion and in every area of unaffected skin. No reduction of magnesium was apparent in 13 other cutaneous diseases. The same authors made an extensive study of the histologic structure of the skin in 33 cases of chronic disseminated neurodermatitis and compared it with that of normal persons of similar age and patients with other cutaneous diseases. Although the structure could not be considered an anatomical entity, sections were easily distinguished from 13 examples of psoriasis and 8 of contact dermatitis.

In discussing the poison ivy plant and its oleoresin, Shelmire said that the three forms of rhus with three leaflets and white berries, when grown under similar conditions, indicate that poison ivy in North America is represented by a single polymorphic species, with certain variations according to habitat. The irritative properties of the fresh saps and the ether extracted oleoresin of the various so-called species of poison ivy and poison sumac are biologically identical.

Osborne, Jordan and Campbell, in a report of 100 cases, found nail lacquer to be the most common cause of dermatitis about the eyelids of women. They said it should be considered a possible cause of dermatitis of the face, neck, cheeks, ears, ear canals, shoulders, chest and lips. Less common sites were the thighs, arms, axilla, anogenital area and legs and the general surface of the body. The eruption was usually of a patchy erythematosquamous type. Patch tests were found to be of doubtful value.

Histologic studies of the uninvolved skin in psoriasis were reported by Madden. Three hundred biopsies from 77 patients were studied. Characteristic changes of psoriasis were found in uninvolved skin at sites of election for psoriasis. This indicated that the skin as a whole took part in the disease. Typical histologic changes were also found in a pigmented residue of a lesion which had been healed for more than three months. The author thought that this might account for the necessity at times of treating psoriasis long after clinical lesions had disappeared.

Balanitis xerotica obliterans, a disease little known in the United States, was discussed by Freeman and Laymon on a basis of a study of 18 cases. They concluded that it may occur at any age in adults and that its development does not depend on previous operations on the genitalia. The authors concluded that the disease was identical with kraurosis penis and that it was at least closely allied to lichen sclerosus et atrophicus.

Jamieson and McCrea studied reinfection of ringworm of the feet from shoes and slippers. Positive cultures of scrapings from shoes of persons with ringworm of the feet showed that footwear may harbour pathogenic fungi and cause reinfection in many persons and primary infection in others. (*See* also INDUSTRIAL HYGIENE; MEDICINE.) (H. FX.)

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Detroit. Fourth largest city of the U.S.A., in Wayne county, southeastern Michigan, on the Detroit river; the metropolis of the state. Area, 137·9 sq.mi.; population (1940), 1,623,452. Foreign-born, about 400,000. Canadian and British predominated, greatly exceeding in numbers the Polish group, which was second in size. Assessed value, $2,525,250,760; gross bonded debt as of Dec. 31, 1941, $354,068,239, which included $96,325,739 of self-supporting utility debt; gross city appropriation, $143,223,158, including utilities; tax levy, $68,977,224; tax rate for city and school purposes, $27.32. Mayor (Jan. 1, 1942), Edward J. Jeffries, Jr.

A highly industrialized city, Detroit was keenly affected by the curtailment of automobile production and the speed-up of defense activities in 1941. The forepart of the year was characterized by a "boom" in automobile manufacturing, pay increases and shortage of housing facilities. The complete elimination of automobile production for private purposes was in part offset by new defense industries and some manufacturing for the war department, but during the period of transition to complete war production the city suffered substantial unemployment.

The initial upsurge in industry was disturbed by numerous minor unauthorized strikes and by a major strike in the Ford plant. The company had refused to enter into any contract with the C.I.O. but eventually reversed its position completely and granted the union shop and "check-off."

Other important labour difficulties developed in the city government which culminated in a brief jurisdictional strike in the municipally owned street railways. Following an election, the A.F. of L. union was in substance granted a contract and sole bargaining rights. Threatened strikes among other municipal employees were cancelled as a result of the declaration of war, but demands for wage increases continued.

The local governments, both city and county, provided major political scandals during the year. As the result of revelations incident to a minor police case, a grand jury brought graft indictments against a former mayor, and then the incumbent prosecutor, sheriff and numerous police officials. The three former were convicted with 22 police officers. The jury then turned its attention to the city council, and three councilmen were convicted of bribery in connection with federal housing projects.

In spite of public indignation at graft charges and convictions, the city government, under a new executive, operated effectively. The refunding of the public debt, with substantial savings in interest, continued, budget limitations were observed and the deficit was reduced. (L. D. U.)

Devaney, John Patrick (1883–1941), U.S. jurist, was born June 30 in Lake Mills, Ia. One-time leader in the Democratic party in Minnesota, Devaney was a friend and political adviser of the late Floyd B. Olson, Farmer-Laborite governor from 1931 to 1936. Devaney was chief justice of the Minnesota supreme court, 1933–37, and was chairman of the Minnesota Crime commission, 1934-41. In 1940, he was appointed by President Roosevelt to the Emergency Board in Settlement of Labor Disputes. Devaney died in Milwaukee, Sept. 21.

Diabetes. Diabetes ranked eighth as a cause of death in the United States in 1940, 35,015 cases, 26·6 per 100,000, the highest mortality yet attained. Under the age of 25 there were 975 deaths and 805 above the age of 85. Most of the deaths occurred between the ages of 65 and 69, which is five years less than the peak period for all deaths. In New York city the rate was 41·6. Diabetic coma, once the leading cause of death in diabetes, dropped to 3·6% of 929 fatal cases in one clinic which also reported no deaths in the treatment of 43 successive instances of actual coma.

The use of insulin has increased yearly since 1923. The addition of protamine in 1936 doubled the duration of its action to 12 or 14 hr and the subsequent insertion of zinc lengthened its effect to between 24 and 48 hr., which quite likely accounts for the recent prolongation of life of diabetics. Although protamine zinc insulin is satisfactory alone for one-half of all diabetics, its initial slowness of action and delay in lowering the blood sugar make it advisable to supplement it with the original regular or the similar but purer crystalline insulin, which act immediately. To obviate two injections, several new insulins were devised which combine the properties of regular and protamine zinc insulin. They did not, however, up to the close of 1941, appear to be enough superior to the older insulins to warrant cumbering druggists' shelves and confusing patients' minds with their distribution. Two of these newer insulins are histone zinc insulin and globin zinc insulin. They act promptly and for about 24 hours. Histone is obtained from the thymus gland and globin from the red blood corpuscles.

The demonstration by the Toronto school that the experimental diabetes caused by the injection of an extract of the anterior pituitary gland into a dog can be prevented by the simultaneous injection of insulin or dietary modifications and by the Philadelphia investigators that the diabetes similarly produced in a cat can be similarly cured even after it has continued five months stimulated aggressive clinical attempts to prevent and cure human diabetes or at least halt its progress. Prevention was not proved and cures were not reported up to Jan. 1, 1942, but clinicians were constantly confronted with near-cures. These remarkable experiments with animals provoked a renaissance of orthodox diabetic therapy.

Monographs, manuals, state and city publications upon the disease appeared in growing numbers. An insurance company concentrated upon diabetes in its health advertising propaganda. Children's diabetic summer camps numbered 20 or more. The American Diabetes association, a counterpart of the English Diabetic association, was incorporated in 1941.

Experiments discredited concepts of the relation of fat metabolism to acidosis (ketogenesis). Hurtley's hypothesis of multiple alternate oxidation of the fatty acid chain replaced Knoop's theory of successive beta oxidation. These new concepts, together with related evidence in the literature, were admirably summarized by Stadie. "The diabetic who by reason of insulin lack is unable to utilize carbohydrates to the full measure of his metabolic needs must fall back on fat for his energy requirements. Part of this need is met by the initiation and completion of fat oxidation in the muscles themselves. However, a considerable fraction estimated as one-third to one-half of the total caloric needs from fat is obtained by a preliminary oxidation of fats in the liver to ketone bodies only. Neither acetic acid nor glucose is formed by this oxidation. These hepatic ketone bodies are freely utilized for energy by the periphery without insulin and without the necessity of simultaneous carbohydrate oxidation. This reserve mechanism, however, appears to be incapable of fine regulation so that when the demand for fat calories exceeds a certain level, approximately 2·5 gm. of fat/kg./day for the resting state,

ketone bodies in excess of needs are formed by the liver. The excess is excreted as ketones in the urine. If this excessive fat catabolism continues unchecked, ketosis and coma follow."

Lack of insulin is the primary but not the only hormonal abnormality in diabetes. In childhood one sees evidence of a complex disorder in the deviations of growth and development. Their acceleration characterizes juvenile diabetes at onset whereas retardation may characterize the disease when of long duration. These abnormalities are susceptible to appropriate endocrine therapy.

Another example is the abnormal hormonal pattern found in half the patients when pregnancy complicates diabetes. Progestin failure early in pregnancy is associated with spontaneous abortion, which destroys 20% of the foetuses. Progestin-oestrin failure with rise of chorionic-gonadotropin and probably other hormonal disturbances are associated with premature deliveries, toxaemia, stillbirth, and neonatal deaths. These accidents bring the deaths up to 50%.

Continuous progestin therapy apparently prevents the foetal wastage early in pregnancy.

Continuous oestrin and progestin substitutional therapy, when indicated, according to some authors, corrects the foetal wastage in the later part of pregnancy so that the diabetic foetal mortality is not more than 10% compared with 5% for nondiabetics.

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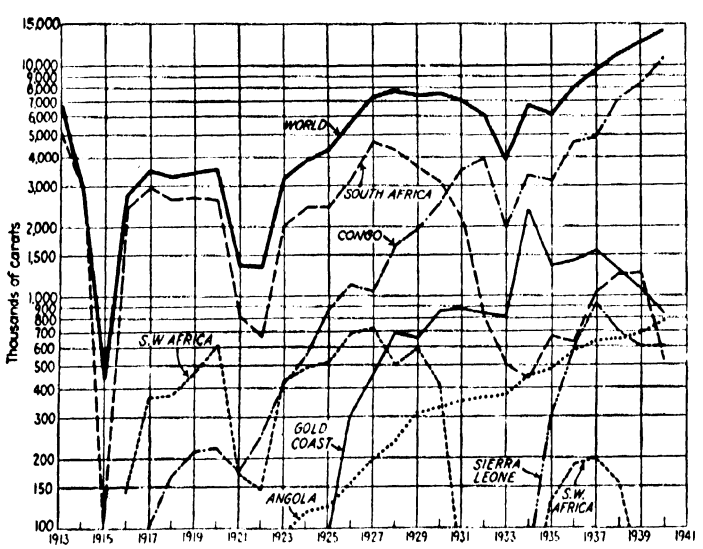
Diamonds. World production of diamonds during recent years is shown in an accompanying chart. Few actual figures were reported for 1940, and the estimates used in the chart are those of S. H. Ball, in *Minerals Yearbook*.

The main feature of the year was the large increase in output from the Belgian Congo, which produced three-quarters of the 1940 output on a weight basis, though much less on a value basis, as the larger portion of the Congo stones are of industrial grade.

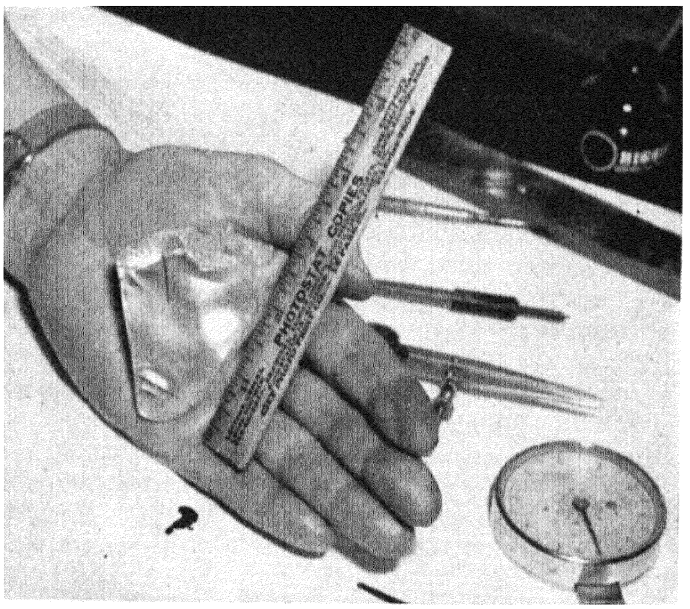
Production in South Africa and South-West Africa is predominantly gem stones, and for this reason work has been curtailed; in South Africa mine operation was discontinued in Sept. 1940, but alluvial work there and in South-West Africa was continued on a reduced scale.

In other areas, especially where industrial stones predominate, production is being pushed.

During World War I diamonds were considered primarily a luxury product and output was greatly restricted, but in World War II the larger portion of the output by weight, though not by value, was a highly important industrial raw material, especially useful in munitions manufacture and automotive work, and demand increased accordingly.



DIAMOND PRODUCTION OF THE WORLD and the major producing countries *(The Mineral Industry)*



THE PRESIDENTE VARGAS DIAMOND, third largest ever discovered, as it appeared before cutting operations began in New York city April 9, 1941, after a year of study by diamond experts

With the German occupation of Belgium and the Netherlands, the two chief diamond cutting centres of the world, Antwerp and Amsterdam, fell into German hands, but most of the accumulated stocks of cut and rough stones had previously been removed to safety in England or the United States. For a time the cutting industry was in a state of collapse, but later it was reorganized under German control, and was operating on a reduced scale, since there was no adequate supply of rough stones available except from British territory.

Imports of diamonds into the United States increased in 1940, but the character of the imports changed radically from that of preceding years.

Cut stones have been less available since the European cutting industry collapsed, and more rough was imported, to be cut in the establishments already in operation, and in new ones that were being started by refugees from cutting centres of Europe.

Imports of rough stones increased 48% over 1939 to 227,900 carats, while cut stones dropped 34% to 321,500 carats. Imports of industrial stones were already exceptionally heavy in 1939, and increased only 7% to 3,810,900 carats. Imports increased still more in 1941, the total for the first eight months being 2,647,400 carats, or at a rate of 3,971,100 carats for the year, although the rates for both rough and cut stones decreased. (G. A. Ro.)

Diatomite. World production of diatomite is estimated to be of the order of 300,000 long tons, of which the United States contributes somewhat more than one-third.

The output of Denmark has been almost as large as that of the United States, and the remaining third of the total has been furnished by a long list of small producers, of which only Japan, Algeria, France and probably Germany have outputs in excess of 10,000 tons. (G. A. Ro.)

Dictatorships: *see* COMMUNISM; FASCISM; GERMANY; ITALY; JAPAN; RUMANIA; SPAIN; UNION OF SOVIET SOCIALIST REPUBLICS.

Dies Investigating Committee: *see* CIVIL LIBERTIES; GERMAN-AMERICAN BUND.

Dietetics. Nutrition trends indicated official interest in nutrition in many countries, whether it was the daily ration of less than 1,250 calories in France, the committee to supervise the provision of the country with vitamins in Sweden, the establishment of a department of nutrition in Mendoza, Argentina, the organization of a national program for adequate nutrition in Britain, or the recommended dietary allowances of the National Research council of the United States.

Research continued on many phases of the nutrition problem. Some new techniques increased understanding of vitamin A. Through fluorescent microscopy Popper found it in human tissues, tracing its absorption and path in the body.

While chiefly concentrated in the liver, significant amounts are found in other organs, even in the body fat of well nourished adults. Dark adaptation studies showed marked differences between English and French school children in Quebec, as reported by Goss.

Other eye defects responding to vitamin A, observed by Kruse, were Bitots spots, conjunctival changes, photophobia, lachrymation. Sandels found follicular conjunctivitis in groups of Florida school children to be their expression of vitamin A deficiency.

Since whole grain cereals and dried beans are rich sources of thiamin, evidence of its retention in cooking is welcome.

A maximum of 9% was destroyed when cereal was boiled five minutes over a direct flame followed by one hour in the double boiler. Somewhat less vitamin B_1 was found in baked than in boiled beans.

In spite of the discovery of the food deficiency responsible, pellagra continued to develop due to ignorance usually reinforced by the deprivations of poverty or war. Sydenstricker emphasized the aetiologic effect of high carbohydrate diets, reduced availability of nicotinic acid in the absence of gastric acid, and of failure of liver function under conditions of metabolic strain.

Ocular manifestations of human riboflavin deficiency reported in the United States were confirmed by Hou in China. Hou observed and treated 40 cases in three months, and while some cases also had cheilosis, the two sets of symptoms were not always found in the same patient.

Dietary "Pattern" to Meet the Recommended Allowances

Milk, adults 1 pt., children 1½ pt. to 1 qt.
Egg, 3 or 4 times per week.
Meat, 1 serving (1 oz. at 1 yr. up to 3 oz. for adults).
Vegetables, 2 servings. One green or yellow.
Fruit, 2 servings. One citrus or tomato and one other, as apple, prunes, etc.
Potato, one or more servings.
Butter or fortified oleo (100–500 calories).
Whole grain or "enriched" cereal and bread, at least half of the intake.
Sugar, fat, etc., to complete calories.

It was generally agreed that humans require pyridoxin (B_6). Its low toxicity facilitates its continued experimental use. Animal products, especially muscle meat, are usually good sources of this vitamin. Wheat germ is an equally rich plant source.

As the result of analysis, Sweany reported that humans saturated with vitamin C contain 5 mg. per 100 g. or 3–5 g. total. Active, severe tuberculosis cases contained less than 10% of this. Aged persons also usually had a low reserve. (*See* also VITAMINS.)

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Dimension Stone: *see* STONE.

Dinsmore, Charles Allen (1860–1941), U.S. educator and clergyman, was born Aug. 4 in New York city. He graduated from Dartmouth college in 1884 and received a D.D. degree from Dartmouth in 1905 and a similar degree from Yale in 1916. In 1888 he was ordained in the Congregational Church and thereafter served in a number of New England pastorates.

In 1920 Dr. Dinsmore became lecturer on the spiritual content of literature at Yale Divinity school with the rank of professor. He was the author of biographical and critical works on Dante, among which were *The Teachings of Dante* (1901), *Aid to the Study of Dante* (1903) and *Life of Dante* (1919). In later years he wrote *The English Bible as Literature* (1931) and *The Great Poets and the Meaning of Life* (1937). Dr. Dinsmore died at New Haven, Conn., Aug. 14.

Recommended Daily Allowances for Specific Nutrients*

	Calories	Protein, grams	Calcium, grams	Iron, mg.	Vitamin A,‡ I.U.	Thiamin (B_1), mg.†	Riboflavin, mg.	Nicotinic acid, mg.	Ascorbic acid, mg.†	Vitamin D, I.U.
Man (70 kg.)										
Moderately active	3000	70	0.8	12	5000	1.8	2.7	18	75	¶
Very active	4500	..	..	..	..	2.3	3.3	23	..	..
Sedentary	2500	..	..	..	..	1.5	2.2	15	..	..
Woman (56 kg.)										
Moderately active	2500	60	0.8	12	5000	1.5	2.2	15	70	¶
Very active	3000	..	..	..	..	1.8	2.7	18	..	..
Sedentary	2100	..	..	..	..	1.2	1.8	12	..	..
Pregnancy (latter half)	2500	85	1.5	15	6000	1.8	2.5	18	100	400–800
Lactation	3000	100	2.0	15	8000	2.3	3.0	23	150	400–800
Children up to 12 years:										
Under 1 year §	100 kg.	3–4 kg.	1.0	6	1500	0.4	0.6	4	30	400–800
1– 3 years **	1200	40	1.0	7	2000	0.6	0.9	6	35	¶
4– 6 years	1600	50	1.0	8	2500	0.8	1.2	8	50	..
7– 9 years	2000	60	1.0	10	3500	1.0	1.5	10	60	..
10–12 years	2500	70	1.0	12	4500	1.2	1.8	12	75	..
Children over 12 years:										
Girls, 13–15 years	2800	80	1.3	15	5000	1.4	2.0	14	80	¶
16–20 years	2400	75	1.0	15	5000	1.2	1.8	12	80	..
Boys, 13–15 years	3200	85	1.4	15	5000	1.6	2.4	16	90	¶
16–20 years	3800	100	1.4	15	6000	2.0	3.0	20	100	..

Source: Committee on Foods and Nutrition, National Research Council.
*Tentative goal toward which to aim in planning practical dietaries; can be met by a good diet of natural foods. Such a diet will also provide other minerals and vitamins, the requirements for which are less well known.
**Allowances are based on needs for the middle year in each group (as 2, 5, 8, etc.), and for moderate activity.
†1 mg. thiamin equals 333 I.U.; 1 mg. ascorbic acid equals 20 I.U.
‡Requirements may be less if provided as vitamin A; greater if provided chiefly as the provitamin carotene.
§Needs of infants increase from month to month. The amounts given are for approximately 6–8 months. The amounts of protein and calcium needed are less if derived from breast milk.
¶Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimum amounts recommended for infants.

Diplomatic Services: *see* AMBASSADORS AND ENVOYS.

Disasters.

During 1941 loss of life and property in accidents and disasters included the following:

Aviation

Jan. 4 — Near San Diego, Calif. Entire crew of 11 in navy transport plane killed in crash on Mother Grundy peak; victims included 4 men who had parachuted from another navy plane in distress Jan. 2.

Jan. 16(?) — Near Morton, Wash. Army bomber crashed into hillside; 7 killed.

Jan. 23 — St. Louis, Mo. Airliner crashed near municipal airport; pilot and another killed; 12 injured.

Feb. 6 — Kwangtung province, China. Admiral Osumi and 6 other Japanese naval officers killed when their plane crashed on Huanyangshan mountain near the Si-kiang river.

Feb. 6 — Near Lovelock, Nev. U.S. army bomber smashed into Ragged Top mountain, killing crew of 8.

Feb. 6 — Near Armstrong, Ont. Nine passengers and crew of 3 killed when Canadian passenger plane crashed a mile from Armstrong airport.

Feb. 22 — Near Musgrave Harbor, Newfoundland. Sir Frederick Grant Banting, co-discoverer of insulin, and 2 other men killed when plane crashed in snow wastes; pilot survived crash.

Feb. 27 — Near Atlanta, Ga. Seven killed, 9 injured in crash of passenger airliner; Capt. Eddie Rickenbacker was injured.

March 17 — Pacific ocean. Six U.S. navy fliers killed when 2 planes manoeuvring in Pacific area crashed in mid-air.

March 28 — Cape province, Union of South Africa. Plane crash killed 10, including British admiral.

April 8 — Machipongo inlet, near Virginia coast. U.S. navy patrol bomber crashed and sank; 10 aboard killed.

April 16 — Near San Diego, Calif. Three navy fliers killed when torpedo bomber crashed into sea.

May 16 — Near Nelsonville, Ohio. Five occupants of a twin-motored army bomber were killed when the plane crashed during a storm.

May 19 — Rains, S.C. Four army fliers were killed when 2 army bombers collided in mid-air.

June 2 — San Diego bay, Calif. Four U.S. airmen were killed when a 4-motored bomber crashed into San Diego bay.

June 10 — Near Lyman, Wyo. U.S. army bomber, missing for 4 days, found wrecked on plain; 6 army pilots were killed.

June 11 — El Valle mountains, near Balboa, Canal Zone. U.S. army bomber crashed 70 mi. southwest of Panama City, killing 4 occupants.

June 24 — Mount Haleakala, Maui island, Hawaii. Three U.S. Marine fliers killed when their plane crashed on a mountain slope.

June 25 — Near Lima, Peru. U.S. bomber crashed into the Pacific, killing 3 occupants.

July 24 — Cardington, Ohio. U.S. army bomber destined for shipment to Britain crashed, killing both the pilot and co-pilot.

Aug. 1 — Near Fort Ord, Calif. Three army pilots were killed when 2 military planes locked wings in mid air.

Aug. 14 — England. Twenty-two were killed, among them 11 American ferry pilots, when a ferry plane crashed at an unnamed airport; Arthur B. Purvis, chairman of the British supply council in North America, was among the dead.

Aug. 18 — Near São Paulo, Brazil. Eight were killed and 5 were injured when a Brazilian transport plane crashed on a mountain peak near São Paulo.

Aug. 19 — Florida. Seven naval aviators based at various training schools in Florida were killed in a series of 4 separate plane wrecks over a 24-hour period.

Aug. 29 — Near March field, Calif. Four army pilots were killed when 2 army planes locked wings in a practice flight.

Sept. 1 — United Kingdom. Ten were killed when a transatlantic ferry transport plane crashed on the west coast.

Sept. 2 — Hempstead, L.I. Three children were killed when a plane that caught fire in mid-air plummeted into their midst. The pilot who bailed out suffered slight burns.

Oct. 2 — Near Flagstaff, Ariz. All 6 occupants of an army bomber killed when plane crashed into Mt. Agassiz.

Oct. 12 — Near Beaumont, Calif. Five army men killed when bomber crashed during rainstorm in San Gorgonio pass.

Oct. 13 — Batavia, Netherlands Indies. Lt. Gen. Berenschot, commander of Dutch East Indies army, and 11 others killed in a plane crash.

Oct. 21 — Near Balboa, Canal Zone. Three U.S. air force officers, each piloting a plane in a squadron flight, were killed when their planes crashed into a mountain.

Oct. 24 — Near Hamilton field, Calif. Five army pilots died when their twin-motored bomber crashed on mountain peak.

Oct. 28 — Near Vaughn, N.M. Five army fliers killed when their trainer plane crashed.

Oct. 30 — St. Thomas, Ont., Can. New York-Chicago airliner crashed in flames, killing all 20 occupants.

Oct. 30 — Near Fargo, N.D. Fourteen died when airliner crashed in a fog near Fargo airport; pilot was only survivor.

Nov. 1 — Near Findlay, Ohio. Five killed when army bomber crashed into a cornfield.

Nov. 3 — Atlantic ocean. All 12 occupants of a U.S. navy bomber killed when plane crashed in Atlantic while on patrol duty.

Nov. 12 — Near Nimes, France. Gen. Charles Huntziger and 7 others returning from North Africa killed when their plane crashed.

Dec. 13 — Balboa, Canal Zone. Five killed and 10 injured when army bomber crashed into barracks.

Fires and Explosions

Jan. 14 — Brooklyn, N.Y. Six men killed, 10 injured, in fire which destroyed box factory.

Feb. 4 — New Haven, Conn. Fire destroyed plant making army blankets; 10 workers killed, 3 injured.

Feb. 8 — Dallas, Tex. Ten homeless transients killed when flames destroyed Salvation Army refuge.

Feb. 11 — Chicago, Ill. Giant pressure drum exploded in chemical plant near "Loop," killing 3 employees and injuring 6.

Feb. 14 — Near Du Quoin, Ill. Seven men were killed in blast at liquid oxygen plant of coal mine.

March 10 — Brockton, Mass. Twelve firemen killed in collapse of roof of burning theatre.

March 14 — Seville, Spain. Fifteen killed, 300 injured and 3,000 left homeless when powder plant blew up.

April 11 — Belvidere, N.J. Powder plant blast killed 2, injured 3.

April 20 — Eastern U.S. Forest fires swept over drought-stricken areas in N.Y., N.J., Md., Mass., W.Va., and Pa., destroying many homes and woodlands.

May 15 — Philadelphia, Pa. A $2,000,000 blaze destroyed a lumberyard damaged a shipyard building and razed a number of dwellings; 2 were killed.

May 23 — Sewaren, N.J. Explosion of a gasoline tank in an oil plant caused the death of 5 workmen.

May 31 — Jersey City, N.J. Waterfront fire destroyed $25,000,000 in defense materials and razed grain elevators and nearby stockyards.

June 5–6 — Smederevo, Yugoslavia. At least 1,500 persons were killed and 2,000 seriously injured when an ammunition dump exploded in the Smederevo fort, near Belgrade, a Berne dispatch said.

June 30 — Near Indiana, Pa. Blast in coal pit killed 6 miners and injured 21 others.

Aug. 10 — Near Doylestown, Pa. Five children perished in a blaze that destroyed an ancient highway tollhouse in which they lived with their parents.

Aug. 14 — Japonski island, Alaska. Five were killed in an avalanche of rock loosened by blasting at a construction camp.

Aug. 18 — Brooklyn, N.Y. A fire that started on a Brooklyn pier and wrecked the freighter "Panuco" took a toll of 31 dead.

Aug. 18 — Near Grange, Pa. Six children died in a blaze that destroyed the home of a WPA worker.

Sept. 24 — Whiting, Ind. Fire which started in naphtha plant of large refinery destroyed several buildings and tanks; one person was killed and five were injured.

Oct. 11–12 — Fall River, Mass. A 14 hr. fire swept through 4 buildings of large rubber plant, causing damage estimated at $12,000,000; no deaths were reported.

Oct. 12 — Sitka, Alaska. Six U.S. soldiers killed by blast in underground dynamite magazine at Sitka naval air base.

Oct. 27 — Nortonville, Ky. Fifteen men trapped in a coal mine explosion were found dead.

Oct. 28 — Montclair, N.J. Twelve Negroes were burned to death when fire swept through a flimsy house.

Oct. 31 — Huddersfield, Yorkshire, England. Forty one died in fire at clothing factory.

Oct. 31 — Nordegg, Alberta, Can. Twenty-seven miners were killed by a blast in a colliery

Nov. 24 — Seward, Alaska. Fire destroyed half of Seward's business district and left 400 persons homeless, damage estimated at $1,000,000.

Dec. 12 — Burlington, Iowa. Nine workmen killed and 20 injured in blast which destroyed TNT melting unit in ordnance plant.

Dec. 16 — Schenectady, N.Y. Eight aged persons burned to death in convalescent home.

Dec. 28 — Harco, Ill. Seven men were killed in coal mine blast.

Marine

Jan. 21 — Off Boston, Mass. Fishing boat sank in shallow water after collision near Boston harbour; 19 were drowned, most of them after clinging 3 hours to protruding mast.

March 25 — About 80 mi. south of Cape Lookout, N.C. Explosion followed by fire on 9,000-ton oil tanker, "Cities Service Denver," cost lives of 20 seamen.

March 26 — Off Halifax, Nova Scotia. Canadian navy patrol vessel destroyed by fire at sea; 19 seamen were drowned or died of exposure.

May 18 — Near Little River, S.C. Explosion aboard the excursion boat "Nightingale" killed 7 passengers and injured 14; the blast occurred as the boat was 12 mi. out.

June 20 — Near Portsmouth, N.H. U.S. navy submarine "O-9" failed to come up from a 402-ft. test dive; crew of 33 was lost.

June 20 — Near Bailey island, Me. Thirty-six died when a cabin cruiser exploded.

Sept. 17 — Near Stockholm, Sweden. Three Swedish destroyers were blown up in a mysterious blast in Haorsfjaerdens naval yard; 31 sailors were killed and 12 were injured.

Motor Traffic

Jan. 26 — Dalton, Ga. Six killed when their motor car was hit by train.

Aug. 10 — Near Waynesville, Mo. Eight Negro soldiers were killed and 6 were injured when army truck burst into flames following a crash with a civilian truck.

Aug. 24 — Near Waldwick, N.J. Eight were killed and 15 were injured when a bus crashed into a line of motor cars waiting at a traffic light.

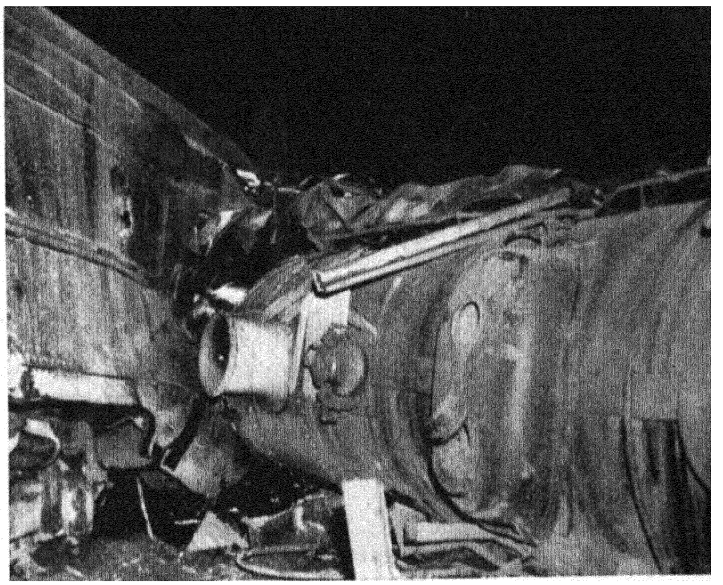
Sept. 13 — Highland, Ind. Seven in one family were killed when their car was struck by an express train.

Oct. 26 — Near Clanton, Ala. Fifteen were burned to death when a bus crashed into concrete bridge and burst into flames.

Nov. 15 — Near Rushville, Ind. Nine burned to death and 10 others injured when passenger bus plunged over a 25-ft. embankment and burst into flames.

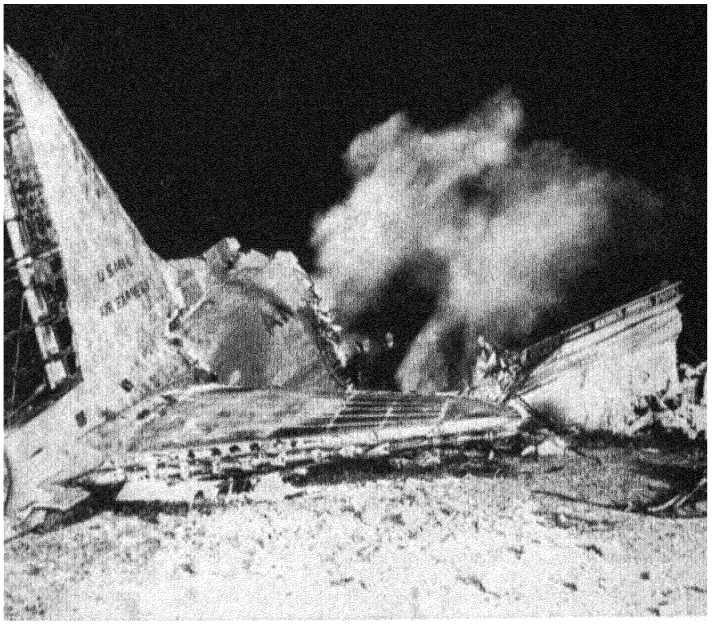
Dec. 5 — Americus, Ga. Head-on collision between school bus and automobile caused death of 7 and injuries to 12 others.

Dec. 25 — St. Louis, Mo. Ten died and 22 were injured when bus collided with automobile and caught fire.



Above, left: MORE THAN 1,000 FAMILIES of Salina, Kan., were homeless in Oct. 1941 when the flooded Smoky Hill river overflowed into the residential section of the city

Above, right: THE WORST U.S. TRAIN ACCIDENT of 1941 took the lives of 12 persons on the night of November 9, when a Chicago-New York express train struck a cylinder-head blown off the locomotive of a passing freight train and crashed into a signal tower at Dunkirk, Ohio. The picture shows the train's locomotive smashed into one of the coaches



Right: SMOULDERING WRECKAGE of a New York-Chicago airliner which cracked up at St. Thomas, Ont., Canada Oct. 30, 1941, killing all 20 persons aboard

Below: SPARKS CARRIED BY WIND from burning swampland set fire to 325 cottages in the Ocean Bluff section of Marshfield, Mass. April 21, 1941 and destroyed them within three hours

Motor Vehicle Accidents in U.S.A.—1941

Number of deaths (est.)	40,000
Number of deaths (1940)	34,501
Number of non-fatal injuries (est.)	1,400,000
Deaths per 100,000,000 vehicle miles	12.0

Natural Disasters

Feb. 16–18	Spain and Portugal. Violent hurricane lashed ports along Bay of Biscay and Atlantic coast, killing 145 persons and starting a fire in Santander which left 30,000 homeless.
Feb. 19	Yugoslavia. Floods in northern Bačka and Banat inundated 50,000 ac., ruined crops and left 1,000 peasants homeless.
March 1	Northern Greece. Earthquake rocked town of Larissa in Thessaly, leaving thousands homeless.
March 16	North Dakota and Minnesota. Blizzard, sweeping along at 85-m.p.h. pace, killed approximately 60 persons.
April 15	Colima, Mexico. Earthquake followed by tidal wave and eruption of Colima volcano brought death to at least 174 persons, injured 175 and caused heavy damage.
May 25	Ganges delta, India. Five thousand persons were reported drowned in a storm that struck a number of villages in the Barisal district.
June 5	Pennsylvania. Heavy floods in western Pennsylvania caused the death of 4.
June 8	Near Wichita, Kan. Tornado killed 8 on farms north of Wichita.
June 27	Luzon island, Philippines. At least 5 were killed in a typhoon.
July 22	Ashikaga, Shizuoka prefecture, Japan. A typhoon following a week of heavy rains caused the death of 35 persons and left 26,000 homeless in the region.
Sept. 22–24	Texas Gulf coast. Hurricane gales killed at least 3 and caused damage estimated in millions.
Oct. 6	Kansas City, Kan. Three were killed and 40 injured by tornado.
Oct. 7	Southeastern U.S. Tropical storm swept through Florida gulf coast and Georgia, causing 9 deaths and heavy destruction.
Oct. 26	Arkansas. Two tornadoes, 6 hours apart, killed 17 and injured scores more.
Dec. 13	Huaras, Peru. Landslide wiped out entire residential section; more than 500 died.

Railroads

March 16	Near Baden, Pa. Passenger train plunged into Ohio river, killing 5 and injuring 50.
March 18	Windham, Ohio. Freight train crashed into passenger train carrying 700 construction workers to jobs in arsenal, injuring 300.
April 28	Near Claypole, England. Six boys, including the 2 sons of former Belgian Premier Hubert Pierlot, were burned to death when trapped in a blazing railroad coach.
Sept. 23	Wichtrach, Switzerland. An express train plowed through waiting local train, killing at least 15 and injuring 50.
Oct. 7	Sault Ste. Marie, Mich. A lift bridge over St. Mary's Falls canal collapsed under weight of a freight train, blocking transit of ships carrying ore needed for defense; 2 trainmen drowned when the train plunged into the canal.
Nov. 2	Paris, France. Twenty killed and 48 injured when a passenger train and freight train crashed at entrance of Austerlitz station.
Nov. 9	Near Dunkirk, Ohio. Twelve were killed and 40 others injured when a Chicago-New York express jumped the rails and plowed into a control tower.
Nov. 19	Van Nuys, Calif. Locomotive burst into flames in Hasson tunnel; engineer, fireman and 3 other trainmen killed.

Miscellaneous

Aug. 5	Near Yuma, Ariz. Seven in a party of 9 died of heat and thirst when their motor car stalled on the Sondra desert road.
Dec. 4	Hartford, Conn. Collapse of span across Connecticut river at Hartford killed 8 workmen; 6 others were missing.

(*See* also ACCIDENTS.)

Disciples of Christ, a religious body having its chief strength in the United States and Canada, which received its initial impulse in 1809, dates its separate existence from 1830, and its nationally organized work from 1849. It is also well represented in Great Britain, Australia and many mission fields. Local churches are generally known as Christian churches or as Churches of Christ. The familiar designation, "Campbellite," derived from the name of the earliest leaders, Thomas and Alexander Campbell, is resented. The headquarters of the United Christian Missionary society and other promotional and educational agencies are at Indianapolis, Ind. The National Benevolent association has headquarters at St. Louis, Mo. The annual international convention (United States and Canada), usually held in October, met in May 1941, at St. Louis (H. B. McCormick, president). The 1942 convention is scheduled to meet Aug. 12 at Oakland, Calif. A North American convention, a mass assembly not related to the organized missionary agencies, has been held annually in recent years. Disciples of Christ co-operate in all interdenominational activities, are members of the federal council and are participating in the formation of the World Council of Churches. World membership, as of June 30, 1941, was 1,834,562 (gain for the year, 5,097); churches, 8,886 (loss 38). In the United States and Canada there were 1,671,966 members (gain 2,744); 8,012 churches (loss 58); ministers 7,580 (gain 79). Receipts of national and state missionary, benevolent and educational agencies reporting to the international convention were $4,259,026 (gain $214,376). Receipts for local church maintenance, $11,839,565 (gain $774,285). There were many independent missionary agencies not reporting.

(W. E. GA.)

District of Columbia: *see* WASHINGTON, D.C.

Divorce: *see* MARRIAGE AND DIVORCE.

Dog Racing. The sport of dog racing in the United States developed into a vast industry, embracing about forty race tracks, with an annual turnover of nearly $100,000,000. The big business aspect of the sleek greyhounds centred largely in two of twelve states, Massachusetts and Florida; in the former eight tracks account for nearly $10,000,000 a year in parimutuel play, and in the Miami area four tracks claim over $8,000,000. In Miami about 500 owners and trainers cared for 2,000 fleet-footed canines with a collective value of more than $1,000,000. The dogs were valued at from $50 to $1,000, some of the champions worth as much as $5,000. (J. B. P.)

Dog Shows: *see* SHOWS: *Dogs.*

Dominica: *see* WEST INDIES, BRITISH.

Dominican Republic, a West Indian republic occupying the eastern two-thirds of the island of Hispaniola. Area, 19,326 sq.mi.; pop. (1935 census) 1,479,417. Aside from 73,070 aliens, there were 13% white, 71% "mixed," 16% Negroes. Official estimate of population in 1940 was 1,656,219. Chief cities (1935 pop.): Ciudad Trujillo, the capital, formerly Santo Domingo, oldest European-founded city in America, (71,091); Santiago de los Caballeros (34,175); San Pedro de Macoris (18,617). The population, fourth densest in Latin America, was nearly five-sixths (82.2%) rural. President in 1941: Dr. Manuel de Jesús Troncoso de la Concha.

History.—Important in Dominican history during 1941 was conclusion of a treaty with the United States abrogating the latter's right to supervise Dominican customs (in effect since 1905). On April 1, the Dominican government formally took over the collection of customs. Further evidence of cordial relations with the United States was given in December by declarations of war against all the axis powers. The authorization, in March, of a $300,000 loan from the U.S. Export-Import bank, supplementing a $3,000,000 credit of Dec. 1940, and continued activities aiming at establishing a rubber industry in the Dominican Republic, were other signs of close co-operation with the U.S.

Development of European refugee settlements was advanced when ex-President Trujillo gave another 50,000 acres of land to the settlers, largely German Jews, at Sosua. Other colonies did not fare so well, however, as did Sosua. Of eight established for Spanish republican refugees, five failed and the other three were in a serious state because of a lack of funds.

Concurrent with announcement of a project to revise the Dominican constitution to provide a six-year term for the president, it was freely predicted that ex-President Trujillo would be a candidate in the May 1942 presidential elections.

Education.—In 1939, there were 848 primary, 11 secondary, 46 vocational and 17 adult night schools (enrolment 115,703).

Finance.—The monetary unit is the peso, equivalent to the U.S. dollar. In October a central bank (established with a capital of $1,000,000 sub-

scribed by the government) took over the five branches of the National City Bank of New York, and became depository for all government revenues. Private banking was left solely in the hands of two Canadian banks.

Foreign Trade.—In 1940 imports (chiefly foodstuffs and manufactured goods) totalled $10,511,403 (1939: $11,592,166), with the United States supplying 66.37% (1939: 59.19%), Japan 8.3% (9.6%), British India 5.21% (3.68%), Curaçao, 3.92% (2.62%), Great Britain 3.88% (3.11%), Canada 2.53% (1.2%). Exports valued at $18,330,000 (1939: $18,643,302) went chiefly to Great Britain, 34.5% (1939: 31.5%), United States, 24.7% (27.1%), Canada, 15.5% (0.2%), Eire, 7.2% (4.6%), France, 6.2% (11.9%), French Morocco, 4.1% (7.6%), Curaçao, 2.8% (2.5%), Puerto Rico 1.8% (1.2%). The leading exports were sugar products, 74.4% (1939: 65%), cacao 8.8% (10.8%) and coffee 4.2% (9.3%).

During the first quarter of 1941, 69% of imports were supplied by the United States (56% in 1940). Exports declined 27% in the first seven months. Concern over disposal of the 1941–42 sugar crop was dispelled when Great Britain contracted to take the entire crop at better than 1940 prices.

Communication.—External communication is by air, with frequent Pan American airways service, and by sea. There were approximately 3,000 mi. of main highway in the republic in 1941, of which some 900 were motor roads. In 1939 there were 2,816 motor vehicles operating. There were 268 km. of railway in 1941; in addition, sugar and other estates maintained 982 km. of railroad. (L. W. Be.; L. C. Dea.)

Donations and Bequests. More than $10,500,000,000 was contributed to philanthropic purposes by the United States public between the years 1922 and 1938, inclusive. Income tax data reported by the U.S. treasury department and the reports of philanthropic foundations yield these figures. Since many contributions are not reported in income tax returns, it is obvious that the foregoing are minimum figures. Small but numerous contributions to churches, community chests and local charities are made by many persons who are not in even the lowest taxable brackets.

If all such unreported gifts were to be estimated, how great a total they would aggregate is a matter of conjecture. Careful studies have been made, but their estimated totals on annual giving have varied from $500,000,000 to five times that amount. Of the definitely known $10,500,000,000 contributed between 1922 and 1938, $7,105,958,000 was in individual gifts, $2,598,781,000 was in charitable bequests and $816,385,000 was in grants by philanthropic foundations. Included also is $62,695,000 of corporation gifts for 1936 and 1937, the only two years for which government figures are available.

The annual trend is shown by the following:

1. Government figures for individual contributions rose steadily from 1922 to 1928 when they amounted to $532,893,000. Subsequently they fell sharply and recovered so that in 1937 these contributions amounted to $440,010,000. In 1938, the latest available year, they fell off slightly but preliminary figures for 1939 indicate that the upward trend was resumed.
2. There is no well defined trend for charitable bequests. The high for the period 1922–38 was $226,708,000 in 1925; the low was $65,928,000 in 1923. In 1938 the total was $178,616,000.
3. A continuing study by the John Price Jones corporation of publicly announced gifts and bequests in seven large cities (New York, Chicago, Washington, Philadelphia, Baltimore, St. Louis and Boston) gives a more up-to-date view of the trend. While these figures are far from complete, since they include only the larger newsworthy gifts, they do serve as an index. Gifts in 1941 were $71,386,773 as compared with $61,997,707 in 1940, and $58,058,032 in 1939. Bequests in 1941 were $58,473,657; in 1940, $15,723,127; and in 1939, $22,661,863.

The 1942 philanthropic picture would unquestionably be dominated by defense emergency appeals. The response to these appeals were forecast as follows:

1. During the 24-month period—Sept. 1939 through Aug. 1941—a total of $43,209,757.51 was reported to the secretary of state as having been contributed by the people of the United States for relief in foreign countries.
2. During World War I (April 1917 through Nov. 1918), $537,000,000 was given by the U.S. public to major campaigns for war services, an 18% oversubscription of their combined objectives. In the summer of 1941, prior to U.S. entrance into the war, the United Service Organizations for National Defense, Inc. raised $14,626,817, achieving an oversubscription of its goal of 35.8%.

The demands upon United States generosity during 1942 were expected to be great. The response was expected to be generous. (*See* also Carnegie Trusts; Commonwealth Fund, The; Falk Foundation, The Maurice and Laura; Rockefeller Foundation; Rosenwald Fund, The Julius; Russell Sage Foundation.) (J. P. J.)

Donovan, William Joseph (1883–), U.S. lawyer and soldier, was born Jan. 1 at Buffalo, N.Y., the son of a railroad yardmaster and a school teacher. He worked his way through Columbia university, and received his law degree in 1907. In 1916 he organized a cavalry troop in the national guard and served on the Mexican border under Pershing. He saw active service in World War I with New York's famous "Fighting 69th," rising to colonel. He won the nickname "Wild Bill" for his daring and was decorated by the United States, French and Italian governments. In 1924 he was appointed assistant to Harlan Fiske Stone, then attorney general, and was renamed to that post by Pres. Coolidge, 1925–29. In 1932 he ran unsuccessfully for governor of New York on the Republican ticket. He was a military observer in the Spanish Civil War and in the Ethiopian campaign. In July 1940, he went abroad on a "special mission" for Secretary of Navy Knox; on his return he reported on nazi fifth column activities in Europe. He set out on another mysterious mission in Dec. 1940 that developed into a 30,000-mile tour of Europe and African battlefields; this trip was described as a search for facts on the status of Allied resistance to the axis. On July 11, 1941, Pres. Roosevelt named Donovan co-ordinator of defense information at the head of a new intelligence agency designed to filter information and propaganda pouring into the U.S. capital via the press, radio and publications.

Dormoy, Marx (1889–1941), French politician, was named after Karl Marx by his father, a militant French Socialist. Marx Dormoy, also a staunch Socialist, had been deputy from Montluçon since 1931. After the suicide in 1936 of Roger Salengro, interior minister in Leon Blum's popular front cabinet, M. Dormoy took over this key post, which he held until 1938. In Jan. 1940 he voted for expulsion of those French communists in parliament who still adhered to the Communist International, and in July 1940 he opposed giving Marshal Pétain dictatorial powers and protested vigorously against the abolition of parliamentary rule.

Because of his outspoken opposition to Vichy's fascist rule, he was interned after the German occupation. Released early in the spring of 1941 under police surveillance, M. Dormoy was killed when a time-bomb exploded in his hotel room near Montelimar, July 26.

Draft: *see* Selective Service.
Draftees: *see* Selective Service.
Drama: *see* Theatre; Radio.
Dress: *see* Fashion and Dress.
Dridso, A. S.: *see* Lozovsky, Solomon Abramovitch.

Driesch, Hans Adolf Eduard (1867–1941), German biologist and philosopher, was born Oct. 28 at Kreuznach, Germany. An internationally known philosopher, Dr. Driesch lectured in China, Japan and the United States, was awarded honorary degrees by many universities, and was a member of many scientific societies of Europe. During a visit to Harvard university in 1926 he advocated "an eventual United States of the world." But in 1934, a year after Hitler's rise to power, he was won over to the ideas of national socialism and incorporated them in his philosophic teachings. He died in Leipzig in April. (See *Encyclopædia Britannica.*)

Drought. Droughts generally are characteristic of the outer portions of the humid climates where near-by arid conditions sometimes are transported by shifts in the prevailing weather pattern. Less frequently, the heart of a humid area is

affected by serious dryness. Both types of climatic regime were affected by drought in different parts of the world in 1941.

In the subhumid areas, the most serious drought of 1941 was the extension of the 1940 drought in Australia well into the new year. The wheat crop of that country was the smallest in 21 years mainly because of the serious moisture deficiency, and the 1941–42 crop had a poor start as drought continued in many areas. Most of the wheat region was without sufficient rain until midwinter (June, July and August). Dust storms developed in some of the drier areas and soil losses by wind erosion were reported.

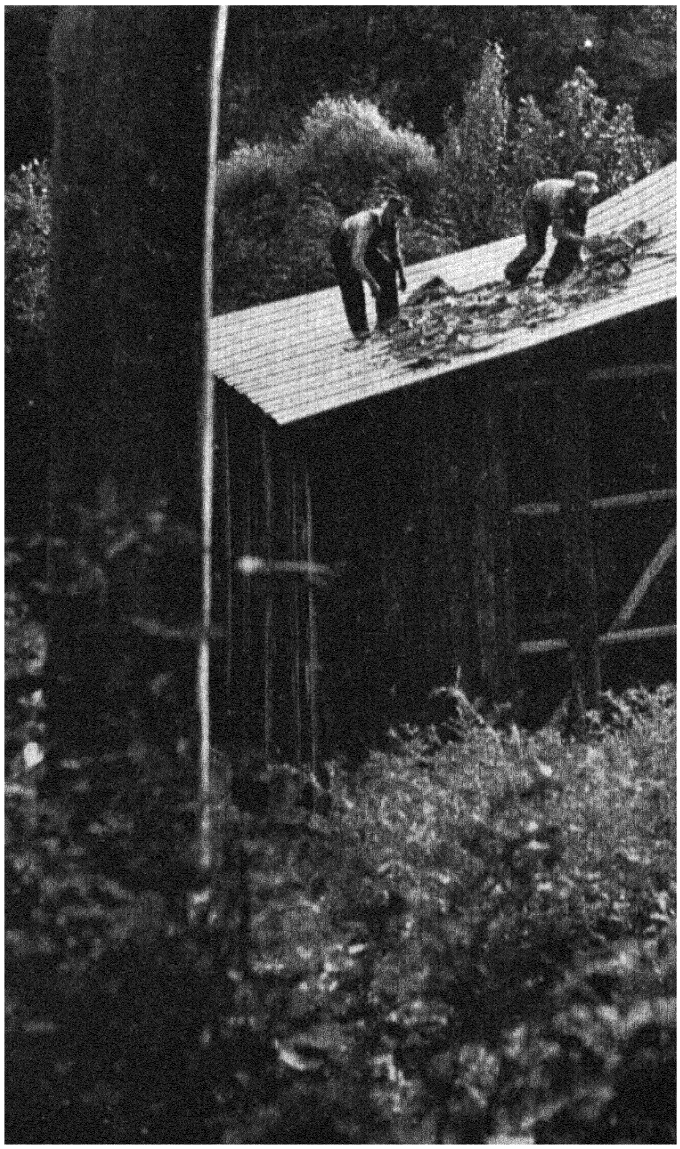
Southern Rhodesia, another subhumid area of the southern hemisphere, experienced a moisture deficiency in cereal-producing sections, although 22% of the wheat acreage is irrigated and therefore less subject to drought risk.

In the United States, the normally very humid east and south suffered from drought conditions while the great plains and other interior parts of the country had adequate rains. There were two periods of drought, in the spring and again in the fall. The spring drought was severe in nearly all regions south of the Potomac and Ohio valleys, lasting from midwinter until early June. May was the driest month, with only 13% of the normal precipitation in South Carolina, 26% in Georgia and Tennessee, 27% in North Carolina, 29% in Virginia and less than 35% in large sections of Kentucky and Alabama. Crops developed poorly and some planting was abandoned on account of the extreme dryness of the soil. Pastures became so poor that a considerable amount of stall feeding was necessary. Water available for hydroelectric plants was critica... ...N. (*See* also METEOROLOGY.)

The fall drought visited these same areas again and included also southern New England and the Middle Atlantic states. In New York city, only 3% of the normal precipitation occurred in September, while Baltimore and Philadelphia each had 15% of their normals. At Asheville, N.C., there was only 9% of the normal in September, and figures covering the entire state of Tennessee indicated only 24% of normal. A considerable fire hazard developed in the upper Appalachians, and some of the woods in New England were closed to the public. The most serious consequence was a shortage of hydroelectric power in the southeast. This also affected the great Tennessee valley power project. Reservoirs were reduced in depth by 15 to 20 feet or more. To conserve power for defense industries, some cities and towns had partial peacetime blackouts.

A midsummer dry period, accompanied by high temperatures, affected the Canadian prairies and the valleys of the Red river of the north and upper Mississippi in the United States. The drought was relatively short-lived, however.

Drought and dust storms were reported in North Africa, figuring prominently in the fighting of British and Italian-German troops there. The inadequate winter rainfall affected the wheat crop of Tunisia. (*See* also AGRICULTURE; IRRIGATION; SOIL EROSION AND SOIL CONSERVATION.) (H. R. B.)



DRYING PINE BARK, an ingredient of cough syrups, on a barn roof in the Great Smoky mountains, N.C., in 1941. Production of U.S.-grown herbs rose sharply during the year as foreign sources of supply were cut off

Drugs and Drug Traffic. In the United States, June 30, 1941, marked the end of the first year of operation of the Food and Drug administration as a unit of the federal security agency, after a third of a century of food- and drug-law enforcement under the department of agriculture. It marked, also, the first complete year of enforcement of all provisions of the Food, Drug and Cosmetic act of 1938.

Emergency measures of a nation-wide scope were the removal from the market of sulphathiazole tablets seriously contaminated with phenobarbital, a highly potent sedative, and seizure of all outstanding lots of a poisonous permanent wave solution. Significant developments of a less spectacular nature were: increased activity against filthy and otherwise unfit foods, made possible through more accurate laboratory methods of detecting contamination and also as a result of the 1938 act declaration that food manufactured or handled under insanitary conditions is adulterated; more regulatory attention to dangerous drugs to prevent indiscriminate sales to lay users; economic cheats resulting from war conditions that have shifted sources of production; and the promulgation of standards for various types of cheese, flour, cream and processed milk, jams and jellies and oleomargarine.

Samples of 31,713 domestic foods, drugs, devices and cosmetics were collected and examined during the fiscal year ending June 30, 1941. Seizures were made of 2,016 interstate shipments of products found in violation of the act, as contrasted with ...,697 in 1940.

Criminal prosecution was instituted against individuals or firms responsible for 1,155 alleged violative shipments, as compared with 337 shipments in 1940. Five injunctions to restrain violations of the act were procured. Of 15,434 import shipments inspected, 2,605 illegal lots were refused entry. Manufacturers submitted 1,376 new drug applications to the administrator during the year. Coal-tar colours certified totalled 2,249,302 lb.

(W. G. CA.)

League of Nations.—In the midst of an ever-extending war, the international control organs—the Permanent Central Opium board (P.C.O.B.) and the Drug Supervisory body (D.S.B.)—

were able to carry through the essential obligations entrusted to them under the various opium conventions. Their activities continued at the headquarters in Geneva, Switzerland with branch offices at Washington, D.C., established there in Feb. 1941 in order to overcome some difficulties of communication with certain countries. With few exceptions governments furnished statistics and information. Of the 65 parties to the conventions not one had denounced because of the war.

On Dec. 1, 1941, the D.S.B. transmitted to governments the "Statement of Estimated World Requirements of Dangerous Drugs in 1941." This statement, covering 177 states and territories, is the basis on which the machinery of international control of the manufacture of and the trade in drugs functions, and indicates the limits within which states are under an obligation to restrict manufacture and trade in drugs. In respect of five principal drugs the limits of the world manufacture and trade in 1941 were estimated at 43·9 tons for morphine, 30 tons for codeine, 4·6 tons for cocaine, 2·9 tons for dionine and 0·8 tons for heroin. In Dec. 1941 the P.C.O.B. issued its report on the work of the board during 1940. Covering information was received from some 150 countries, colonies and dependencies.

Both boards noted that the importance of the national and international control of drugs is not diminished in wartime; on the contrary, as the experience of World War I showed, it is accentuated by conditions which affect the entire world.

The Drug Control service of the League of Nations carried on from Geneva. It distributed to governments all the official information, such as the annual reports, new laws and regulations, seizures in illicit traffic, etc.

Because of restricted trade routes in wartime, the illicit traffic in drugs had considerably diminished. The illicit market, however, was still being supplied mainly from the far east. There was hope that the change in the Iranian administration would put an end to the shipments of Iranian opium to the far east.

The situation in respect of the illicit trade in drugs did not improve in the parts of China which were under Japanese military occupation.

All the vigilance of the national and international controls will be required to prevent a recurrence on a large scale of drug addiction and smuggling, which occurred after World War I, and which moved governments to set up, after the war, the control system which continued to function throughout 1941.

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Drunkenness: *see* INTOXICATION, ALCOHOLIC.

Dry Farming: *see* SOIL EROSION AND SOIL CONSERVATION.

Dubois, Eugene (1858–1941), Dutch physician and geologist. In 1891 Dr. Dubois discovered skeletal fragments in Java of what he then believed was the "missing link" between the apes and man. The fragments consisted of a skull top, thigh bone, three teeth and part of a lower jaw. These fossilized remains, which were allegedly 500,000 years old, were named by Dr. Dubois *Pithecanthropus erectus*. At first he claimed that his find was an ape-man, but he changed his views several times, and in 1937 he reported that the Java fragments were really those of an ape and not a man. He died at his home in the Netherlands in February.

Duchesene Tunnel: *see* TUNNELS.

Dunkerley, William Arthur: *see* OXENHAM, JOHN.

Dust Storms: *see* DROUGHT.

Dutch Borneo: *see* BORNEO; DUTCH EAST INDIES.

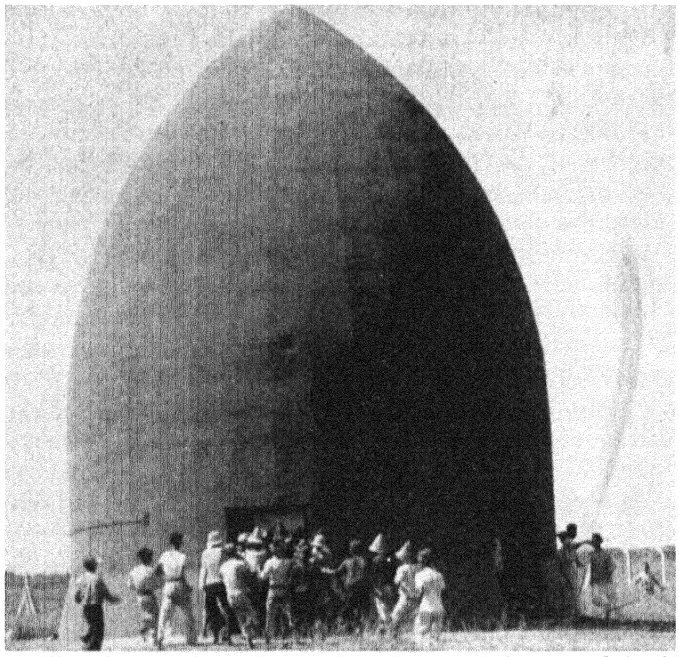
Dutch Colonial Empire: *see* DUTCH EAST INDIES; NETHERLANDS COLONIAL EMPIRE.

Dutch East Indies. The largest colonial possession of the Netherlands and the main centre of Dutch participation in World War II against the axis powers, the Dutch East Indies consists of a huge archipelago, with several large islands, Java (*q.v.*), Sumatra (*q.v.*), Celebes, Borneo (*q.v.*) and New Guinea (part of Borneo is British and part of New Guinea is Australian) and many smaller ones. The archipelago is located near the equator from 6° north latitude to 10° south latitude. It is south of the Philippines, southeast, east and west of the Malay peninsula and north of Australia. Capital, Batavia. Governor general in 1941 (appointed in 1936): Jonkheer Dr. A. W. L. Tjarda van Starkenborgh-Stachouwer. Area, 733,681 sq.mi.; pop. (1930), 60,731,025; estimate (1940), 70,476,000. More than two-thirds of the population of the archipelago lives in densely populated Java and in Madura, a small adjacent island. The Dutch East Indies is administratively divided into Java and Madura and the so-called Outer Islands, which are much less developed and less thickly populated. The official estimate of 1940 credited Java and Madura with a population of 48,416,000, and the Outer Islands with 22,060,000. In 1930 there were 8,238,570 inhabitants in Sumatra, 2,194,533 in Borneo, 4,226,586 in Celebes. Largest cities: Batavia (437,000); Surabaya (313,000); Bandung (167,000).

History.—The generally placid history of the Dutch East Indies, broken only by a few native uprisings, became decidedly stormy after the German occupation of the Netherlands in May 1940. A state of chronic tension developed in the relations between Japan and the East Indies. There were official and semi-official statements in Tokyo that claimed the East Indies as part of the greater east Asia in which Japan's interests should predominate—a claim that was firmly rejected by the Dutch authorities. An economic mission, headed by Minister of Commerce Kobayashi, was sent to Batavia in Sept. 1940. The negotiations initiated by this mission led to no definite results, and Kobayashi returned to Japan in December. Japan's desire for larger shipments of oil from the East Indies was satisfied to some extent, however, when the big Mitsui firm concluded an agreement with the Royal Dutch and Standard Vacuum interests, providing that Japan's import quota of petroleum products should be raised from 494,000 tons to 1,800,000 tons. However, high-octane aviation gasoline was excluded from the scope of this agreement. Early in 1941 a new Japanese delegation, headed by the veteran diplomat, Kenkichi Yoshizawa, arrived in Batavia. Japanese demands expanded until they included permission to explore the Outer Islands, concessions, the establishment of an air line from Japan and mining and fishing rights. The Dutch showed little disposition to accede to these demands, and Yoshizawa left the Dutch East Indies in June 1941.

In the following month the general imposition of sanctions on Japan by the United States, Great Britain and the Netherlands Indies brought all trade to a standstill. Although the Dutch East Indies are more remote from Japan than the immediate objects of the Japanese onslaught, Hongkong, the Philippines and Malaya, their economic wealth was undoubtedly one of the main objectives of the Japanese southward drive, and Japanese landings in Tarakan island, off Borneo, and in the northeastern part of Celebes took place on Jan. 11, 1942. The Dutch navy and air force had already been in action against the Japanese, co-operating with the British and Americans; and it was reported that Dutch submarines had sunk a number of Japanese transports and cargo vessels. (*See* WORLD WAR II.)

Education and Religion.—There were 21,440 schools of all types in the Netherlands Indies, with 49,622 teachers and 2,324,505 pupils, in 1939. Government expenditure on education in 1939 was 31,267,100 florins. In 1930, 7.2% of the population of the archipelago was literate. The great majority of the native population are adherents of the Mohammedan



NATIVES of the Dutch East Indies . . . into a new beehive type of air-raid shelter in 1941 during a drill

religion, although in some of the islands Hindu and pagan rites are mixed with the doctrines of Islam. There are about 2,500,000 Christians, about 1,000,000 Buddhists and a considerable number of primitive Animists.

Defense.—The Netherlands East Indies army at the time of the Japanese invasion was estimated to possess a strength of 125,000 men. All able-bodied Netherlanders between the ages of 18 and 46 were conscripted for military service after the invasion. Conscription was applied in some degree to the native population. The navy, according to reliable estimates, consisted of 3 cruisers, 8 destroyers, 18 submarines and 42 torpedo boats. The air force had been considerably reinforced by purchases from the United States and was supposed to number between 500 and 1,000 planes, including Glenn Martin, Curtiss and Brewster Buffalo types, Dutch Fokker fighting planes and Dornier flying boats.

Finance and Banking.—The Dutch florin (53.1 cents U.S. in 1941) is the unit of currency. The Java bank is the central banking institution and controls the note issue, and there are several other Dutch and foreign banking institutions in the archipelago. The amount of currency in circulation increased from 198,921,000 florins on April 1, 1940 to 215,885,000 on April 1, 1941. The budget for 1941 anticipated 509,000,000 florins of revenue and 644,200,000 florins of expenditure. The long-term debt of the Netherlands Indies is negligible, only 1,212,000 florins at the end of 1940. Outstanding treasury paper, on the other hand, increased from 122,600,000 florins at the end of 1939 to 206,000,000 florins at the end of 1940.

Trade and Communication.—Imports in 1940 were 444,300,000 florins and exports were 873,500,000 florins. During the first four months of 1941, imports were 118,900,000 florins and exports were 287,500,000 florins. There was a substantial increase in the export trade of the Netherlands Indies with the United States, exports to the U.S. rising from 146,900,000 florins in 1939 to 290,900,000 florins in 1940, while imports from the U.S. increased from 63,700,000 florins to 102,800,000 florins over the same period of time. There was a strong demand in the United States for such strategic raw materials as rubber, tin, bauxite and cinchona (the source of quinine), while the Netherlands Indies purchased planes and munitions in the United States. There was a considerable shift in the character of Netherlands Indies foreign trade under the impact of the war. There was a booming market for the following commodities (export figures for 1940 in parentheses): rubber (581,941 tons); crude tin (22,388 tons); tin ore (30,000 tons); petroleum (9,343,700 tons); bauxite (237,554 tons); coal (792,657 tons); cinchona (8,587 tons). Sugar and coffee exports, on the other hand, were down by 40% in 1940, by comparison with 1939, and coffee and sugar, along with pepper, copra and tobacco, were reckoned among the "weak products" in export trade because of closed markets and lack of cargo space.

The Dutch East Indies in 1940 contained 43,450 mi. of highways and 4,620 mi. of railways, of which 3,387 were in Java and 1,233 in Sumatra. There were 85,620 motor vehicles of all types in the archipelago in 1940. About 10,870 steamers, with a tonnage of 12,456,664, cleared from East Indian ports in 1939, together with 3,203 sailboats, with a tonnage of 167,675. The Royal Netherlands Airways was formerly one of the main routes of air communication between Europe and the orient, with its terminus at Batavia. The European connection ceased after the German occupation of the Netherlands; but an island service was maintained, connecting the principal cities of Java and Sumatra. There were also air routes between Surabaya and the oil ports of Balik Papan and Tarakan and between Java and Macassar, north Celebes and New Guinea. (*See* also JAPAN; NETHERLANDS COLONIAL EMPIRE.)

BIBLIOGRAPHY.—*1930 Handbook of the Netherlands Indies; Statistical Abstract of the Netherlands Indies* (1940); Amry Vandenbosch, *The Dutch East Indies, Its Government, Problems and Politics; The Netherlands Indies*, monthly publication of department of economic affairs (Batavia). (W. H. CH.)

Dutch Guiana: *see* SURINAM.

Dyestuffs. World War II directed particular attention to the indispensability of an integrated chemical industry to the welfare and security of the United States. The great value of a U.S. organic chemical industry in the existing emergency was duly significant since it supplied large quantities of vital materials for the manufacture and colouring of all types of textiles, paper, leather, paint, rubber and other diversified products. Many organic chemicals and intermediates normally required in dyestuff synthesis were utilized in the defense program. Despite this, however, dyestuff production reached a peak never before attained. The latest available figures for coal-tar dyes manufactured in the United States were for 1940. These show production of 127,834,000 lb., being an increase of 6·4% over the preceding year while sales were 8·8% higher than in 1939 and valued at $76,432,000. Production of fast vat colours increased slightly and represented 14·8% of the total.

The activity in both sales and production in 1940 was due largely to improved business caused by increased civilian consumption and indirectly by military requirements. Production for strictly military use, however, did not constitute a substantial portion of the 1940 output of synthetic organic chemicals. Other factors which influenced production were the building up of inventories by producers and consumers and an increase in exports together with a decrease in dye imports. In 1940, 1,800,227 lb. of coal-tar dyes were imported into the United States representing a decrease of 65% over the preceding year. Importations again covered colours which were not manufactured in the U.S. because of patent restrictions and specialty colours whose sales volume was not sufficiently large or important to warrant expenditures for manufacturing equipment.

Preliminary figures for 1941 indicated that consuming industries were supplied with a greater quantity of dyes than during any previously known period in the history of the United States. It was estimated that production was 30%-40% higher than for 1940 with dye plants working on a 24-hour schedule.

Processors recognized the advantages of colour durability in merchandising textiles, and the utilization of vat colours in a wide variety of fibres and constructions continued to increase. As a result, the quality and fastness of the dyed materials reaching the ultimate consumer were better than ever before. For military purposes also, vat colours played an important part. Because of their outstanding fastness, certain vat colours were almost exclusively reserved for the production of olive drab and khaki shades on cotton uniform cloths.

Constantly changing conditions, the increasing demand for textiles of all descriptions for both civilian and military needs and the shortages of necessary materials brought with them new and complex problems. The emergency compelled the dye and textile industries to derive the utmost value from available raw materials. This required the closest co-operation between producer and consumer and called for concerted action on the part of textile, machinery, chemical and dye manufacturers. (A. G. BN.)

Ear, Nose and Throat, Diseases of.

Lipid Pneumonia.—More than fifteen years ago Laughlen called attention to a type of pneumonia caused by the aspiration into the lungs of oily medicaments administered either intranasally or by mouth. Several names have been applied to this condition, such as lipoid pneumonia, pneumoliposis, paraffin pneumonia, lipid pneumonia, steatosis of the lungs, lipoid cell pneumonia, but the term "lipid pneumonia" as suggested by Graef seems to be the most appropriate.

Extensive studies of this subject have been undertaken by many investigators, and to attempt even the most superficial review

would not give adequate credit to the many deserving workers. With this thought in mind, the essayist has drawn largely from the writings of Paul R. Cannon of the department of pathology of the University of Chicago, who has so thoroughly reviewed this problem.

Briefly the entrance of foreign lipids into the lungs produces varying degrees of inflammatory changes in the lungs ranging from a simple congestion and oedema to necrosis, and these effects may be acute, chronic, localized or diffuse. More so has it been found that animal oils, especially cod-liver oil, are highly irritating, though the vegetable oils such as olive oil, cotton-seed oil, sesame oil and poppy-seed oil are relatively nontoxic, the latter, as iodized poppy-seed oil, has been very useful in bronchography. Even liquid petrolatum, though less damaging, still is far from bland, and many pathologic changes have been found experimentally in the lungs of animals, when purified liquid petrolatum was instilled intranasally.

These points are of extreme importance because of the widespread use of various oily preparations marketed by manufacturing chemists and advertised so widely by the press, radio and other sources and recommended as harmless "nasal oils."

Many patients have been carefully studied by every possible method of precision to determine the actual cause of a persistent chronic cough and review of the history of such cases, in many instances, proved that the patient had been using drops or spray of a "nasal oil," many for considerable periods of time.

In order to prevent lipid changes in the lung from this source, it is only necessary to eliminate the use of such preparations.

The safest preparations for nasal spray or instillation are those of a watery base, either isotonic saline or dextrose.

Photographic Study of the Larynx by Mirror Laryngoscopy.—All laryngologists admit that accuracy in the evaluation of the laryngeal image is necessary; exactitude in the diagnosis is secured, proper prognosis and therapy follow. Louis H. Clerf, professor of broncho-oesophagology, Jefferson Medical College of Philadelphia, after reviewing in moderate detail some of the photographic studies of the larynx by distinguished laryngologists in 1860, continued in 1941 the discussion of some of the procedures used by others, bringing the subject down to date. He also presented his own contribution of a photographic unit embodying the principle of the Garel camera. All the details can be found in the original presentation as noted in the bibliography.

This simple apparatus for photographing the larynx by mirror laryngoscopy may be readily employed because it requires no additional personnel to operate and gives uniformly good results in a majority of patients whose larynges can be visualized by mirror laryngoscopy.

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(G. M. C.)

Earnings, Company: *see* BUSINESS REVIEW: *Company Earnings.*

Earthquakes: *see* DISASTERS; SEISMOLOGY.

East Africa, British: *see* BRITISH EAST AFRICA.

Eclipses of Sun and Moon, 1942: *see* CALENDAR, p. xx.

Economic Association, American: *see* AMERICAN ECONOMIC ASSOCIATION.

Economic Defense Board: *see* ECONOMIC WARFARE, BOARD OF.

Economic Warfare, Board of.

The Board of Economic Warfare was established under the name of Economic Defense board by President Roosevelt, in an executive order dated July 20, 1941, for the purpose of developing and co-ordinating policies and programs intended to strengthen the international economic relations of the United States.

Vice-President Henry A. Wallace was made chairman of the board; and the secretaries of state, treasury and war, and the attorney-general, and the secretaries of the navy, agriculture and commerce were also named in the initial order as members. The chairman was authorized to appoint other members, and each member was authorized to designate an alternate. Other departments and agencies of the government were directed to designate officers to represent the department or agency in its continuing relationships with the board.

As defined in the executive order, the functions and duties of the board were to advise the president on essential economic defense measures; to co-ordinate the policies and actions of the several departments and agencies carrying on activities relating to economic defense; and to develop integrated economic defense plans and programs for co-ordinated action by the departments and agencies concerned. The board also began immediate investigations of the relationship of economic defense measures to post-war economic reconstruction.

Soon after being formed, the board named Milo Perkins as executive director.

The first move for expansion of the board's authority came on Sept. 15, 1941 when the president signed an executive order placing the Office of Export Control under the then Economic Defense board. Brigadier General R. L. Maxwell, who had been administrator of export control, was assigned to duty in the war department.

The executive order of Sept. 15 also designated the board as the agency to obtain, develop and determine over-all estimates of materials and commodities required for export purposes in the interest of the economic defense of the United States, exclusive of lend-lease operations, and to advise the Supply Priorities and Allocations board (*q.v.*) of such estimated requirements.

When the Office of Export Control came under the Economic Defense board, the division of controls of the department of state was also put under the board as the commodity licensing division of the Office of Export Control.

One of the activities carried on by the Office of Export Control had been a clearing service, to which exporters, manufacturers and foreign importers submitted proposals for the export of materials and commodities. This was reorganized under the board to expedite such clearances through the several federal agencies concerned with the control of exports and related financial transactions.

Another responsibility was given to the board in the executive order of Oct. 28, 1941, which established the Office of Lend-Lease Administration (*q.v.*) and authorized the administrator to make appropriate arrangements with the then Economic Defense board for the review and clearance of lend-lease transactions which affected the economic defense of the United States.

In recognition of the growing importance of the government's economic program in the western hemisphere, the vice-president announced on Nov. 22, 1941, that, with the approval of the president, he had appointed the co-ordinator of Inter-American Affairs as a member of the then Economic Defense board. At the same time the board began a reorganization of its units into four regional divisions under the direction of a chief of operations, Lieut.-Col. Royal B. Lord. The divisions were: the European and African, of which Morris S. Rosenthal was appointed chief; the far eastern, with Charles B. Rayner, chief; the British empire, with William F. Stone, chief; and the American hemisphere, with Carl B. Spaeth, chief. The combined personnel of the commercial

and financial division of the co-ordinator's office and the divisions of the board engaged in western hemisphere matters became the American hemisphere division of the board.

Subsequently, the facilities of the tariff commission, and the bureau of foreign and domestic commerce of the department of commerce, were placed at the service of the board for the duration of the war.

The title of the board was changed from the Economic Defense board to the Board of Economic Warfare, by executive order, on Dec. 17, 1941.

A statistical summary of the work of the Office of Export Control during 1941 follows:

The total number of commodity licences granted, from Jan. through Nov. 1941, was 214,771. The dollar value of these commodities licensed for export, excluding arms and ammunition, was $956,012,413. The value of arms and ammunition licensed for export during this period was $1,920,388,433. The technical data licence division, between April 15, 1941, and Dec. 22, 1941, received 16,771 applications for export licences. During this period, 11,271 special licences and 758 blanket licences were granted. Up to Dec. 11, 1941, the requisitioning division had executed 257 requisitions. Of these, 225 cases had been referred to the Compensation board. A total of 95 cases, representing a value of more than $10,000,000, had been heard by the board. Pending, as of Dec. 20, 1941, were 130 cases of an estimated value of about $18,000,000.

A total embargo on exports to Japan and its occupied territories, by revoking all licences for the shipment of U.S. goods to those countries and to all Japanese nationals anywhere in the world, was established immediately following the attack on the United States by the Japanese armed forces. Export control was extended, as of Dec. 23, 1941, to cover all articles and materials not previously brought under control. Even before that date, approximately 90% of all U.S.-produced commodities was under licensing regulations.

Continued flow of articles and materials to American republics and other friendly destinations under broad general licences was encouraged under policies of the board. (*See* also DEFENSE, NATIONAL [U.S.].)

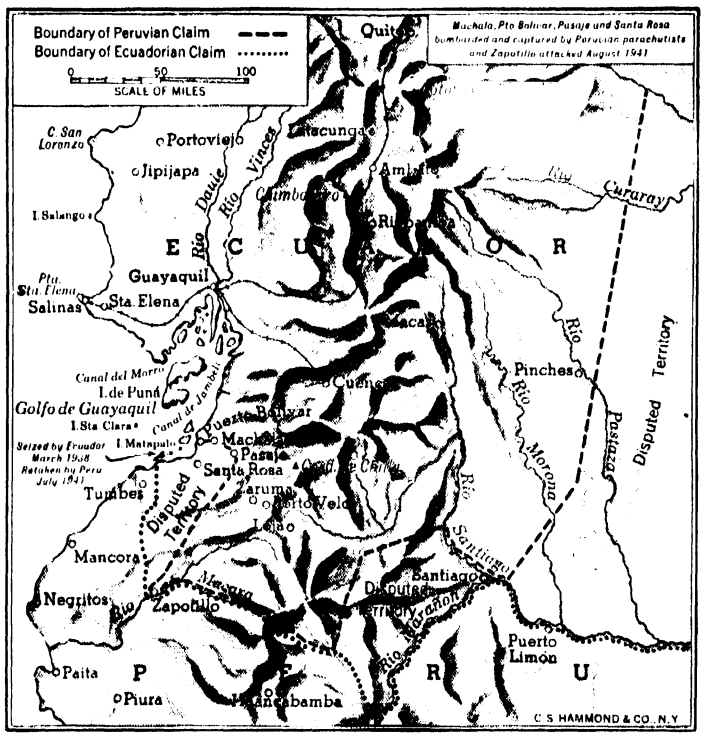
(H. A. WAL.)

Ecuador, a South American republic, located on the Pacific coast, astride the equator and the Andean plateau; the area (including the Galápagos islands, 2,400 sq.mi.), according to Ecuadorian claims, was 337,392 sq.mi. in 1941, but a third of this was disputed with Peru. The population was estimated in 1941 at around 3,500,000. Chief cities: Quito, the capital (140,000); Guayaquil (120,000); Cuenca (42,000); Riobamba (21,200). President in 1941: Dr. Carlos Arroyo del Río.

History.—During 1941, political unrest and uncertainty, underlaid by the acute boundary dispute with Peru (*q.v.*) which at times broke into open hostilities, dominated Ecuador's history as the World War II crisis steadily increased its threat. Disorders were frequent, and many observers felt that only divided opposition permitted Pres. Arroyo's continuance in power. The delicate political balance prevented acceptance of proposed border settlements with Peru or consummation of any agreement with the United States permitting a naval or air base on the strategic Galápagos islands, lest the opposition be given political ammunition. At the same time, the situation gave openings for pro-axis propagandists, who were active throughout the year. Upon Russian entry into the war, nazi agents were active in propaganda among conservative, strongly Roman Catholic elements. Earlier, one German diplomatic attaché was expelled. Anti-Japanese feeling was strong, especially after alleged Japanese military aid to Peru. Following formal entry of the United States into World War II, Ecuador accorded that country nonbelligerent rights and interned a number of Japanese.

Defense.—The army has a peacetime strength of 7,500, with 12,500 reserves. The small air corps, formerly Italian-trained, was supervised by United States army aviation officers after March 1941. The navy comprised one training ship in 1941.

Finance.—The monetary unit is the sucre (value: 6¾ cents U.S. in 1941). The 1942 budget called for receipts and expenditures of 130,800,000 sucres (1941: 125,902,000). National defense was allotted 18.8% of the grand total, education 15.4%.



MAP OF TERRITORIES disputed by Ecuador and Peru. Fighting between the two countries broke out in July 1941

Trade and Resources.—In 1940, imports amounted to $11,155,000 (1939: $10,184,000), with the United States supplying 59.4% (1939: 48.7%), Japan 10.5% (5.3%), Great Britain 7.5% (5.5%), Italy 4.1% (3.1%), France 3.6% (4.9%), Germany 2.0% (18.1%). Latin American countries supplied 5.5% (1939: 6.9%), with 1.4% each from Colombia and Chile. Exports, $10,549,100 (1939: $11,514,000), not including $753,487 gold (all to the United States), went largely to the United States (59.9%; 1939: 49.1%). Other Latin American countries took 27.3% (1939: 19.9%), with Uruguay 8.2% (entirely petroleum), Peru 4.7%, Colombia 3.6% and Chile 3.0%, leading. Japan (3.3%; 1939: 3.9%) and Great Britain (2.1%; 1939: 3.7%) were the largest non-American customers. Continental European countries took only 5.0% (1939: 22.8%).

In the first nine months of 1941, imports declined 20.3%, with the United States supplying 74%; exports increased 14.7% (73.6% to the United States), with especially sharp rises in mineral shipments except petroleum, which declined more than a third. The leading export commodities in 1940 were: cacao, 28.3% (1939: 36.9%); cyanide precipitates, 28.1% (26.2%); petroleum, 24.6% (24.9%); coffee, 15.8% (15.1%); rice, 14.1% (6.4%); copper and lead concentrates, 10.5% (none in 1939); tagua (vegetable ivory), 8.4% (9.5%); bananas, 6.3% (6.9%).

Cacao and coffee are the chief export crops, bananas (half to Chile) the third. In 1941, the cacao and rice crops were among the best ever. Cotton was insufficient for domestic production in 1941, sugar only slightly more than adequate. Balsa wood production increased greatly after 1939 (1,402 tons export), with 2,298 tons exported in the first eight months of 1941. Kapok (1940: 384 tons) and rubber (1,509 tons) gave promise of considerable expansion.

Petroleum output (1940: 2,349,000 bbl.) fell sharply in 1941. In 1940 1,389,678 grams of gold were mined, over 50% greater than in 1937. Petroleum, cyanide, copper and lead production was almost entirely in foreign hands in 1941, and contributed little to the national economy.

Communication.—External communication is by sea and by Pan American airways. Except for petroleum, nearly all exports are shipped through Guayaquil. Internal communication is by domestic airlines (formerly German-controlled), 600 mi. of railway, the Guayas river and a 3,500-mi. highway system. The last was thoroughly inadequate in 1941, but was being greatly improved and expanded under credits from the U.S. Export-Import bank. (*See* also HISPANIC AMERICA AND WORLD WAR II.)

(L. W. BE.)

Eden, (Robert) Anthony (1897–), British statesman, was born June 12 and was educated at Eton and at Christ Church, Oxford. After service in World War I (1915–18), he contested the Spennymoor division of Durham in 1922, and in the following year he was elected for Warwick and Leamington, which he thereafter continued to represent. From 1926 to 1929 he was parliamentary private secretary to Sir Austen Chamberlain. He then became undersecretary for foreign affairs and, in 1934, lord privy seal and a privy councillor. In June 1935 he entered the cabinet as minister without portfolio

for League of Nations Affairs, holding this post until the following December, when he became foreign minister. Disagreement with Prime Minister Chamberlain over the latter's policy of "appeasing" Germany and Italy led to his resignation Feb. 20, 1938. Upon the outbreak of war Sept. 3, 1939 he re-entered Chamberlain's cabinet as dominions secretary. On May 11, 1940, he was named secretary of state for war in Churchill's cabinet, and on Dec. 23, 1940, he was appointed to the foreign ministry again.

In Feb. 1941 Eden arrived at Cairo on a military and diplomatic mission in the middle east and the Balkans. On Feb. 26 he was in Ankara, Turkey with Gen. Sir John Dill to confer with Turkish leaders, and the following day it was announced that Britain and Turkey had reached "full agreement on all points." Eden then proceeded to Athens, where on March 5 he promised Greece the greatest possible military aid. On March 18 he conferred with the Turkish foreign minister at Cyprus, and at the end of the month he returned to Athens for conferences on joint strategy. He was back in London April 10.

Eden was praised by Churchill in July for his part in concluding the British-U.S.S.R. pact, and he also had a hand in the Polish-U.S.S.R. pact signed at London July 30. At the end of 1941 Eden travelled to Moscow for a conference on war problems with Stalin.

Education. **Education and the Threat of War.**—The threat of war had already begun to cast its shadow over education in the United States before the actual outbreak of hostilities in the last month of 1941. The rise of defensive industries, the development of new industrial centres and the consequent migration of families, and the selective draft had already begun to affect the normal progress of education and to lend additional significance to all the implications of the movement which had been started in 1940 for education for national defense. It became clear during the year that two important issues were involved in this movement. The first was concerned with the more immediate problems of national defense—the supply of an adequately trained personnel for defense industries and the provision of educational facilities for the children of workers attracted to the new defense centres. The second issue was to define more clearly than ever before the meaning and significance of those democratic ideals which were to be defended, preserved and made the basis of an educational program for the United States. While educators had already begun to devote attention to the second issue since the Congress on Education and Democracy was held at Teachers college in Aug. 1939, and during 1940, a strong lead was given by President Franklin D. Roosevelt in his reiterated emphases on the four freedoms.

Provision of Educational Facilities.—Special provisions were made during 1941 by local, state and federal agencies to organize existing facilities for vocational education and to create new schools and courses to meet the emergency. Despite lack of qualified teachers, suitable buildings and other facilities, educational authorities met the emergency by utilizing whatever buildings were available and by adopting two, three or even more shifts for vocational training. With the aid of a federal appropriation of $65,000,000, administered by the U.S. Office of Education, it was estimated that more than 1,500,000 defense workers would be trained, while another appreciable number were being trained under the auspices of the National Youth administration (*q.v.*) and the Civilian Conservation corps (*q.v.*), giving a total of 4,000,000 persons in all trained for aircraft construction, for shipbuilding and electrical industries, and for the mechanics branches of the army and navy. Training under emergency conditions might prove to be valuable when the time came to meet the needs of men returning from military service or from defense to nondefense industries.

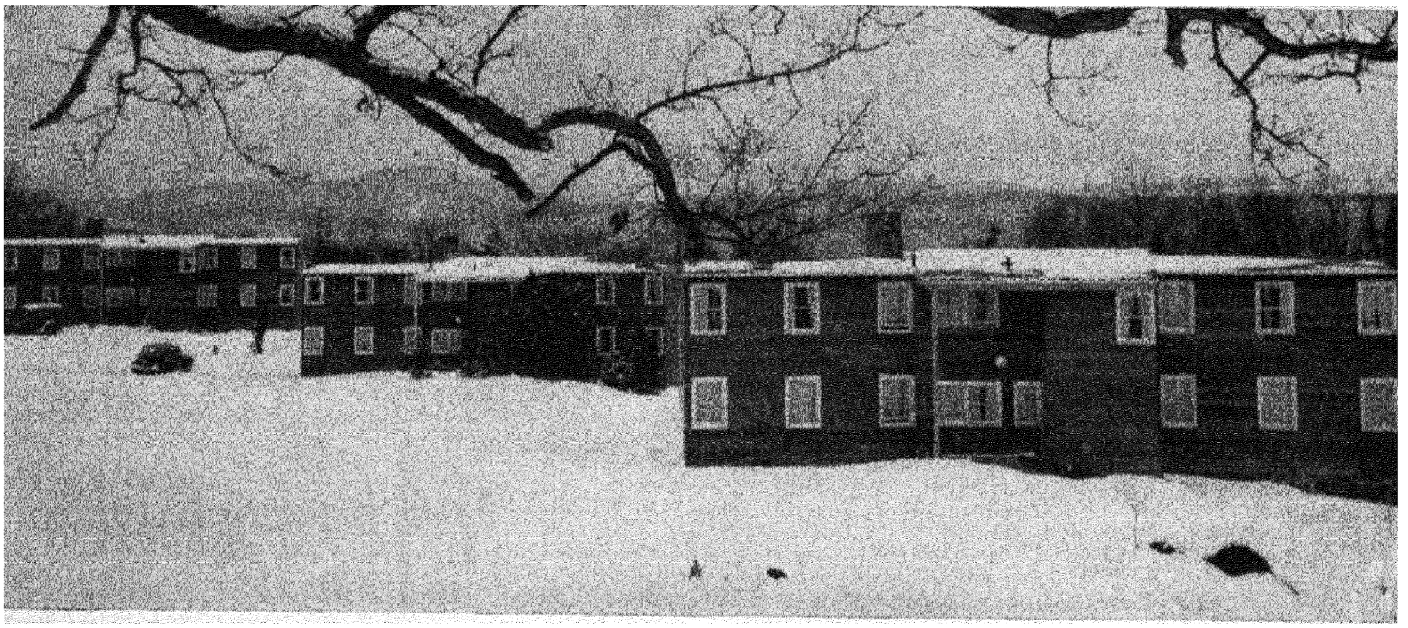
The impact on the regular system of education was perhaps not altogether unexpected. At the high school level the shift from general to vocational education, which had been under way for some years, was intensified, while at the college level there was an increase in the number of students in the science, engineering and medical divisions in preparation for defense services. In New York city alone the enrolments of students in vocational schools and courses showed an increase of 15%.

More serious, however, was the problem created for administrative officials by the rise of booming defense centres and the establishment of army camps. A shift in the school population at the elementary and high school levels, estimated at about 300,000, had to be met by the provision of new classrooms and additional numbers of teachers. At the beginning of the school year in Sept. 1941, a shortage of school facilities was reported in 500 localities; from 15,000 to 20,000 children for whom school accommodations were not available enjoyed extended school vacations. Congress appropriated $150,000,000 to be devoted to the construction of school buildings to help defense areas to take care of the increased school population. The situation was further complicated by the withdrawal of teachers for army and defense services, while the new positions to be filled in the defense areas required, according to some estimates, about 1,000 teachers.

It was too early, particularly since war had not yet broken out, to estimate the probable future trend. Nevertheless some alarm began to be felt for the status of general education in the high schools and the liberal arts in the colleges. A decline was already noted in the number of students taking courses in French and German, paralleled by an increase in the numbers studying Spanish, partly because of public attitude to France and Germany in general and partly because of the widely cultivated interest in Latin-American relations. This interest was part of a general interest in contemporary affairs including social studies, international relations and their backgrounds in history.

Shortage of Teachers.—The shortage of teachers was not confined to the new boom towns. On the basis of a nation-wide survey the National Commission for the Defense of Education through Democracy announced that the country faced a serious shortage of qualified teachers, which would be felt most acutely in rural schools and in the field of vocational education. The reason was to be found only in part in the selective draft; more important was the attraction of better salaries in defense industries. Enrolment in state normal schools and teachers' colleges showed a decrease of 11% and in university schools of education where secondary school teachers are prepared, of 8%. A number of states (Louisiana, Tennessee, Kentucky, Georgia, Virginia and Nebraska) planned to grant emergency certificates to teachers, a plan which meant lowering of standards. The nature of the shortage varied in different parts of the country, at different levels of the school system and in different subjects. In the larger metropolitan areas there had in fact existed an oversupply of teachers. To meet the situation of a shortage in some parts of the country and an oversupply in others the suggestion was made that the U.S. Office of Education co-operate with local and state authorities in distributing teachers where they are needed. Looked at from the long-term point of view the shortage, according to another suggestion, could only be remedied by increasing the salaries of teachers; it was estimated that an average country-wide increase of 15% would add approximately $200,000,000 in wages to teachers of the United States in the next academic year.

Educational Statistics.—The following estimates for the school year 1941–42 were issued by the U.S. Office of Education



AN EVACUATION CAMP for school children of New York city was built in the spring of 1941 at New Milford, Conn. to serve as a model for other similar projects should Manhattan be subjected to air raids

in Nov. 1941: The enrolment in elementary schools was 20,707,000 (18,482,000 in public and 2,225,000 in private schools); the kindergartens had an enrolment of 665,000 (625,000 in public and 40,000 in private schools); the number of teachers in elementary schools was 700,000 (625,000 in public and 75,000 in private schools). In four-year high schools there were 7,334,000 pupils (6,834,000 in public and 500,000 in private schools) taught by 350,000 teachers (315,000 in public and 35,000 in private schools). According to the estimates, 2,520,000 pupils attended one-teacher schools while 4,600,000 were transported to schools at public expense. In institutions of higher education it was estimated that the total enrolment was 1,450,000 students.

Teachers' Salaries.—Before a general recovery from the effects of the depression period could be effected, teachers' salaries began to feel the influence of rising prices. In view of the better opportunities provided in defense industries which have already been mentioned, the situation was viewed with considerable alarm. The salary losses due to the depression reductions were being made up only in cities of 100,000 and over. Nearly all cities of over 30,000 and 60% of the smaller cities were reported to have salary schedules. The general picture for the country as a whole was as follows in 1940–41: In cities with populations from 2,500 to 5,000 the median salaries for elementary school teachers was $1,149, rising to $2,268 in cities over 100,000; the range of median salaries of high school teachers in the same localities was from $1,428 to $2,768; of elementary school principals from $1,878 to $3,420; of high school principals from $2,136 to $4,806; and of superintendents from $3,219 to $8,605. (See *School and Society, School Life* and the *Journal of the National Education Association.*)

A serious issue was raised in 1941 as a result of the movement for equal pay for white and Negro teachers. It was estimated that in order to bring the salaries of Negro teachers in the south into parity with those of white teachers the additional funds required would amount to $26,036,421 (ranging from $252,488 in Oklahoma to $3,029,550 in South Carolina). Should the movement be extended to bring Negro schools into even approximate equality with white, from $3,000,000 to $8,000,000 would be needed for supplies and $9,000,000 for additional Negro teachers to provide the same teacher-pupil ratio in Negro as in white schools. In 1941 there were 29 pupils per white teacher as compared with 39 pupils per Negro teacher; the average cost per white pupil in 12 southern states was $45.82 as compared with $16.51 per Negro pupil; the investment in school grounds, buildings and equipment was $184 per white child enrolled and $42 per Negro child; the average salaries of white teachers in these states showed a range from $625 a year in Arkansas to $1,565 in Maryland for white teachers and from $237 a year in Mississippi to $1,225 in Maryland for Negro teachers. The situation raised a serious issue which in the opinion of many educators could only be settled in a nation-wide program of federal aid to equalize the burden of providing equality of educational opportunities. (See *Teachers' Salaries in Black and White* prepared by the National Association for the Advancement of Coloured People, New York; also information prepared by the Commission on Interracial Cooperation, Inc., Atlanta, Ga.)

Universities and Colleges.—A serious decrease in university and college enrolments had been generally expected as a result of the selective draft and the opportunities for employment in defense industries. According to the report prepared each year by President Raymond Walters for *School and Society* (Dec. 13, 1941, pp. 539 ff.) the statistics of attendance for 1941 showed a total of 838,715 full-time students or 9.16% less than in 1940, and of 1,269,354 students, including part-time and summer session, or a decrease of 8.88%. All geographical divisions showed smaller enrolments ranging from a decrease of 2.07% in the south Atlantic to 8.97% in the west north central division. The heaviest losses (16.17%) were suffered by 57 universities under public control and by 77 independent teachers' colleges (15.35%); 52 privately controlled universities showed a decrease of 5.9%, while ten had a slight increase. Freshman classes showed a drop of 4.5% as compared with 1940, when there had been a drop of 2% as compared with 1939.

Junior colleges also showed a marked decrease in their enrolments. According to a study made by the American Association of Junior colleges, which received replies from 187 or 72% of the public colleges and from 200 or 57% of the private junior colleges, 29 of the public institutions reported an increase, 19 no change and 139 a decrease. The range was from an increase of 40% to a decrease of a similar amount. Of the private institutions 73 reported an increase, 56 no change and 71 a decrease, with a range from an increase of 60% to a decrease of 50%. (See *School and Society,* Nov. 1, 1941.)

There was a definite shift in the distribution of students. Thus medical schools showed the largest enrolment on record; there was an increase in the number of students in science departments

n general and in engineering schools. There was a reduction in nrolments in law schools and graduate schools of arts and ciences. The outbreak of war raised a number of critical issues s much for the young men and women of college age as for he administrative authorities. The former had to face the serious hoice, in so far as it rested with them, of continuing their studies r of enlisting for defense activities. The latter, particularly in rivate institutions, were confronted with the serious problem f finance caused by reductions in the student body and with he problem of adapting the educational organization to the needs f the times.

Under the selective draft system many colleges planned to ncourage students to complete their courses by making it possile for them to graduate in three instead of four years through he provision of summer courses. No general plan was adopted, ut on Dec. 16, 1941 a number of eastern colleges (Yale, Harard, Dartmouth and Princeton) announced that students would e permitted to graduate in three years by taking courses in ummer, a practice announced earlier by Columbia. State uniersities have always provided undergraduate courses in their ummer sessions. It was not clear at the close of 1941 what the ffect would be of lowering the age for registration to 18.

On this issue President Roosevelt suggested a principle which night serve as a guide under war conditions as it did in the mergency period, when he sent his message to be read at a neeting of the American College Publicity association. "The nessage I would emphasize to you this year," wrote the President, is that America will always need men and women of college raining. Government and industry alike need skilled technicians oday. Later we shall need men and women of broad undertanding and special aptitudes to serve as leaders of the generaion which must manage the postwar world. We must, therefore, edouble our efforts during these critical times to make our chools and colleges render ever more efficient service in support f our cherished democratic institutions." The president thus ombined both the immediate and the long-term issues to be aced.

The other effect of a possible reduction in enrolments would be o aggravate a condition with which private institutions for higher ducation had already been concerned during the depression eriod. Financial contributions had fallen considerably, returns rom endowments had dropped and endowments themselves had egun to shrink. Faced by a further threat of decrease in income hrough decreased enrolments, these institutions might be comelled to increase the cost of education to students and to allow tandards of instruction, salaries and equipment to be lowered, vith serious consequences to the provision of educational opporunities.

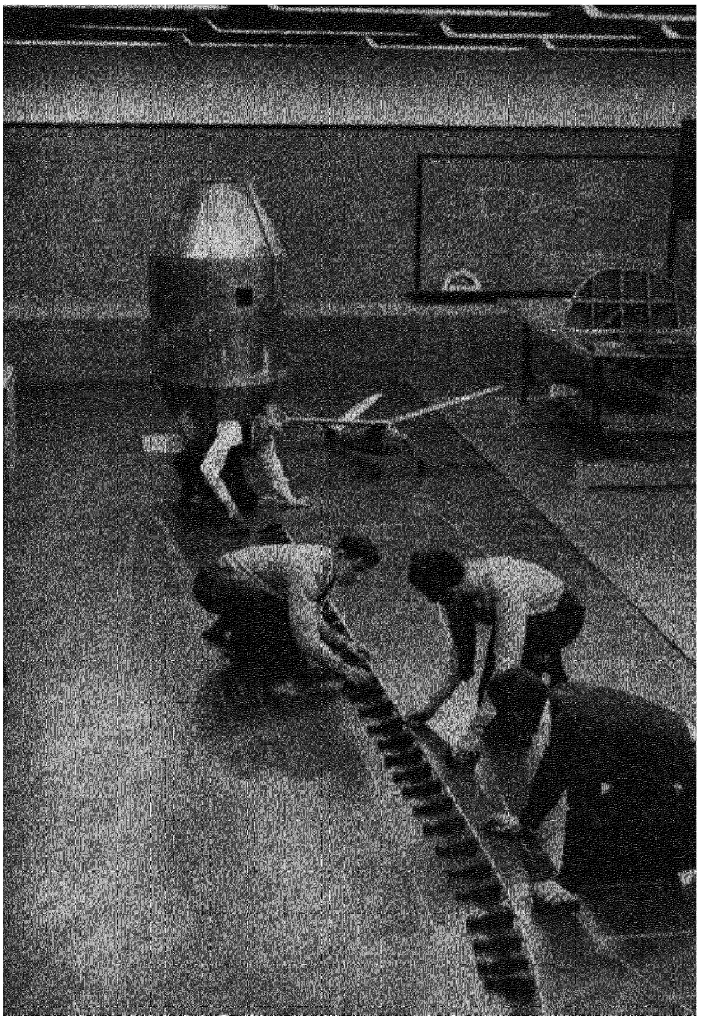
One example alone may be cited by way of illustration. In 940–41, according to an article by A. Calvert Smith on "Harard's Financial Problems: The Threat of Falling Income in Our Universities" (in the *Harvard Alumni Bulletin,* Nov. 1, 941), Harvard derived about 30% of its income from student ees; at the beginning of the academic year, 1941–42, there was 10% overall decline in enrolment (mainly due to the decrease f students in the graduate school and school of law). Slightly nore than 41% of the income comes from invested funds and 3% from gifts and other receipts, both sources dependent on he financial situation of the United States. These conditions eriously threatened the future of salaries (which had weathered he depression without reduction), of scholarships, retiring allownces, maintenance, services and wages. Should financial considerations compel serious reductions here, "the loss (in educational standing) may be far more serious than any budgetary setback."

This statement applied to all endowed institutions. Up to Jan. 1, 1942 endowments seemed to have been administered with great care and skill. The American Council on Education reported during the year that 120 institutions earned 4.06% on their funds in 1940–41 with an expectation of 3.86% in 1941–42. The total amount of funds involved in this report was $1,263,653,000 or 75% of all the endowed funds held by institutions of higher education.

One suggested solution of this financial problem—that aid be secured from state or federal sources—was not received with much enthusiasm. It was viewed with concern because of a desire to safeguard the independence of private institutions and fear of political control or interference, which caused some institutions to reject student aid under the National Youth administration.

There was actually an increase in the number of colleges and similar institutions in 1940–41. According to the *Educational Directory* published in May 1941 by the U.S. Office of Education, there were 29 more institutions of higher education in 1941 than in 1937. The increase was not wholly due to the creation of new institutions but to a reclassification of existing institutions. The total distribution for 1941 was as follows: (the figures for 1937 are given in parentheses for purposes of comparison) colleges and universities 744 (714); professional schools 270 (267); teachers' colleges 190 (173); normal schools 54 (82); junior colleges 462 (468). (For a listing of institutions *see* UNIVERSITIES AND COLLEGES.)

Anniversaries.—While new institutions of higher education were being established older institutions celebrated their anni-

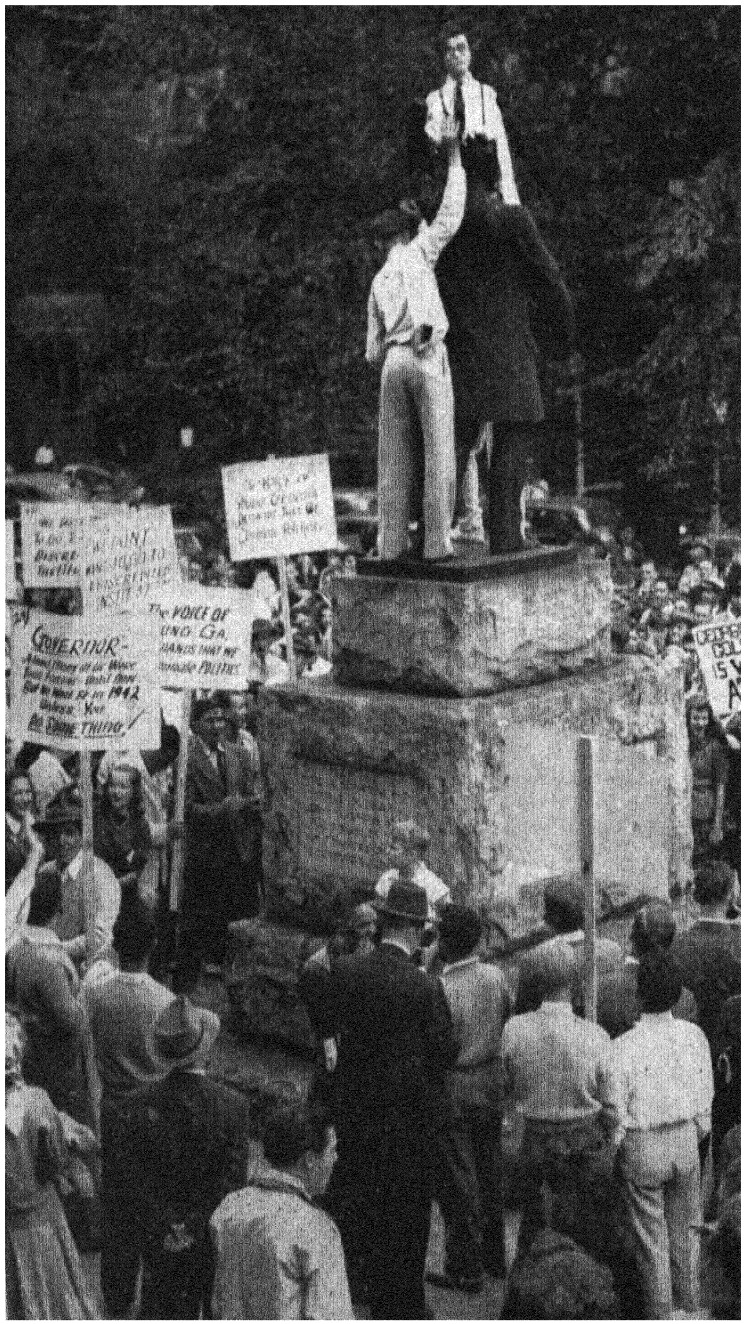


TUDENTS at Burgard high school in Buffalo, N.Y. learning the principles of erodynamics. This school, like many others throughout the U.S.A., was open ay and night in 1941 to prepare boys and men for defense jobs

versaries: Stanford university and the University of Chicago their 50th; Lehigh university and Fisk university their 75th; Fordham university and the University of Michigan their 100th; the University of Vermont its 150th; and Rutgers university its 175th.

Student Aid.—Figures were available on the amount of aid for students in high schools, colleges and universities in the form of scholarships, loans and wages for part-time work. The U.S. Office of Education in its report on *Financial Aids for College Students* announced that in 1937–38 a total of $51,255,145 was devoted by 1,387 institutions to the aid of students, of which 41% was distributed in the form of scholarships, 11% in loans and 48% as wages for part-time employment. The total included a contribution of $9,779,459 from the National Youth administration. The largest sum ($17,747,465) was distributed by private institutions, closely followed by state institutions which spent $17,676,532. Institutions under Protestant control provided $10,289,333; Roman Catholic institutions $2,956,408; and municipal institutions, chiefly junior colleges, $1,585,407. The most usual type of aid was through the provision of part-time employment, while the largest amount of aid in private institutions was through scholarships.

The National Youth administration allocated $21,088,125 for 1941–42 in the 48 states, District of Columbia, New York city, Alaska, Hawaii, Puerto Rico and the Virgin Islands. Students in high schools were allocated $10,039,050 and students in colleges and universities $11,049,075. In states where no facilities were available for Negro college and graduate students an additional sum of $85,000 was assigned. New York city alone was given the sum of $1,210,710 to aid about 15,000 high school and 5,000 college and university students. (See *School Life* and *School and Society*.)



STUDENTS of the University of Georgia held a mass protest meeting before an effigy of Gov. Eugene Talmadge Oct. 15, 1941 at Atlanta, after the governor's dismissal of two faculty members had resulted in the university's expulsion from the Southern University conference, on charges of violating academic freedom

Federal Government and Education.—For the fiscal year ending June 30, 1942, the federal government appropriated $713,985,000 for the following educational purposes created by the emergency situation: programs of the U.S. Office of Education, R.O.T.C. classes in colleges, civilian pilot training, Indian schools, training for merchant marine, apprentice training, WPA education, alien education, school construction in "boom towns," agriculture and home economics extension work, agricultural experiment stations, Civilian Conservation corps and National Youth administration.

The movement for more federal aid to meet permanent conditions continued. In the first session of the 77th congress of the house of representatives 122 bills, dealing with various aspects of education, were introduced. In the senate the most important bill (S. 1313) was that introduced by Senator Elbert Thomas to appropriate $300,000,000 to the states in order to equalize educational opportunities for both white and Negro children, and to provide schools for children of defense and migratory workers and those living on federal reservations. The basis for apportionment of funds was financial ability of the states, the number of children, and the need of additional public school facilities, leaving to states and localities initiative in the organization and administration of schools, in curriculum and methods, and in the selection of personnel.

While the need of increased participation of the federal government in education was generally recognized, the question of control was an important subject of debate. The growing participation of federal authorities in educational activities arising out of the depression which had led to the creation of new authorities like the National Youth administration and the Civilian Conservation corps, had already given rise to conflicts, which were only increased with the rising need of training defense workers. The issues were summarized in a pamphlet, *The Civilian Conservation Corps, the National Youth Administration and the Public Schools*, published by the Educational Policies commission of the National Education association in Oct. 1941.

Two questions were raised in this pamphlet: (1) Should the federal government operate and control educational programs, if state and local agencies cannot do so unaided? Or (2) should the federal government operate through state and local agencies, providing financial aid and leadership but leaving the control over the processes of education to the state and local agencies? Fear was expressed that the second principle followed from 1785 to 1933 had been abandoned when the NYA and CCC extended their functions and entered directly into the field of training and education beyond their original purpose of providing relief, work and employment. The new practice resulted in two systems of vocational training and education of unemployed out-of-school youth, one under federal control and the other under state and local agencies. The report urged the need of a consistent policy to avoid the danger of centralized national control in education. An extension of federal control would result in dual systems of administration, in a division of the educational care of youth be-

tween two authorities, and a class organization of education—one for youth able to remain in school until ready for employment and another for those no longer in school.

The American tradition of decentralization had encouraged greater flexibility, experimentation and progress when state and local agencies had full control and responsibility in education of all kinds. The federal government should refrain from exercising control and, while providing aid to equalize opportunities, should supply leadership through research, experimentation and demonstration to stimulate local efforts. The NYA and CCC should, according to the Educational Policies commission, be discontinued, their functions as agencies for vocational training, general education and guidance should be transferred to state and local agencies, and their functions as public works agencies should be assigned to the appropriate agencies in this field. A clear definition of policy on the relations between federal, state and local authorities was demanded in accordance with American tradition and efficient service in the interests of the education of youth. The recommendations made by the Educational Policies commission had already been stated earlier in the year by the National Committee on Education and Defense. This committee expressed its opposition to the duplication of existing educational facilities by federal agencies and the adaptation and expansion of regular educational agencies to meet the needs of the times to serve all youth according to their needs.

The only action taken in this matter was the adoption by the National Advisory committee of a suggestion made by President Roosevelt that the NYA and CCC be merged and that the services performed by them be continued and maintained. It was estimated that such a merger would mean a saving of $130,000,000.

National Citizenship Education Program.—During 1941 the federal government undertook another educational program. The need for this emerged from the discovery that according to the registration conducted in 1940 by the department of justice there were nearly 5,000,000 aliens in the country of whom about one in six could not write. Under the sponsorship of the immigration and naturalization service of the department of justice a national citizenship education program was instituted, financed by $14,000,000 WPA funds. Facilities were to be provided through the immigration and naturalization service and state and local boards of education to prepare applicants for naturalization and for the duties and responsibilities of citizenship. Classes in citizenship for the foreign-born were to be organized; materials, lesson-plans and other aids for such classes were to be prepared; teachers were to be trained; and financial aid was to be given to all agencies interested in giving the foreign-born a better understanding of English and of the principles of the American form of government. Funds were allocated to state councils to organize classes and teacher-training programs; technical and expert service was provided; and the results of research would be made available. The National Citizenship Education program was under the direction of Dean William F. Russell, on leave of absence from Teachers college, Columbia university, with an office in the U.S. Office of Education.

Adult Education.—The selective draft under which 1,000,000 men a year were to be brought together for defense training brought with it the realization that education and recreation would have to be organized as part of a general scheme to maintain morale. The secretary of war appointed a war department advisory committee on education, recreation and social welfare to draw up a program to meet the new needs. It was proposed that any scheme which might be adopted should be under army administration and army instructors with such additional assistance as might be found to be necessary. It was recognized that provision would have to be made for three levels: (1) an upper level, about 25% of the total, of men of two or three years of high school experience or college experience; (2) a median level represented by about 45% who had completed the eighth grade; and (3) a lower level consisting of men of two, three or four, or no years of schooling, about 30% of the total. A variety of educational-recreational activities was planned including motion pictures, radio, drama, listening groups, discussion groups, library service, lectures, workshops and organized instruction through correspondence courses of class work. Toward the end of the year it was announced that correspondence instruction would be provided free except for a $2 registration fee, through the International Correspondence school or other courses which might be developed, and that the army would pay half the cost of tuition and textbooks, up to $20, for each man electing courses offered by colleges and universities. The situation changed at the close of the year, but with the examples of the British and Canadian armies new plans were expected to be further developed.

At the opening of the academic year the offices of the American Association for Adult Education were moved to Teachers college, Columbia university, when the director of the association, Dr. Morse Cartwright, became the executive officer of the Institute for Adult Education. The association discontinued its emergency program for defense, and the publication of *Defense Papers, Defense Digests* and *Community Councils in Action* was ended. The series of *Studies in the Social Significance of Adult Education in the United States* was completed with the publication of the 27th volume. The Institute for Adult Education was established at Teachers college through a grant of $350,000 from the Carnegie Corporation of New York which had provided funds for the maintenance of the association since 1925. The institute was to be devoted to an intensive study of the opportunities, problems, materials and methods of adult education and the training of leaders and workers in the field. The association would be continued and would publish *The Adult Education Journal* as its membership organ in place of the *Journal of Adult Education*.

Progressive Education.—An informal committee appointed by the Progressive Education association issued a pamphlet (Bureau of Publications, Teachers college, Columbia university) under the title *New Methods vs. Old in American Education*. The pamphlet, a report on evaluation of newer practices in education, presented an analysis and summary of recent comparative studies. In the Summary of the Evidence the conclusion offered is that "the major researches show, in general, that where schools have adopted newer educational practices the children learn as much of the ordinary subjects as they would otherwise have learned. Sometimes they learn slightly less and sometimes slightly more, but the differences are small." The children in these schools "seem to be better adjusted both to their work and to social life when they graduate to other schools or to college." There is no loss in academic efficiency but "there is a definite gain in terms of initiative, skill in dealing with problems, knowledge of contemporary and world affairs, and social participation."

Similar conclusions were reached by the New York state department of education in its report of a survey of the activity program in New York city. Here it was also stated that "the balance in favour of the activity program is small" but might be increased "through improving the theory and practice of the activity program." The pupils tend, according to the report, to excel in co-operativeness, self-confidence, lack of subservience, creative abilities, self-discipline and scientific outlook. The state department recommended the extension of the activity program in the schools of New York city on a voluntary basis.

Critics of these reports continued to be skeptical about the methods of evaluation, while others did not feel that the small differences between the results of new and old methods were sufficiently compensated for by such blanket terms as initiative, resourcefulness, scientific outlook and so on.

Latin-American Relations.—The year saw a rapid extension of the interest in Latin-American relations under the leadership in particular of the U.S. Department of State's Division of Cultural Relations and the Office of Coordinator of Inter-American Affairs in the Office of Emergency Management (the original title of Office of the Coordinator of Commercial and Cultural Relations between the American Republics having been changed by executive order of July 30, 1941). The Division of Cultural Relations administered travel grants to distinguished leaders in the fields of education, literature, journalism, music, medicine, archaeology, art, etc., co-operated with private, professional and scientific organizations in developing inter-American activities; stimulated the interchange of educational motion pictures; and co-operated with the Office of the Coordinator.

On the educational side the Office of the Coordinator was concerned with the development of programs in the arts and sciences, education and travel, radio, press and moving pictures and operated through public and private organizations interested in strengthening hemisphere solidarity. In collaboration with the U.S. Office of Education the office was preparing materials and travel exhibits of aids to stimulate the teaching of Latin-American relations. It also undertook the preparation of new books, guides and bibliographies, the development of archaeological studies, the distribution of examples of American art, the support of cultural institutes in South America, and the establishment of an inter-American music centre. It was also interested in the use of radio, news, motion pictures and sports, and in co-operation in the fields of health, child welfare, social legislation and allied subjects.

The Institute of International Education in New York city, co-operating with these and other organizations in the U.S. and in South America, was active in arranging for the exchange of professors and students and in disseminating information on summer session and other courses. The institute administers the award of 20 Roosevelt fellowships each year.

Courses in inter-American relations were established in increasing numbers in high schools, colleges and universities throughout the United States, and in some institutions special Latin-American weeks were organized. One important result of these activities was the increase in the number of students taking up the study of Spanish and Portuguese.

In November, a conference of the American National Committees on Intellectual Cooperation was held in Havana and provided an opportunity for the exchange of views and expressions of solidarity in the interests of intellectual freedom.

Academic Freedom.—The *cause célèbre* of 1941 in the field of academic freedom and tenure was provided by Governor Eugene Talmadge in an attempt to seize political control over the system of higher education in Georgia. In June 1941, the governor announced the dismissal of Dr. W. D. Cocking, dean of the school of education of the University of Georgia, and of Dr. Marvin S. Pittman, president of the Statesboro Teachers college, on the charge of advocating co-racial education of whites and Negroes. President Harmon W. Caldwell of the university threatened to resign unless Dean Cocking was given a hearing before dismissal and was supported by the chairman of the board of regents. After a day's hearing the board of regents by one vote decided to retain Dean Cocking. The governor, insisting that he had "new evidence," demanded a second hearing and changed the membership of the board. The result was the dismissal of Dean Cocking, President Pittman and a dozen other members of the university system's faculty. Immediately the General Education board and the Rosenwald fund withdrew their financial support from the university; the Southern Association of Colleges and Secondary schools withdrew inter-

collegiate recognition of Georgia's degrees and credits; and the two leading institutions for higher education in the state were dropped from the Southern conference and the Association of American Universities. The American Association of University Professors was requested to investigate the situation. The pressure of these organizations and public indignation (90% of the daily and weekly, metropolitan and rural press was opposed to the governor's attempt to secure political control and introduce the spoils system in education) compelled Governor Talmadge in November to authorize the board of regents to review the case in order to restore the university to good standing with the accrediting agencies. (See *Bulletin of the American Association of University Professors*, Oct. 1941, pp. 466 ff., and *School and Society*.)

The revised statement drafted at the joint conferences of the Commission on Academic Freedom and Academic Tenure with the officers of the American Association of University Professors was endorsed by the Association of American Colleges at its annual meeting in Pasadena, Jan. 10, 1941. The statement of principles was based on the thesis that "the common good depends upon the free search for truth and its free exposition." Academic freedom includes both freedom in teaching and research and freedom in learning. "It carries with it duties correlative with rights." While entitled to freedom in the classroom to discuss his subject, the teacher should be careful not to introduce controversial matter which has no relation to it. "Limitations of academic freedom because of religious or other aims of the institution should be clearly stated in writing at the time of appointment." The teacher's special position in his community imposes special obligations, and, remembering that the public may judge his profession and his institution by his utterances, he "should make every effort to indicate that he is not an institutional spokesman."

On the subject of academic tenure the commission recommended permanent or continuous tenure after a probationary period of not more than seven years after appointment to the rank of a full-time instructor or higher rank. Notice of at least one year should be given prior to the expiration of the probationary period, if appointment is not to be continued. After permanent appointment, services should be terminated only for cause and after due hearing of charges. (See *Association of American Colleges Bulletin*, March 1941, pp. 124 f., and 127 ff.)

During 1941 the American Association of University Professors had 112 cases involving academic tenure referred to it, including the Western Washington College of Education, the University of Kansas City and Adelphi college.

At its annual meeting the American Federation of Teachers decided after a vote of its members to withdraw the charters of two local unions in New York city and one in Philadelphia for communist activities. Action was brought in Philadelphia against the A.F.T.'s decision.

The Rapp-Coudert committee, which was appointed by the New York state legislature to investigate the costs of education in the state but which concentrated its inquiries on subversive activities of teachers in New York city, completed its work at the end of the year by revealing the existence of a very small percentage of teachers in the colleges, an "irresponsible minority" according to President Harry D. Gideonse of Brooklyn college, and schools of the city who had been members of the Communist party, and the activities of certain youth organizations under communist auspices which existed in the high schools. The committee did not investigate fascist or nazi activities in the educational system.

The investigation of 600 school textbooks in social studies initiated by the National Association of Manufacturers in 1940 was brought to a conclusion early in 1941 by the publication of a volume of abstracts which purported to present subversive doctrines. It was announced that the analysis, made under the direction of Professor Ralph W. Robey, was purely objective and without bias. Nevertheless the publication aroused a storm of protest. Fourteen members of the staff of the Harvard University Graduate School of Education issued a statement on the danger of bias and misuse of the abstracts and at the same time approved of the action of lay groups like the National Association of Manufacturers if prompted by an interest "in the improvement of education and the preservation of the democratic way of life."

Round table discussions on "subversive textbooks" were held at the annual meeting of the American Association of School administration held in Atlantic City, where the School Book Publishers association also expressed its concern on the subject. The American Association of School Administrators and the National Education association (*q.v.*) organized a National Commission on the Protection of Democracy through Education "to investigate attacks and misunderstandings and prevent attacks due to misunderstanding on the schools by explaining the purposes and programs of public education." The American Federation of Teachers urged the National Education association to "make an objective study of the charges, and of the individuals and the organizations that make them, for the guidance of citizens and educators." The National Council for the Social Studies and the American Committee for Democracy and Intellectual Freedom were among other organizations which took action on the subject. One of the clearest statements on the subject was made by Professor Erling M. Hunt, editor of *Social Education*, who pointed out that the first newspaper reports of the N.A.M. statements seemed to suggest the work of an aggressive pressure group but when read in full they "imply a far more public-spirited interest in education." The National Association of Manufacturers in the end disclaimed responsibility for Dr. Robey's remarks on the investigation. (See *School and Society*.)

Education and Democracy.—The growing emergency, resulting finally in war, sharpened the issue between the ideologies of totalitarianism and democracy which had already been the subject of widespread discussion since 1939. More than ever the serious challenge of totalitarianism to democratic ideals and ways of life was recognized. The U.S. Office of Education made two important contributions to the subject—first in a bulletin "Expressions on Education by Builders of American Democracy," a revised edition of a bulletin published in 1913, and second in pamphlet No. 15 of the Education and National Defense series, "Education under Dictatorships and in Democracies."

The literature on the meaning of democracy and its implications for education was extensive. The Educational Policies Commission of the National Education association added another to its series of publications, all of which had an important bearing on the subject. The report on *The Education of Free Men in American Democracy* emphasized the urgent need of faith in and sensitiveness to the ideals of democracy and their development and of safeguarding the interests of all against the domination of private interests and groups. Bold and resolute action was demanded to meet "the rising tide of despotism" which "threatens the cause of human freedom with catastrophe." Totalitarianism with its disciplined party and its appeals to idealism and heroism exploits the very processes and virtues of democracy by utilizing human weaknesses, undermining social solidarity and creating confusion. American democracy is challenged to promote national unity by a clear definition of policy, principle and procedure in order that a greater measure of equality of security in economic condition and opportunity may be achieved and the general welfare and long-term interests of society may be safeguarded. To these ends bold, honest and dynamic leadership must be achieved. In contrast to trends which in recent years have rejected indoctrination and discipline, the report urged that the first duty of free schools in a democracy is to indoctrinate youth with loyalty to its ideals and to disseminate the knowledge necessary for free men. To these must be added discipline, for "without discipline, loyalties, however deep and abiding, can avail but little; without discipline, knowledge, however precise and comprehensive, must remain ineffectual and sterile. . . . To the champion of authoritarian rule discipline and authority are contradictory terms." The report discussed, further, the problems of freedom and control, and the relations of government, teachers and public to education on the principle that "political control over the processes of intellectual and moral development suggests the negation of freedom."

The publication of this report was followed by the issue by the Commission of a Study-Discussion outline for study clubs, public affairs forums, teachers' meetings and councils on education and defense, and a pamphlet on "Education and the Morale of a Free People." This was followed later by the publication of another pamphlet, prepared by the Oregon Committee for Implementing the Teaching of Democracy and the Commission, under the title "Uncle Sam Is Calling the Youth of the Nation," a special edition based on *The Education of Free Men in American Democracy* "for high school juniors and seniors to further their understanding of the basic tenets of democracy and the current threats to its continuance." The Oregon committee also published study guides for teachers and leaders of professional study groups, and, in co-operation with the Oregon Department of the American Legion, a pamphlet presenting "suggestions for developing and evaluating democratic procedures in the classroom and general school organization." This series is cited as only one example of a nation-wide movement to clarify the long-term significance of education for national defense.

The urgent need of the times is illustrated by the title of a book by Dean Benjamin Floyd Pittenger, *Indoctrination for American Democracy* (New York), which with its emphasis on indoctrination carries an implication of recent educational doctrines.

General World Movements.—The character of the all-out war was clearly illustrated by its effects upon education and upon the lives of young children of school age. During World War I neither the provision nor the progress of education was unduly disrupted. In World War II, there was no country in which children had not already been deprived of the normal services of education. While there was little information about the effects of the war on education in Germany, it was known that there had been wholesale evacuation of children from areas within the range of air attacks. There was available, however, ample information on the deliberate plans of the German invaders to keep the rising generations in occupied territories in ignorance and darkness. The treatment which was being meted out by the "master-race" varies; the principle was the same. In Poland and Czechoslovakia primary education was about all that might be provided; in the other occupied countries secondary schools, universities and institutions for the training of teachers might be kept open but under teachers who were quiescent and submissive, who used new textbooks adapted to preparing the young minds for the "New Order," and who were ready to accept nazi supervision. The distinction between the two groups seemed to be made on racial lines—one treatment for the non-Aryan Slavs and another for the Nordics who might perhaps some day be brought to see the light.

The universities everywhere suffered most; in the east they were generally closed; in the north and west they were tolerated but under careful supervision. Wherever opposition was voiced by students or faculty against the dismissal of professors or appointment of pliable servants of the "New Order" they were closed. Thus the University of Leyden was closed because the students protested against the dismissal of a non-Aryan professor. In all cases university and other libraries were censored, valuable collections destroyed, and others transferred to Germany together with valuable scientific equipment. The tragedy of higher education in the occupied countries was described in a series of articles in *The Times Educational Supplement* (Feb. 15–April 12, 1941).

For the displaced scholars who went to the United States the creation of a new *École Libre des Hautes Études*, to be affiliated with the New School for Social Research in New York, was announced at the end of the year. This addition to the University in Exile was expected to open its classes for the second semester of the academic year and to represent in America the spirit of independent scholarship and research temporarily driven from Europe by "barbaric Hitlerism."

From within nazi Germany the only reports were of reaction in education. Enrolments in the universities had already fallen from 83,000 in 1928 to 43,000 in 1937, and in the secondary schools from 823,000 in 1926 to 661,000 in 1938 even before the traditional nine-year course had been reduced to eight. These reductions clearly illustrate the acceptance of nazi opposition to intellectual training. Future leaders were being trained through the *Adolf-Hitlerschulen* and the *Nationalpolitische Erziehungsanstalten* (*Napoli*). The clearest evidence, however, that the masses were to be kept in intellectual subjection was provided in the new system of preparing teachers for the elementary schools. The system introduced during the Weimar Republic which placed teacher preparation on a university

basis was discarded and replaced by one which would recruit candidates at the age of 14 from a new type of higher primary school (*Hauptschule*) and train them in small institutions for five years. This represented a return to a system against which German teachers had been protesting for 100 years. (See *Educational Forum*, Nov. 1941, pp. 69 ff., and G. Ziemer, *Education for Death*, Oxford University press.)

Education in occupied France was disrupted just as in other occupied countries, while in unoccupied France the forces of reaction seized upon the educational system to develop new loyalties to the new state. Religious instruction was restored; denominational teaching orders were permitted to return; an end was put to the common school (*école unique*) movement which held out a promise of increased educational opportunities; women were dismissed from teaching positions; textbooks were being revised in the interests of collaboration; the normal schools, regarded as seed-beds of revolutionary movements, were closed and replaced by a system of teacher training likely to draw candidates from a more politically reliable stratum in society; and teachers' associations were abolished in favour of a single organization more amenable to control. Finally, more attention was being devoted to physical education. (See *School and Society*.)

England presented a far more encouraging picture. After the comparative failure of the evacuation schemes, the full machinery of the scheme was again brought under control. Special care was devoted to the health of children by additional funds for the provision of meals and especially milk, through the school medical services with special inspection of children reported as suffering from war strain, and through the organization of increased day nurseries and nursery schools both in reception areas and near munitions factories where mothers were employed. As in World War I, new educational adaptations and experiments were being tried out. Above all was the universal recognition of the "wonderful services rendered by the teachers at times of acute crisis and danger," to quote a former president of the board of education, in addition to the heavy burden of school work under difficult conditions—civil defense work, auxiliary fire service, home guard, canteens and rest centres, billeting of pupils, provision of clothing and work with out-of-school youth.

In March 1941, the estimates of the national board of education in Great Britain for the ensuing year showed an increase of £2,250,666 over 1940 (£54,915,639 for 1941 as compared with £52,664,973 for 1940).

The universities were the greatest sufferers; faculties were drawn off for public services; student interests were shifted; and finally changes in the draft age might prevent students of university age from spending even one or two years in the universities. (*See* also CAMBRIDGE UNIVERSITY; LONDON UNIVERSITY; OXFORD UNIVERSITY.)

Initiated in 1939–40 the "Service of Youth" spread throughout Great Britain to organize and satisfy the interests of out-of-school youth through a combination of voluntary and public initiative and effort. Working under a National Youth committee and co-operating with the board of education and local education authorities, youth committees were everywhere established to promote social, recreational and educational activities for youth, but on a voluntary basis and without any effort at uniformity and regimentation.

For soldiers in the army an extensive system of adult education was organized under an Army Educational corps with a full-time civilian director and staff. In each unit an army officer was designated as the unit education officer whose business it was to discover and meet the demands, which so far showed an interest in foreign languages, sciences, economics, architecture, engineering and history. Since there was a widespread interest in current affairs, lectures were organized in this field and were given during the regular hours of training.

The problems of education in the postwar period were not ignored. Books and articles already appeared on the subject; the number of groups and committees studying it was extensive. The general lines of future development included increased provision of nursery schools; extension of compulsory full-time education at least to 15 and part-time to 18; a redefinition of secondary education; changes in the grant system and in educational authorities; the incorporation of the Youth service in the general system; and greater extension of educational opportunity up to the university. One important innovation was launched; there was a widespread movement to give instruction in the history of the United States in all schools. (See *The Times Educational Supplement; The Schoolmaster and Woman Teacher's Chronicle;* and *The Journal of Education.*)

(I. L. K.)

Education Association, National: *see* NATIONAL EDUCATION ASSOCIATION.

Edwards, Agustín (1878–1941), Chilean statesman and publisher, was born June 17 in Santiago, Chile. A descendant of a British naval officer and member of a prominent Chilean family, Edwards became minister of foreign affairs in Chile at the age of 25. He held this post from 1903 to 1910. He subsequently was minister to Italy, Spain and Switzerland, 1905–06; to Great Britain, 1910–25; and he was ambassador to Great Britain, 1935–38. He was elected vice-president of the League of Nations assembly in 1921, president in 1922 and he served as president of the league council in 1936. Edwards was a member of the Chilean parliament from 1900 to 1910 and was vice-president of the chamber of deputies from 1901 to 1902. He was also publisher of a number of Chilean newspapers and magazines as well as president of the banking house of Edwards and company. He died at his home in Santiago, June 18.

Eggs. Wartime demand and the United States government's activity in stimulating increased production of food for defense and in buying eggs for shipment to Great Britain resulted in a new record production of eggs in the United States in 1941. Production for the year was estimated by the department of agriculture as 40,712,000,000 eggs—5% more than in 1940, 12% more than the ten-year average production, and 4% more than the previous record year of 1930, when there were approximately 1% more laying hens on farms than in 1941. Egg prices began the year below average, but under the stimulus of government buying for export, prices rose from a low of 15¾ cents per doz., in the Chicago Mercantile Exchange wholesale market in Feb. 1941, to the highest price since 1929. By early Nov. 1941, the Surplus Marketing administration was paying as high as 39¾ cents per doz. for fresh eggs to export to Britain. In the government's effort to induce increased production of concentrated foods for export, the output of dried eggs in the United States in 1941 was estimated at about 40,000,000 lb., about four times the previous highest production, that of 1939. (For exports of eggs under provisions of the Lend-Lease act, see FARM INCOME.) During 1941, up to Dec. 20, the government bought the equivalent of 7,750,000 cases of eggs (30 doz. eggs to the case). Trading on the country's largest futures market in eggs, the Chicago Mercantile Exchange, was the largest in volume since 1925 and totalled 54,530 trading units, or cars, amounting to 654,360,000 doz. In Sept. 1941, the secretary of agriculture announced that the government would support egg prices at not less than 85% of parity through Dec. 31, 1942. At the opening of the market Dec. 8, following the attack on Pearl Harbor, the Chicago Mercantile Exchange for the first time in many years clamped price restrictions on trading in eggs and limited the maximum variation in prices to two cents a doz. in any one day. This action was to prevent excessive speculation and anticipated the wartime control policies of the U.S. Commodity Exchange administration in maintaining stable markets for commodities important to defense. The price restrictions were apparently necessary for only three days.

For many years imports of dried eggs from China had been the source of much complaint from United States egg producers. That competition practically disappeared in 1941. Imports from South America, however, caused some concern among producers. These imports were reported by the trade at about 310,000 cases; partly from Brazil but mainly from Argentina. The U.S. department of agriculture asked, in Sept. 1941, for a production of 4,000,000,000 doz. eggs in 1942, but later raised this figure to 4,200,000,000 doz. (*See* also POULTRY.) (S. O. R.)

Egypt. An independent kingdom of northeast Africa; bounded N. by the Mediterranean, S. by the Anglo-Egyptian Sudan, N.E. by Palestine, E. by the Red sea, W. by Libya and the Sahara. Area *c.* 383,000 sq.mi. (arable land 13,600 sq.mi.); pop. (June 30, 1939), 16,522,000. Chief towns (pop. 1937): Cairo (cap., 1,307,422); Alexandria (682,101); Port Said (126,907); Tanta (94,421); Mansura (68,637); Damanhur (61,791); Asyut (59,925). Ruler, King Farouk I; premier, Hussein Sirri Pasha; language, Arabic; religion, Mohammedan 91%, Copt 7%.

History.—When the year 1941 opened, the Italian forces which had advanced into Egypt had already been ejected from Egyptian territory as the result of the British offensive begun at Sidi Barrani early in December. With the fall of Bardia early in January and of Bengasi on Feb. 6, military threats to Egypt seemed definitely to have been removed. But German troops appeared in North Africa and were encountered at Agheila, south of Bengasi, as early as the end of February. Their strength proved too great for the British forces available; Bengasi had to be abandoned early in April and by the end of that month the enemy

was back on Egyptian soil at El Sollum. No further advance however, was made, and with Tobruk remaining in British hands the position was stabilized. Then, with the second British attack on Libya launched Nov. 18, the threat of invasion to Egypt appeared quite remote at the end of 1941. However, the capture of Crete at the end of May made it easier for the enemy to launch air attacks upon Egypt. Comparatively innocuous air raids in January and February gave place in June to two heavy raids on Alexandria in which upwards of 500 casualties were reported; in August there were raids on the Suez canal area in which casualties were also substantial; and in September a raid was made on the outskirts of Cairo. Up to the end of the year the city itself had not been attacked. After the raids on Alexandria the prime minister, Hussein Sirri Pasha, announced a gift by the British government of £E1,000,000 to be spent on improving air-raid precaution measures in Cairo, Alexandria and other towns. In May the Egyptian steamer "Zamzam" was sunk by a German raider, which, however, took off the passengers and crew.

The operations in Syria which led to the overthrow of the Vichy regime there and to the removal of German and Italian influence, and in a less degree the operations in Iraq, had far-reaching effects on Egypt, because they rendered secure its eastern frontier, the threat to which was becoming apparent.

In domestic politics, attempts were made to form a government on a national basis by including in the cabinet members of the parties in opposition, but the efforts were not entirely successful, as it was not possible to overcome the objections of the Wafdist party. Nevertheless at the end of July Hussein Sirri Pasha formed a new government which included members of the Saadist party under the leadership of Ahmed Maher Pasha, who had been unwilling to join the cabinet earlier in the year because he thought that more active participation in the war was the right policy for Egypt to pursue. Foreign commercial interests in Egypt felt some alarm at what they considered to be hostility to the foreign community in certain measures taken by the chamber of deputies. Among these were proposals to oblige firms to keep accounts in Arabic and to maintain a fixed proportion of Egyptian employees on their staffs. The prime minister in the chamber emphasized that there was no hostility to the foreign community on the part of the government, but pointed out that Egyptians must be free to establish their own position in the commercial arena. At the close of the year the measures which gave rise to these remarks were being reconsidered by the government. Advantage was taken of Anthony Eden's visit to Egypt in March to discuss topics of mutual interest to Great Britain and Egypt. In August the prime minister announced that an agreement had been made with the British government whereby the British and Egyptian governments would buy the cotton crop at the same prices as the British government had paid in 1940.

In February Robert Menzies, prime minister of Australia, was welcomed at a press meeting as being the first dominion prime minister who had ever visited Egypt. (B. H. B.)

Education.—(1938–39): Elementary and secondary schools 4,065; scholars 1,064,209; colleges 8; scholars 1,980; Fuad I university: scholars, male 8,393; female 7,043; foreign schools (1936–37) 410; scholars 76,750.

Banking and Finance.—Revenue (est. 1940–41) £E47,718,000; expenditure (est. 1940–41) £E45,818,000; public debt (May 1, 1939) £E94,614,360; reserve from budget surpluses £E33,062,569; notes in circulation (March 31, 1941) £E37,500,000; gold reserve (March 1941) £E6,300,000; foreign assets reserve £E32,900,000; exchange rate (£E1=100 piastres): (average 1940) £E1=393.2 cents; July 1941: £E1=414.1 cents.

Trade and Communication.—External trade (merchandise): imports (1938) £E36,954,373; (1939) £E34,091,716: exports (1938) £E29,342,485; (1939) £E34,080,913. Communications and transport, 1938: roads, main 1,240 mi.; secondary 3,430 mi.; railways, state 3,537 mi.; agricultural 876 mi.; shipping (1939) 110,000 tons gross; entered ports 35,390,325 tons gross; passed through Suez canal 25,827,977 tons gross; motor vehicles licensed (Dec. 31, 1938): cars 29,382; commercial 4,074; cycles 2,051; wireless receiving set licences (Dec. 31, 1938) 78,823; telephone instruments in use (April 30, 1938) 59,922.

Aerial Navigation in Egypt (1938)

	Misr Airways Company	Imperial Airways Ltd.	"K.L.M." Royal Dutch Air Lines
Passengers	18,559	6,056	2,450
Freight and baggage (Kg.)	63,828	114,189	45,140
Mails (Kg.)	16,435	1,482,130	131,851
Miles flown	1,011,104	6,967,935	2,795,180
Regularity of service	98.1%	90.9%	98.2%

Agriculture and Minerals.—Production 1939 (in metric tons): cotton, ginned 390,500; maize 1,522,300; wheat 1,333,800; rice 887,800; petroleum 666,000; natural phosphates 547,000; cane sugar, refined 159,800; barley 238,200; ground-nuts 16,600. (*See* also ANGLO-EGYPTIAN SUDAN.)

Eidmann, Frank Lewis (1887–1941), U.S. educator, was a leader in automotive and aviation engineering. Born Dec. 20 in Kingston, N.Y., he studied mechanical engineering at the Stevens Institute of Technology, where, after graduating in 1909, he worked in the institute's laboratories. He was associate professor at Princeton university, 1923–30, and was professor of mechanical engineering at Columbia from 1931 until his death. Prof. Eidmann designed parts for some of the first farm tractors made in the U.S. In later years he specialized in design and construction of timing devices. He died in New York city, Sept. 4.

Eire. Eire is the southern portion of an island to the west of Great Britain, extending from 51°26′ to 51°21′ N., and from 5°25′ to 10°30′ W. Under the constitution, operative since Dec. 29, 1937, the name "Irish Free State," given by the treaty of 1921 to the 26 counties and four of the county boroughs of southern Ireland, was replaced by that of "Eire," or Ireland. President: Dr. Douglas Hyde (*de h-Ide*). National flag: the tricolour of green, white and orange.

Area and Population.—Area 26,601 sq.mi.; pop. (est. June 30, 1939) 2,934,000. Chief towns (pop. census 1936): Dublin (cap., est. 1939, 482,300); Cork (80,765); Limerick (41,061); Dun Laoghaire (est. 1939, 40,600); Waterford (27,968). Languages: Irish and English; religion: Christian (Roman Catholic 93%).

History.—On Nov. 7, 1940, Prime Minister Eamon de Valera stated in the Dáil that it was his policy to promote good relations with Great Britain. In no circumstances would he allow Eire to be used as a base for attack on that country. He categorically denied reports that submarines were being fuelled or provisioned from Irish coasts. There could be no question of the ports being handed over as long as Eire remained neutral, and attempts by either side to put pressure on Eire would lead only to bloodshed. In his Christmas eve 1940 broadcast to the Irish in the U.S.A. the Taoiseach spoke of a publicity campaign in America for the seizure of the Irish ports, and said that any attack would be met by force. He asked U.S. help to procure weapons and food. On Jan. 17, 1941, Sean F. Lemass announced that nine ships under the Irish flag had recently been sunk off the coast. On March 8, Frank Aiken flew to the U.S.A. to purchase arms and supplies, returning at the end of June. During Aiken's visit President Roosevelt gave permission for the purchase of two ships. Five others were bought afterward and an Irish shipping company formed. Later President Roosevelt said that no munitions would be supplied except to active belligerents.

On July 17, James Dillon in the Dáil called for the abandonment of neutrality and co-operation with Britain and the U.S.A., but his plea was repudiated by his own leader.

A special session of the Dáil was called on May 26 to discuss the proposed introduction of conscription in Northern Ireland. De Valera, with whom other leaders agreed, said that the proposed step would undo the goodwill prevailing between Eire and Great Britain. Though his interference was denounced by John M. Andrews, the proposal was dropped, Prime Minister Churchill hav-

ing declared that it would not be worth the trouble it would cause.

Serious damage was done in Dublin by bombs dropped near Clontarf from a German plane on May 31. Thirty-four people were killed and more than 80 were badly wounded.

Owing to the shortage of imported supplies, tea, cocoa, coal, gasoline and paraffin products were severely rationed and the extraction-percentage in flour was raised to 95. Strenuous efforts raised food production to the greatest recorded volume, and resulted in the largest wheat crop since 1846, but a protracted outbreak of foot-and-mouth disease greatly hampered the livestock trade. (M. T.)

Education.—In 1939–40: elementary schools, 5,114; scholars, 464,108; secondary schools, 345; scholars, 37,670; universities: National, 3,987 students; Trinity college, Dublin, 1,438.

Banking and Finance.—Revenue, ordinary (1940–41), £34,638,000; (est. 1941–42) £36,264,000; expenditure, ordinary (1940–41), £37,772,030; (est. 1941–42) £40,172,000; public debt (March 31, 1941), £48,243,173; notes in circulation (Aug. 10, 1940), £18,980,262; gold bullion (March 31, 1941), £2,601,685; reserve, British bank securities (March 31, 1941), £10,121,265; exchange rate (1941), £1 = about $4.03.

Trade and Communication.—Foreign trade (merchandise): imports (1940), £46,790,207; exports and re-exports (1940), £32,966,406; roads, main (1938–39), 10,000 mi.; secondary, 38,000 mi.; railways, total track mileage (1940), 2,493 mi.; shipping (1940): vessels, 532; net tonnage, 30,253; motor vehicles licensed (Aug. 1941): private cars, 31,780; other vehicles, 24,128; wireless receiving set licences (1939–40), 169,622; telephones, installations (1939–40), 27,387.

Agriculture, Manufacturing, Mineral Production.—Production 1940 (in metric tons): oats, 736,000; wheat, 317,900; potatoes, 3,168,200; barley, 141,100; beet sugar, 94,000; coal (1939), 120,000; wool (1940), 7,586. Agriculture and fisheries, net output (1939–40), £51,800,000; industry, net output (1939), £27,121,000. Number of insured workers (1939–40), average, 432,127; number of unemployed, average, 84,054.

Industrial Production Census in Eire (preliminary figures) 1939

Industry or Trade	Gross output £	Net output £	Persons employed
Bacon curing	6,556,636	926,279	2,543
Boots and shoes	2,024,145	938,086	5,644
Brewing	7,923,440	6,646,033	3,759
Hosiery	1,305,986	649,522	5,025
Shirt making	468,242	209,066	2,154
Sugar and confectionery	4,210,252	1,670,281	4,917
Textiles	3,117,488	1,113,350	6,699
Tobacco	7,676,129	1,515,231	2,449
Vehicles	2,090,736	898,341	3,505

NOTE: Industrial output in 1939 related to the 35 industrial groups which comprise all descriptions of "transportable goods." It excludes all particulars in respect of laundry, dyeing and cleaning, building and construction, utilities (gas, water and electricity), work carried out by transport companies (canals, docks, harbours and railways) or by local authorities and government departments. It also excludes the output of very small industrial concerns included in figures for previous years.

Elections.

Although 1941 was an off year for elections, it was not without political activity or interest. Neither in the elections regularly scheduled nor in those specially called to fill vacancies in the two houses of congress was there clear evidence of any significant party trend in politics. But factional conflicts were lively and in several instances local attitudes toward the world situation were reflected.

The unfinished business of Missouri's contested 1940 election was closed on May 21, 1941, by the state assembly's recognition of Forrest C. Donnell (Republican) as governor. A somewhat different type of contest had meanwhile developed in West Virginia, where the retiring Governor Homer A. Holt and the incoming Governor Matthew M. Neely both claimed the right to name a successor to the latter's unexpired term in the United States senate. Governor Holt, on Jan. 12, the last day of his administration, designated Clarence E. Martin to become senator "upon the occurrence of a vacancy." Neely countered this move by withholding his resignation from the senate until 12:01 A.M., Jan. 13, having himself sworn in immediately afterward, and then promptly appointing Joseph Rosier. The legal and political implications of this case furnished the subject of a three-day debate in the senate, which finally decided by a close vote in Rosier's favour.

The only regular election of 1941 to arouse much national interest was that for mayor of New York city. Early in the spring it became apparent that Mayor Fiorello La Guardia, in spite of previous indications to the contrary, would not be averse to a third term if he were solicited by a sufficient number of voters. Movements accordingly got under way to "draft" him as a candidate on the Fusion, American Labor and Republican tickets. A proposal of some New Dealers to enter his name in the Democratic primary was dropped at his own desire, since it was felt that if he were not opposed the independent voters would fail to turn out in sufficient strength to return his board of estimates.

La Guardia's nomination by the Fusionists was never in question. The American Labor party, however, was at first sharply divided between its state organization or right wing, which favoured the mayor on all counts, and its New York county organization or left wing, which denounced him for his treatment of the transit workers and more particularly for his approval of President Roosevelt's foreign policy. On June 16 this left wing promised to offer a definitely antiwar candidate. But the invasion of Russia soon caused it to reverse its position and to line up with the right wing in strong advocacy of La Guardia's re-election.

In the Republican primary the mayor was supported by most of the party leaders. John R. Davies, former president of the National Republican club, entered the field against him on the ground that he was not a regular or dependable member of the party and that he was known to have strong interventionist opinions. But La Guardia was nominated by a large majority in a light poll.

The Democrats in the meantime, having canvassed their possibilities, fixed without important dissent upon William O'Dwyer of Brooklyn. And the Socialists, with a platform emphasizing their disapproval of American participation in the war and their disappointment with the reforms and public improvements of the city administration, selected as their candidate Dr. George W. Hartman of Teachers' college.

In the campaign that followed, the Democratic candidate was actively supported by National Chairman Edward J. Flynn and former Chairman James A. Farley, while La Guardia had the endorsements of Thomas E. Dewey, Wendell L. Willkie and President Roosevelt. The mayor stood

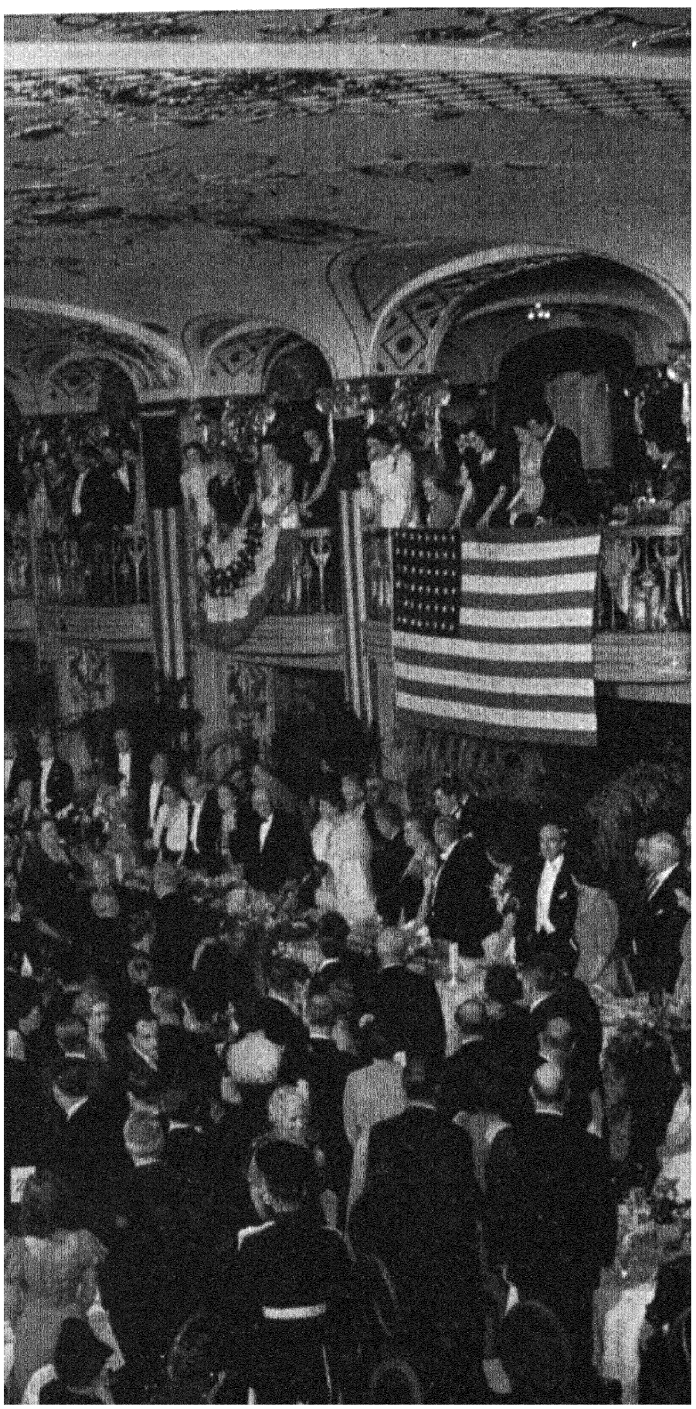
EIRE PAID TRIBUTE on Easter Sunday 1941 to its dead heroes of the Easter Week rebellion of 1916 by staging a mammoth parade in Dublin and placing floral bouquets under glass jars near the grave of Michael Collins

upon his record of clean and efficient government. The Democrats charged that he had been extravagant and sought to prove that he was in alliance with communists. They generally avoided the question of international relations although they did foster the criticism that La Guardia in accepting the position of Civilian Defense director and continuing in office as mayor had undertaken more than he could properly handle. And efforts were made to muddy the waters of argument with the charge that he had not dealt firmly enough with anti-Semitic demonstrations in the city. But the most effective assault upon his entrenched political position came during the last two weeks of the campaign when in one of his speeches he made certain derogatory comments, which were construed by the Democrats to impugn the honesty of Governor Lehman and of the State court of appeals. La Guardia repudiated any such meaning in his words, but the damage was done. For when the votes were counted, he was found to have carried the election by a majority of only about 52% (1,186,394 votes to 1,052,553 for O'Dwyer and 24,145 for Hartman).

The special election of 1941 that caused most widespread interest was that held by Texas in June to choose a successor to the late Senator Morris Sheppard. In this election no clear issue was developed other than that of the personalities involved. There were four major candidates: Governor W. Lee O'Daniel, Representative Lyndon B. Johnson, State's Attorney General Gerald Mann and Representative Martin Dies. President Roosevelt expressed a preference for Johnson. But Governor O'Daniel carried the election by a plurality of 1,311 votes over Johnson, with Mann running third and Dies fourth. Dies later attributed his defeat largely to the efforts of "C.I.O. and fifth column organizations" and charged that there had been wholesale violations of the Hatch act.

Other senatorial vacancies were filled during 1941 by election or appointment in the states of Arkansas, Mississippi and South Carolina without altering the party balance. Representatives were elected for the 6th district of Maryland; the 2nd district of Mississippi; the 14th, 17th and 42nd districts of New York state; the 7th district of Oklahoma; the 15th district of Pennsylvania; the 2nd district of Virginia; and the 1st district of Wisconsin, with the result of a net gain of two seats for the Republicans.

The only regular gubernatorial election of 1941 was in Virginia where Colgate W. Darden, Jr., carried the Democratic primary and the final election by preponderant majorities. (*See* also DEMOCRATIC PARTY; PROPORTIONAL REPRESENTATION; REPUBLICAN PARTY; UNITED STATES; and under various state articles.) (G. P. BA.)



THE ELECTORAL COLLEGE'S first plenary meeting in U.S. history took place at Washington, D.C., Jan. 19, 1941, the night before Pres. Roosevelt's third inaugural

Electrical Industries. The year 1941 in the United States was a superlative period in the electric utility business in almost every respect except earnings. These, because of heavier taxes and increasing operating costs for a very large number of companies, showed a reduction from the previous year in spite of a large gross.

Total generation of energy in 1941 was 168,000,000,000 kw.hr., twice the production in 1933. The increase over the previous year was 23,000,000,000 kw.hr. This increase is more than 50% greater than the growth in any previous year.

For the first time in years the net imports from Canada fell below 1,000,000,000 kw.hr., amounting to approximately 900,000,000.

The generating capacity to produce this energy by the end of 1941 amounted to 44,350,000 kw., which was an increase in the 12-month period of 2,700,000 kw. Steam generation accounted for 31,000,000 kw., internal combustion was 1,000,000 and hydro the remainder. The ratios of the several types of prime mover to the total remained approximately the same as in 1940, namely, steam 70%, hydro 28% and internal combustion 2%.

Of the total, 16% was publicly owned, divided about equally between municipal and the federal government. The amount of government generating capacity, both through construction and acquisition, increased nearly one-third in the year, municipal only 6%. The construction planned for 1942 would, if completed, increase the government-owned plant again by one-third.

The statistics show but one state to have no public ownership, Rhode Island. Nearly 80% of the municipally owned generating capacity lies in three sections: east north central, 784,200 kw.; west north central, 601,500 kw.; and Pacific, 917,600 kw.

Governmental projects in 1941 were operating in 34 states. In Tennessee the generation was almost entirely government-owned TVA. In Nebraska public generating capacity (both municipal and government) was approximately 64% of the total; Alabama, 45%; Mississippi, 50%; Wyoming, 56%; Arizona, 80%; Nevada, 98%; Washington, 51%; Oregon, 44%; and California, 22%. Approximately 40% of the publicly owned generating capacity lay east of the Mississippi and 60% west.

The new generating capacity added during 1941 was distributed all over the country; only one state, Delaware, having no additions. The heavy additions occurred in the heavy industrial and mineral producing areas, reflecting defense requirements: New York with 275,000 kw., Illinois with 243,000 kw. and Ohio with 210,000 kw. were the largest contributors to more generating capacity.

Fuel generation accounted for 69% of the energy output in 1941 and hydro 31%. In the previous year the hydro ratio was 33%. While part of this drop was due to the drought all along the eastern seaboard, the more important cause of this relative position change was the increasing hours of factory production in the steam plant areas. The average hours use of steam generating plant in 1941 increased by nearly 15% to over 3,700 hr. The best predepression year was 1929, with less than 2,700 hr. Hydro also increased hours of use, exceeding for the first time an average of

more than half the hours in the year. Combined, the hours use of all generating capacity averaged slightly over 3,900 hours.

Lack of rainfall east of the Mississippi reduced the amount of hydro energy and in the southeast brought about a system of rationing for a short period in the early summer and again in November of 1941. Timely arrival of rains prevented a similar occurrence in New England late in the year. The situation in the southeast was further aggravated by the rapidly increasing production of war-needed aluminum. The entire southern area was called on to share the burden of making up the deficiency. Power-pooling on an area basis had been discussed before, but this was the first time it was put into effect.

Energy sales for 1941 were slightly in excess of 140,000,000,000 kw.hr., an increase in the year of nearly 22,000,000,000, or 18.3%. The greatest gain came from large industrial customers, who took 28% more than in 1940, for a total of over 76,000,000,000 kw.hr. While this class of customer accounted for 54% of all sales in 1941 against 50% in 1940 there was still some room to go before the predepression ratios were exceeded. In 1929, for instance, the industrial sales amounted to 57% of the total.

Nevertheless, the industrial load was the one that dominated the economics of the period, accounting as it did for nearly three-quarters of the increased sales in 1941. Small commercial sales, which include sales to small factory customers, took a spurt and came very close to residential sales. The two were: commercial, 24,700,000,000 kw.hr., residential 25,000,000,000 kw.hr. In fact, residential sales showed a deceleration in 1941. They were still ahead by nearly 8%, but the rate of increase of previous years was not maintained. Rural sales took a leap of 18% in 1941 from just under 2,000,000,000 to 2,350,000,000 kw.hr. This was caused primarily by the addition of over 300,000 new rural customers. Street and highway lighting sales continued their upward trend largely because of new projects. Whether this trend would continue in 1942 was a question, because of air-raid precautions.

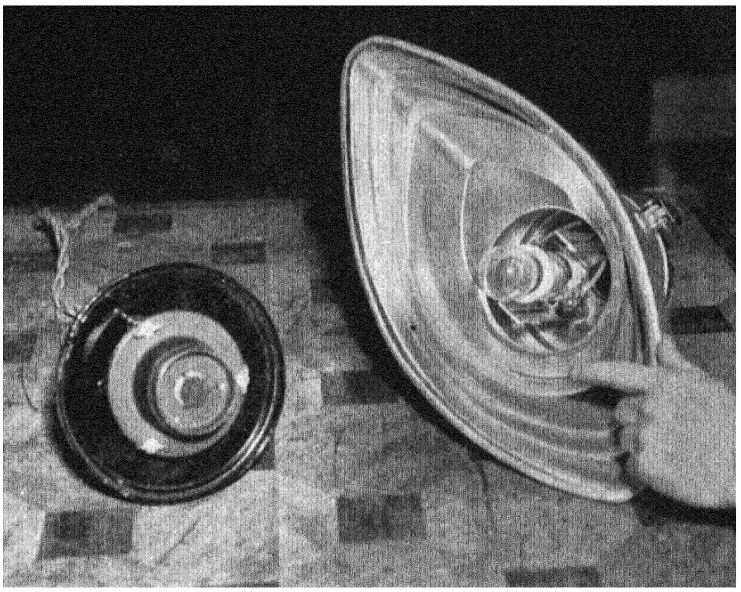
Improved financial condition of workers was reflected in an increase of more than 1,000,000 residential customers. The added rural and other classes of customers brought the total at the close of the year to 31,500,000 customers, an increase of 1,350,000, the greatest since the days of old house-wiring campaigns in 1926. The number of families taking electric service in the United States in 1941 was approximately 27,000,000, or 76% of all the families in the country.

Decreases in electric rates were not as numerous as in the preceding five years, although some of the reductions were among the largest ever made. The average rate, however, continued to fall, due largely to increased usage in the lower-rate brackets. In 1930 the average price per residential kilowatt-hour was 5.78 cents. In 1940 it was 3.84 cents and in 1941, 3.73 cents. Average residential usage crept up from 952 kw.hr. in 1940 to 986 kw.hr. in 1941. The increase during the depression decade had been approximately 400 kw.hr. per householder.

Financially, the results of 1941 operations were not so good. In spite of an increase in gross revenue of almost 10% ($213,000,000) the net after interest and taxes was around 2% less than in 1940. Taxes jumped $100,000,000 to something over $500,000,000 and took just 20½ cents out of every dollar of revenue. Taxes in 1941 exceeded payrolls and were greater by 40% than combined bond interest and preferred dividends.

New financing was the lowest since 1937, amounting to approximately $700,000,000 against $958,000,000 in 1940. Only $110,000,000 was for new financing in 1941.

Construction expenditures were substantially below the amount budgeted Jan. 1, 1941. The amount spent was some $600,000,000, with a slightly higher amount budgeted for 1942. Just as 1941 expenditures were limited by priorities, so the figures for 1942 were predicated on securing permission to build.



COMPARISON of British (left) and U[illegible]nalres for blackout lighting of streets and sidewalks. The British unit uses a 25-watt incandescent lamp, whereas the U.S. unit has a shielded 2½-watt gaseous lamp and utilizes available light; it provides visibility of about 25 ft. but cannot be seen more than a few hundred feet above the ground. The first U.S. test of blackout lighting was conducted May 14, 1941 at Lynn, Massachusetts

The total generating capacity added in 1941 was 2,980,875 kw., and scheduled for future years was—1942, 3,618,404 kw.; 1943, 3,341,695 kw.; 1944, and later, 1,250,000 kw. Transmission lines exceeded the estimate of 1940 by nearly 50%, some 9,000 mi. having been erected during 1941, with another 9,000 mi. projected for 1942. This construction reflected both the physical integration of holding company properties and the sectional power-pooling mentioned earlier. Likewise, the erection of substations was increased from the first of the year (1941) estimate by 50%. Six and a quarter million kva. of substations went up in 1941 and 6,600,000 kva. was scheduled for 1942. Distribution construction to serve the retail customers was down and was expected to stay down until war demands had been filled and materials were again available.

Of the large steam turbines ordered during 1941 60% were hydrogen cooled, over 45% had 850-lb. pressure, 55% 900° F. and 77% would operate at 3,600 r.p.m. No units below 20,000 kw. would be hydrogen cooled. No superposed units above 25,000 kw. were purchased in 1941, over 90% of all units being for condensing operation.

Manufactures in 1941 exceeded 1929 in production for the first time. With an increase over 1940 of nearly 75%, total production, including turbines, appliances, lighting equipment and electrical equipment and supplies, exceeded $4,000,000,000. Employment in electrical manufacturing plants was up 42% in the year. Appliance sales were up 40% and refrigerators up 56%, general electrical materials up 79%, industrial apparatus up 90%, wire and cable up 90% and transmission and distribution equipment up 60%. Sales of 3,500,000 electric refrigerators and 750,000 electric ranges were all-time highs. Limitation of materials would make it impossible to again reach such volumes until after the war.

Lighting. Fluorescent lighting was responsible in 1941 for a greater advance in illumination levels than in any previous year. Over 600 installations, covering more than 3,000,000 sq.ft. of floor space were reported, with intensities in excess of 50 ft.-candles, 85% of these being lighted with fluorescent lamps. In new plant construction from 30 to 50 ft.-candles maintained-in-service was the rule in 1941.

Production of large lamps was estimated to reach 740,000,000 units, an increase of 146,000,000 in the year. Of this total, fluorescent would account for around 22,000,000 tubes, an increase of 300% during the year. In spite of the rapidity of growth of tube lighting, the filament output continued to increase by almost record-breaking figures.

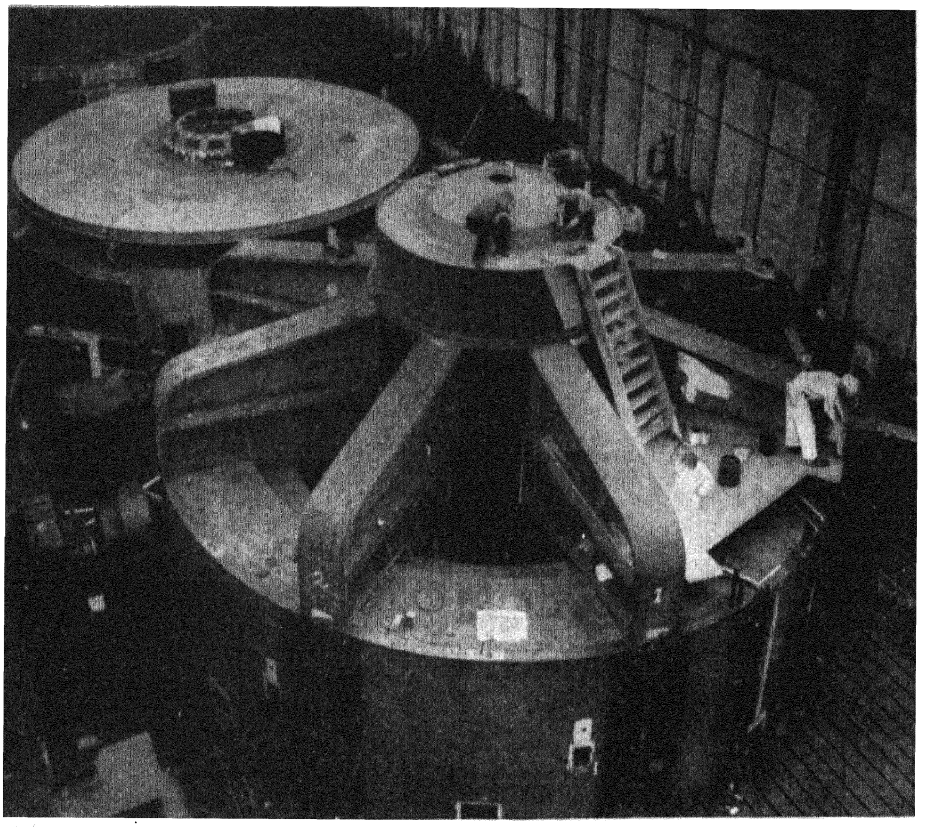
The trend in wattage sizes in filament lamps in 1941 was toward the larger sizes. In the 200- to 1,500-watt group, the increase was 25%, while in the 7½- to 50-watt group it was but 6%. In fluorescent lighting the 40-watt lamp was out in front, absorbing between 50% and 60% of the output, 20 watts was next at about 20%. The daylight fluorescent, which at first was expected to lead the demand, ran a poor second. White was first at nearly 60% of demand and daylight at 30%.

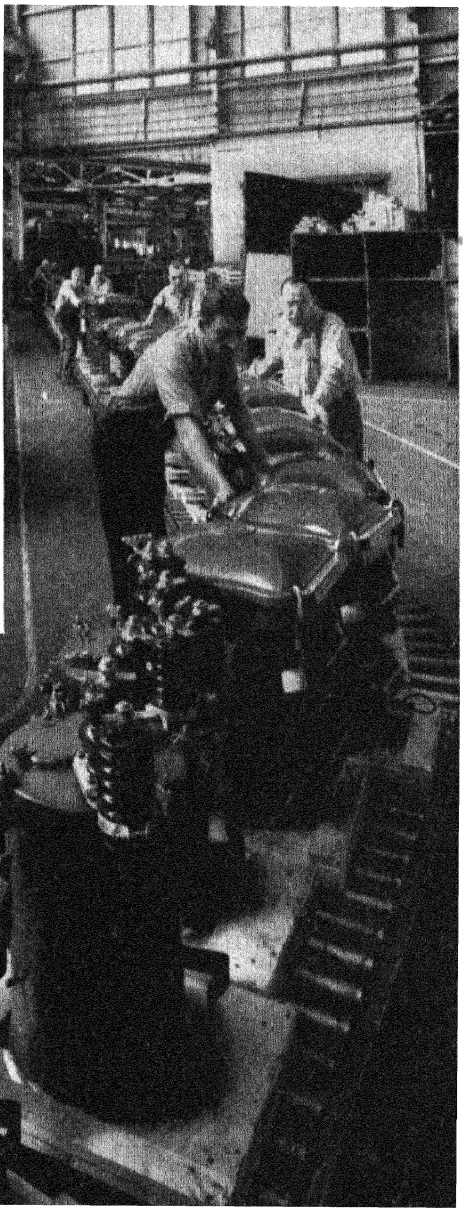
High-tension fluorescent lighting gained considerable headway during 1941. While still used very largely for decoration, a straight tubing in 4-ft. and 6-ft. lengths was developed for utility lighting. Advantage was higher efficiency in light production.

There was little new in general filament lighting practice during 1941. In fluorescent a great many better-designed equipments came on the market and some trends became apparent. Probably the most noticeable was the line of light in troffers. Several adaptations of this appeared, designed to reduce glare discomfort for those in the line.

Greater attention was given to shielding the light sources by means of special glass or of plastics. There were also developed lens units for directional lighting with fluorescent sources.

The greatest handicap encountered was the loss of aluminum because of defense requirements. Resort was made to aluminum paints and other bright metals. As the year 1941 was closing, shortages in other metals and some plastics used in fixture manufacture were requiring the industry to seek out other substitutes. The newer baked-paint finishes appeared to be looming up as a competitor to porcelain enamel.



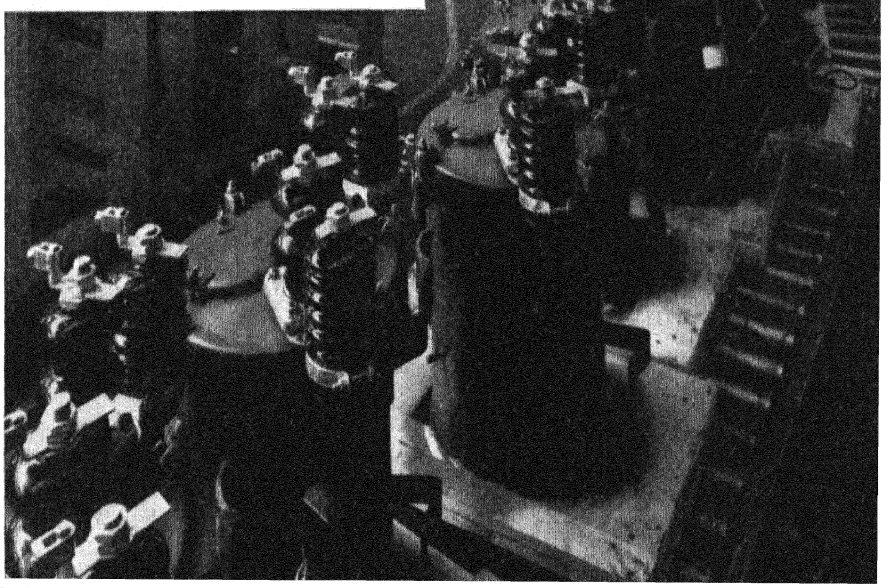


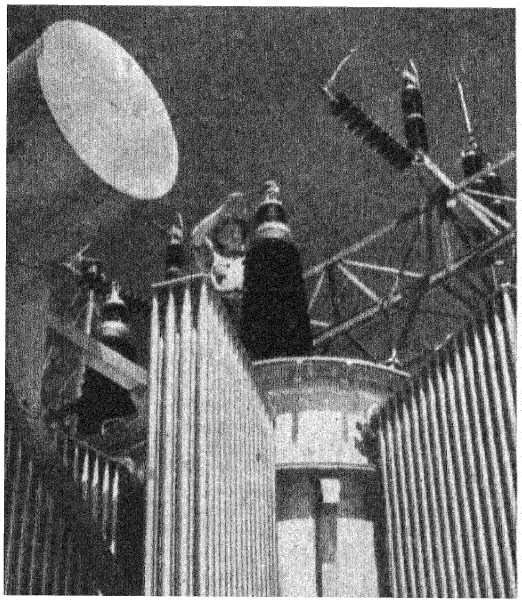
Above: THE 108,000-KILOWATT GENERATOR in the foreground, world's largest water wheel generator, was one of three built at East Pittsburgh, Pa. in 1941 for the Grand Coulee dam in Washington. In the background is a 40,000-kilowatt generator for Pickwick Landing dam in Tennessee

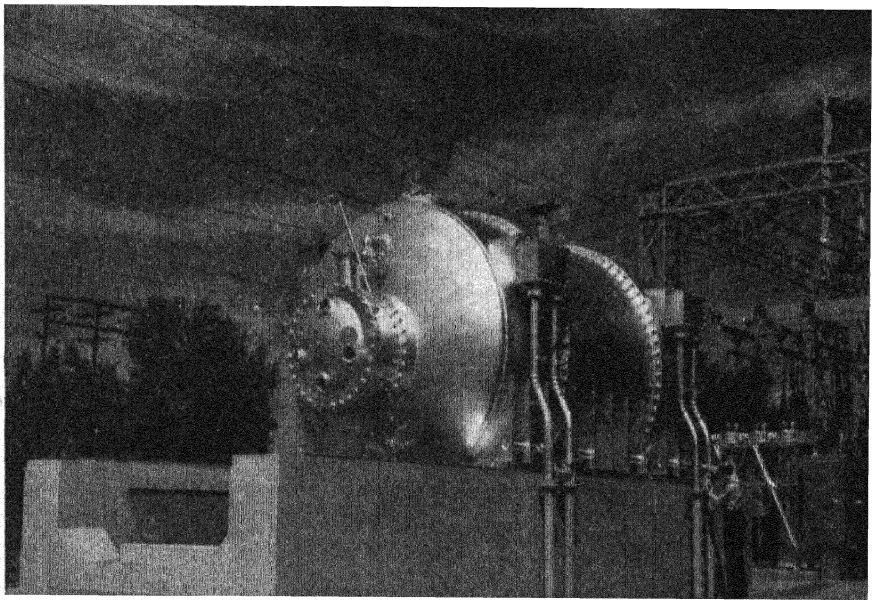
Right: PRODUCTION LINE of transformers built in 1941 for navy shipbuilding stations

Below, left: COMPLETING a giant power transformer in 1941 for use in New Hampshire

Below, right: HYDROGEN-COOLED synchronous condenser installed in 1941 at Denver







Paint took on an added significance in lighting through research into the contrast values of certain colours on machinery under artificial lighting. The studies indicated increased speed in production and greater safety would result from this so-called "third-dimensional seeing."

Cove lighting started to come back during 1941, low brightness fluorescent sources making luminous coves practicable. There was also a distinct trend toward close ceiling mounting and coffers.

Street lighting advanced rapidly until priorities and blackout threats intervened. A new highway lighting code was disseminated by the Illuminating Engineering society. The longest stretch of street lighting was installed in Canada—a distance of 70 mi. between Toronto and Niagara Falls, with 6,000-lumen lamps on 200-ft. and 150-ft. spacings.

Transmission and Distribution.—More long-distance transmission was installed in 1941 than at any time since the '20s, when the great expansion of interconnection took place. Montana, Utah and Idaho were connected. Lines were strung west from Grand Coulee, Kansas and Nebraska, hooked up and several lines erected to serve defense industry and cantonments. The southeast drought caused the building of a considerable mileage of tie lines under Federal Power Commission order.

Distribution was devoted more to industrial loads where substation and feeder strengthening was needed. As a result, the amount of underground construction fell off. Many studies, however, were made for extending networks.

The new National Safety code for line construction was issued by the bureau of standards, providing for lower loading requirements and a remapping of the loading areas. Capacitors were used extensively to provide additional capacity without increasing copper, improve voltage and reduce system losses. As the year was closing, regulators were being purchased for the same purpose.

Interest in portable equipment was shown in several directions. Orders were placed for large steam generating sets on flat cars, while smaller portable Diesel sets were used in the rural field. Portable capacitors made their appearance, while the sale of portable substations increased considerably.

Air-blast circuit breakers began to take precedence over oil for indoor use for large currents and several large units were shipped for outdoor use on hydro projects. A fuse with 1,000,000 kva. interrupting capacity at 69,000 volts appeared. Lightning arrestors of higher rating were announced, while at the same time considerable attention was given to lower cost gaps for rural line protection.

There was less of a fundamentally new nature brought out during 1941 because manufacturers generally had more business than they could handle and because the Office of Production Management (*q.v.*) frowned on substituting new design when products in use were functioning. By the end of the year the supply of new devices had virtually dried up.

In industry the trend was toward motors of lower weight and better protection against dirt and heat. Glass insulation was used in larger volume. Networks for interior distribution found use in most new large munitions factories.

Rectifiers were produced in tremendous quantities to take care of the leaping production of aluminum. Metal reduction and alloy melts absorbed quantities of electric furnace. England demonstrated that electric sheet was superior for armament.

There was nothing of particular significance in the home except for the record-breaking consumption of appliances. Agreement was reached on a standard for refillable fuses which became mandatory on Nov. 1 under the National Electrical code for new work.

In a great many respects 1941 was a year of necessity operations with some planning for postwar activities. Unrest due to international conditions, difficulty in getting equipment, threat of government ownership and the cloud of holding company disintegration under the Utility act served to hold things back. (*See* also PUBLIC UTILITIES.)

The split-up of the United Gas Improvement system under the act, according to a "blueprint" made by the Securities and Exchange commission (*q.v.*), gave evidence of what the holding companies might expect. Standard Gas disposed of its San Diego property and was making arrangements to keep as its system the Pittsburgh area. North American was doing likewise. Associated announced a plan and others were expected. Bond and Share through a subsidiary was making plans to give up Houston.

Development of the St. Lawrence and the Arkansas valley up through Colorado was strongly promoted. Vigorous opposition, however, held them up although they were contained in an omnibus bill. Santee-Cooper and Grand Coulee began operations and Marshall Ford, the last link in the Lower Colorado River authority, was completed. (*See* also DAMS.)

The supreme court in the New River case shattered an old precedent by holding all streams capable of being made navigable to come under federal jurisdiction insofar as hydro development was concerned. The FPC invoked the prudent investment theory of rate making in the State Line case. Some few state commissions gave heed to the effect of higher taxes by permitting tax adjustment clauses. The effect was nullified somewhat by the Lawrence Gas case in Massachusetts, where the opposite was decided. The SEC declared the Edison Electric institute to be a service organization under the Utility act and as such it had to register.

BIBLIOGRAPHY.—"Illuminating Engineering Society Progress Committee Report," *Illuminating Engineering* (Dec. 1941); *Electrical World; Reports* of the Edison Electric Institute, Federal Power Commission, Office of Production Management, etc. (S. B. WI.)

Electric Lighting: *see* ELECTRICAL INDUSTRIES.

Electric Transmission and Distribution: *see* ELECTRICAL INDUSTRIES.

Electric Transportation.

Four types of electric transportation were in widespread use in 1941. They were: (1) electrified trunk-line railroads; (2) subway and elevated rapid transit lines; (3) street and interurban electric railways; and (4) electric trolley buses.

During 1941 the progress of all forms of electric transportation was retarded by the prevailing wartime conditions. The number of new electric transportation projects started was smaller than normal. On the other hand, the use of existing facilities was greatly augmented.

In the United States it became apparent, early in 1941, that the demands of the national defense program would be so great that men and materials could not be spared for new projects of a nondefense character. For that reason, no extensions of electrified trunk-line railroads were undertaken and no new rapid transit projects started, although work continued on the subway previously begun at Chicago, Ill. There were a few extensions to existing street and interurban railways, but they were all of a minor character. A few new trolley bus systems were placed in operation during the year, but these had been planned and started before the demands of national defense became predominant.

In Canada the same general conditions prevailed as in the United States. In Great Britain they had come into existence even earlier. Few details were available concerning the electric transportation systems in most of the other countries having extensive facilities of this kind, but all evidence pointed to a virtual cessation of expansion.

Rapid Transit.—In 1940 there were 20 cities throughout the world having either subway or elevated railway service. Those having subways were Barcelona, Berlin, Boston, Buenos Aires, Glasgow, London, Madrid, Moscow, New York, Osaka, Paris, Philadelphia, Sydney and Tokyo. Chicago had an extensive subway project under construction, and similar activities were reported from Munich and Prague. Cities having elevated railway systems included Chicago, Hamburg, Liverpool, New York and Philadelphia. Besides these there were services of a rapid transit character in a number of other places such as Cleveland and Vienna.

Elberfeld (Germany) had the distinction of having the world's only monorail elevated line. In the absence of any information concerning extensions or new rapid transit projects, it would appear that the situation existing in 1940 remained unchanged in 1941.

Surface Electric Railways.—For many years there has been a trend in the United States toward the substitution of motor buses for surface electric rail cars where the volume of traffic is not sufficient to justify the heavy expenditures necessary for the upkeep of track and electric power facilities. Prior to 1941 this trend had resulted in the abandonment of a large amount of suburban and interurban electrified track mileage. City electric railway systems had been influenced by this trend to some extent, but the effect had been more noticeable in the small cities than in the large cities. At the close of 1941 Seattle, Wash., a city of 368,000 population, was the largest city in the United States to have dispensed with all electric railway service. In its place the local transit system was operating a combination of electric trolley buses and motor buses. Among the larger cities, Baltimore, Md., Philadelphia, Pa., Pittsburgh, Pa., St. Louis, Mo.

Cities With New Streamlined Street Cars

(U.S. and Canada—As of Jan. 1, 1942)

City	Number of cars	City	Number of cars
Atlantic City, N. J.	26	Philadelphia, Pa.	263
Baltimore, Md.	200	Pittsburgh, Pa.	401
Boston, Mass.	21	St. Louis, Mo.	200
Chicago, Ill.	83	San Diego, Calif.	28
Cincinnati, O.	30	San Francisco, Calif.	5
Kansas City, Mo.	24	Toronto, Can.	250
Los Angeles, Calif.	125*	Washington, D.C.	209
New York, N. Y. (Brooklyn)	100	Vancouver, Can.	4

*Los Angeles railway, 95; Pacific Electric railway, 30.

and Washington, D.C. demonstrated their faith in street railways by adding to their fleets of streamlined cars of the type developed by the Electric Railway Presidents' Conference committee. So, too, did Toronto, Can.

Under normal conditions the general trend from electric railway service to service by bus or trolley bus might have been expected to continue during 1941. Early in the year, however, the steady increase in riding made it evident that virtually all the available new vehicles would be needed to provide additional service and for that reason could not be utilized to replace existing vehicles so long as the latter were capable of rendering reasonably satisfactory service. Hence, there was less change from one form of service to another during 1941 than there had been in previous years. In Canada, too, the extent of electric surface railway facilities underwent only slight change.

In Great Britain the local passenger transportation industry had undergone vast changes during the decade preceding the outbreak of World War II. Trolley buses or motor buses had largely superseded the worn-out street railway systems in the smaller towns. Such street railways as were left were mainly in the big industrial cities. Almost every mile of their track had been put in good condition and most of the older street cars had been replaced by new high-speed types. The industry was thus in an excellent condition to meet the strain of war and had continued since 1939 with no significant changes from one type of service to another.

The interurban electric railway field experienced few changes during 1941. New high-speed trains were put in service between Chicago, Ill., and Milwaukee, Wis., and cars of the Presidents' Conference committee type, modified for train operation, were introduced on lines running out of Los Angeles, Calif. A small amount of track was abandoned in favour of motor bus operation.

Trolley Buses.—During 1941 trolley bus operation in the United States expanded steadily. New systems were established at Akron, O., Dayton, O., and San Francisco, Calif. More significant than the establishment of new systems, however, was the expansion of operation in cities where this type of vehicle was already in service. Approximately 2,800 trolley buses were being operated in 67 cities of the United States at the beginning of 1941. By the end of the year the number had increased to approximately 3,200. While this type of service did not yet compare in scope with that of other forms of electric transportation, its progress appeared remarkable in light of the fact that there were scarcely more than 200 such vehicles in service in 1931.

Most of the technical problems connected with the operation of trolley buses have been solved through improvement in design, and this form of transportation has proved itself to be extremely satisfactory and economical. For this reason there was every reason to expect that the next ten years would witness an increase in the use of this vehicle as great as or greater than that which had taken place since 1931.

Traffic Trends.—In contrast to the relatively small changes in the physical plant of the electric transportation systems was a very marked change in the intensity of their use. Under the stimulation of the national defense program in the United States, riding increased sharply on virtually all of these systems. The same situation prevailed in Canada and Great Britain. Outbreak of war in the Pacific further accentuated the need for public transportation service, through curtailment of rubber supplies and the production of private automobiles. As a result, the year closed with indications that the already heavy volume of traffic being carried by the electric transportation systems would be substantially increased during 1942. (J. A. Mi.)

Electrification, Rural: *see* RURAL ELECTRIFICATION.

Electron Microscope: *see* RADIO: *Scientific Developments.*

Elementary Education: *see* EDUCATION.

Ellis, Carleton (1876–1941), U.S. research chemist, inventor and author, was born Sept. 20 in Keene, N.H. At the time of his death he held 800 patents, the third largest number for an individual in the history of the United States patent office, and had several hundred patents pending in Washington. He maintained two research laboratories, one in Montclair, N.J., and the other at Key West, Fla. His chemical experiments produced more than 100,000 compounds, and he worked extensively in edible oils and fats, in waxes, synthetic resins, paints, varnishes and petroleum derivatives. He also invented a substance intended to fireproof warplanes against incendiary bullets. He wrote on ultra-violet rays, synthetic resins, hydrogenation of oils and printing inks, and was co-author of a work on *Soilless Growth.* He died Jan. 13 at Miami Beach, Fla.

El Salvador: *see* SALVADOR, EL.

Eltinge, Julian (1883–1941), U.S. actor, was born May 14 at Newtonville, Mass. Eltinge, whose real name was William Dalton, was famous as a female impersonator in the early part of the century. At the age of 10 he played his first female role in an annual revue of the old Boston cadets. In the early 1900s he played in vaudeville and toured the United States and Europe. He gave a command performance at Windsor castle for King Edward VII, who presented him with a bulldog. In 1910, together with two associates, he built the Eltinge theatre in New York city. Eltinge played the dual role of Mrs. Monte and Hal Blake in *The Fascinating Widow* (1911), a play written for him. His other successes were in *The Crinoline Girl* and in *Cousin Lucy.* He starred in several motion pictures in the silent screen days. Eltinge died in New York city, March 7.

Embassies, Great Britain: *see* AMBASSADORS AND ENVOYS: *To and from Great Britain.*

Embassies, United States: *see* AMBASSADORS AND ENVOYS: *To and from the United States.*

Emergency Management, Office for. The Office for Emergency Management, known as the OEM, was established by an administrative order issued May 25, 1940, to function within the executive office of the president created under the reorganization act of Sept. 1939. The purpose of the OEM was twofold: (1) to act as a clearing agency for all information relating to national defense; (2) to provide a liaison between the president and the various defense agencies. On Jan. 7, 1941, its status was further defined as an office which was to assist the president in the discharge of all executive duties in connection with the national emergency. On Feb. 28, 1941, all funds of the advisory commission to the council of national defense were allocated to the OEM, which in 1941 became a sort of "holding company" for the most important agencies of national defense. The following agencies were component parts of the OEM at the close of 1941: Office of Civilian Defense; Defense Communications board; National Defense Mediation board; Office of Price Administration; Office of Production Management; Supply Priorities and Allocations board; Office of Scientific Research and Development; Economic Warfare board; Office of Lend-Lease Administration (*qq.v.*); Office of Defense Health and Welfare Services; Transportation division; Division of Defense Housing Co-ordination; Office of the Co-ordinator of Inter-American Affairs; Office of Agricultural Defense Relations; Co-ordinator of Information

(*see* DONOVAN, WILLIAM J.); Office of Export Control; and the Permanent Joint Board on Defense (U.S. and Canada).

W. H. McReynolds, one of the six assistants in the executive office of the president, was the first liaison officer in charge of OEM, but in April 1941, he was succeeded by Wayne Coy. (*See* also DEFENSE, NATIONAL [U.S.].)

Emery: *see* ABRASIVES.

Emigration: *see* IMMIGRATION AND EMIGRATION.

Emmons, Delos Carleton (1888–), U.S. army officer, was born Jan. 17 in Huntington, W.Va. He was graduated from West Point in 1909 and was commissioned as an infantry lieutenant. In 1917, he was transferred to the aviation service of the signal corps, remaining in this branch of the service throughout World War I. In 1934, he was sent to Hawaii as commanding officer of an air unit. He returned to the United States in 1936 and became brigadier general the same year, major general in 1939 and lieutenant general in 1940. He was appointed commanding general of the G.H.Q. air force in 1939. Emmons, who is rated as a command pilot and command observer, the two highest rankings for airmen in the U.S. army, was sent to London in Aug. 1940 as a military observer. In June 1941, he was named chief of the air force combat command. After Secretary of Navy Knox told the nation that Hawaii's defense forces were not on the alert during the Japanese attack on Pearl Harbor, Gen. Emmons was designated Dec. 17, 1941, as head of the army command of the Hawaiian department, succeeding Lieut. Gen. Walter Short (*q.v.*). Emmons was given over-all command of the army and air force at Hawaii.

Enderbury Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Endocrinology. Increase in stature and weight is the net result of innumerable bodily processes, the failure of any one of which (even though it is not directly concerned in the process of growth) may result in a growth disturbance. Thus the rate of growth of normal laboratory animals has long been used as an index of the adequacy and completeness of nutrition. Using this general index, Lacqueur and coworkers have shown that the growth hormone present in extracts of the anterior hypophysis is not the only endocrine regulator of the growth process, and that part of its action may be through the stimulation of other glands. They found that hypophysectomized rats which had ceased growing showed some resumption of growth when treated with thyroid extract. It was also possible to obtain some growth response by administering pituitary extracts to thyroidectomized animals. The best stimulation of growth in hypophysectomized rats was obtained by giving both thyroid extract and pituitary hormones, indicating an additive or synergistic action of these materials. However, at this stage of knowledge of the subject, it is impossible to assay the relative importance of the various hormones in the growth process on the basis of any single type of experiment. Certain of the endocrine glands may be more important for some stages of growth and development and less important for others. Salmon showed that the administration of growth hormone to rats which had been thyroidectomized at birth caused very little growth response. But the same treatment of rats thyroidectomized at 35–45 days was followed by a good growth response.

The nonspecific nature of growth in general has made it desirable to seek a more definitive criterion of this process. For this reason much of the significant work during 1941 was based on the observation of the effects obtained on the long bones of the body. Ingalls reviewed the previous knowledge of normal bone growth and added his own careful and systematic studies. The growth of long bones proceeds principally from so-called centres of ossification or epiphyses at each end of the bony shaft. Coincident with the lengthening of the bone there is, of course, also an increase in its diameter, brought about by the deposition of bone from the cells lining the fibrous sheath or periosteum which covers its entire length. But the end of a growing bone lengthens by virtue of the proliferation of the cells composing a transverse layer of cartilage. This proliferation starts at the most distal portion of the cartilage and proceeds in the direction of the bony shaft. As the cartilage cells move farthest away from the centre of growth they become degenerated, then calcified and are finally converted into true bone by an ingrowth of blood vessels and specialized cells from the bone marrow. Thus the continued growth of bone depends upon a maintenance of a rate of proliferation of the epiphyseal cartilage in excess of the rate of calcification and ossification. When this condition no longer obtains, the layer of cartilage narrows as calcification and ossification overtake proliferation; and when the cartilage as such is completely gone, the growing centre has been obliterated and growth ceases. With this outline in mind it is obvious that the influence of a particular hormone will depend upon the degree to which it hastens or retards the proliferation of cartilage, or the calcification and ossification of the cartilage, or both. In addition it may affect the rate of ageing of the bone, which is manifested by a resorption of some of the interior structure and a thinning of the bony cortex.

Ingalls found that after hypophysectomy in the rat there was an inhibition or lack of proliferation of the epiphyseal cartilage, resulting in a definite diminution in its thickness. At the same time, there was an almost corresponding retardation of calcification and ossification, so that while bone growth had ceased the growing centre was not obliterated and remained capable of being stimulated to grow. Adrenalectomy resulted in a very similar situation, which suggests that the interruption of growth which follows hypophysectomy may depend to a considerable extent upon the atrophy of the adrenal cortex, which results from removal of the pituitary gland.

Using similar methods, the Silberbergs implicated a number of other hormones in the process of bone growth. They found that the administration of thyroid hormone to normal animals caused an acceleration of all phases of bone growth. However, while its initial effects were more pronounced as regards cartilage proliferation, the continued administration of thyroid was accompanied by a relative acceleration of calcification and ossification, so that the final result was a premature and permanent cessation of growth. The administration of anterior pituitary extract yielded similar results but without as marked a tendency for reversal of initial growth to cessation of growth. Oestrogen and testosterone caused an inhibition of cartilage proliferation and an increased rate of calcification in some animals, although in others this initial stage of inhibition was followed by a temporary increase in the rate of proliferation of cartilage. Progesterone, on the other hand, induced effects which were more or less directly opposed to those of oestrogen. However, the picture which resulted from the administration of the sex hormones was probably confused by the variable influence of these substances (depending upon the dose and the age of the animal) upon the activity of the other endocrine glands, particularly the anterior hypophysis. Perhaps a clearer indication of the influence of the gonads was gained by gonadectomy in the growing animal. Under these circumstances there was an increased rate of proliferation of the epiphyseal cartilage, accompanied by a retardation of calcification and bone formation, and the rate of growth of bone increased.

While there are a number of parallelisms between the experimental results which have been quoted and the clinical experience gained from the observation of patients suffering from abnormalities of growth, there are also a number of apparent contradictions, and little direct application of the experimental facts can yet be made to the treatment of growth disorders. In fact, the experimental work suggests that the use of individual hormones without relation to the balanced and simultaneous action of others may be a double-edged weapon. However, sufficient is already known to explain certain well known clinical observations, and the more complete knowledge being accumulated should soon amplify our clinical understanding and armamentarium in this field.

Anterior Pituitary Gland.—There was further work relating to the regulation of endocrine activity both by nonendocrine factors and by the influence of one gland on the other. Mulinos and Pomerantz continued their work on undernutrition and showed that undernourished rats develop gonadal atrophy and a loss of sex functions. This effect is through an inhibition of the pituitary and specifically an inhibition of its gonadotropic activity, for their undernourished rats were completely restored to normal sex activity by the administration of chorionic and other gonadotropic substances.

The work of Bakay indicated a regulating influence of the pituitary gland on the pancreas. The pancreatic glands of his dogs, 2½–6 months after hypophysectomy, showed a 20–120% increase in the size of the islets of Langerhans. There was apparently also an appearance of newly formed islets, in which beta-cells seemed to predominate. The nuclei of the beta-cells were somewhat larger than normal. Bakay concluded that the hypophysis normally produces a hormone which inhibits the activity of the islets of Langerhans. If his results are confirmed and his interpretation is correct, this work may lead to an alternative explanation of the so-called "pituitary" diabetic animal. It has hitherto seemed most likely that the production of permanent diabetes in dogs by the administration of increasing massive doses of anterior pituitary extracts was due to an overstimulation of the islet cells, resulting eventually in overwork atrophy. Bakay's work suggests that the explanation may be an overwhelming direct inhibition of the insulin-producing cells to a degree which causes permanent damage.

Thyroid.—It has been previously shown that the simple iodination of casein or serum proteins results in the formation of materials having thyroid hormone activity, and that hydrolysates of these materials contain thyroxine. Work in 1941 tended to show that the above observations have physiological significance as regards the possible extra-thyroidal production of thyroid hormone. Chapman found that the administration of iodine causes some increase in the metabolic rate of thyroidectomized animals. The work of the Silberbergs, already referred to, showed that potassium iodide produced effects on bone growth somewhat similar to those of thyroid hormone when both were compared in the thyroidectomized animal. The nature of the physiologically active complex or compound into which the iodine is incorporated was indicated by the work of Muus and coworkers. These authors tested the products formed by the iodination of serum albumin on myxoedematous patients. They found that their product began to show activity when it contained 6% iodine and increased in activity as its iodine content increased to 10%. It was calculated that the formation of diiodotyrosine could account for the amount of iodine which had to be present to obtain minimum activity, and that the increasing activity with further addition of iodine could be accounted for by the formation of thyroxine.

The regulation of the activity of the thyroid gland has also taken an unexpected turn, according to the evidence obtained from the *in vitro* experiments by Galli-Mainini. The previous discovery of the thyrotropic hormone of the anterior pituitary gland, and of the inhibiting action of the thyroid hormone on the same gland, had seemed to offer a satisfactory mechanism for the autoregulation of this system. However, the latter may be supplemented by an inhibitory action of the thyroid hormone directly upon the thyroid gland. Galli-Mainini showed that, while the addition of thyrotropic hormone to slices of thyroid gland *in vitro* increases the oxygen consumption of the tissue, the addition of thyroglobulin results in a decreased oxygen consumption.

Adrenal Cortex.—Since the demonstration of the diabetogenic effects of anterior pituitary extracts in normal dogs, there have been a number of unsuccessful attempts to obtain similar results in normal rats. The reason for this species difference was still unknown in 1941, but that it was not a fundamental difference as regards susceptibility to diabetes had become clear from the work of Ingle. He found that the administration of 17-hydroxy-11-dehydrocorticosterone to normal rats which were force-fed with a high carbohydrate diet caused hyperglycaemia, glycosuria, an increased urinary excretion of nonprotein nitrogen and a marked loss in weight.

Pancreas.—Despite the years which have passed since the discovery of insulin, its exact mechanism of action is still unknown. There has been general agreement as to only two direct effects of insulin administration: the depression of the blood sugar level and the storage of tissue glycogen. The fall in the level of blood inorganic phosphate which has been observed after insulin administration was formerly attributed to a reflex stimulation of the secretion of epinephrine, as a result of the hypoglycaemia caused by insulin. However, Soskin *et al.* showed that the blood inorganic phosphate change must be considered as one of the direct effects of insulin, since it occurs in the adrenalectomized dog but cannot be produced in the depancreatized animal by any means except insulin. The esterification of the blood inorganic phosphate by insulin, when considered in relation to the wider problem of insulin action on carbohydrate metabolism, may indicate that insulin directly or indirectly facilitates a phosphorylation which precedes the entry of blood glucose into a metabolic cycle necessary for both glycogen storage and oxidative breakdown.

Gonads.—Still another relationship of the sex hormones to the general metabolic functions of the body was demonstrated. Ingle showed that the administration of either estradiol or stilbestrol to normal or partially depancreatized rats produces hyperglycaemia and glycosuria. Similar results were obtained with dihydrostilbestrol and equillin. Massive doses of testosterone and methyl testosterone were only weakly diabetogenic. These results, when distinctly positive, were accompanied by a hypertrophy of the adrenal cortex, and it seemed probable at the close of 1941 that the effects are produced as a result of the stimulation of this gland. (*See* also PHYSIOLOGY; ZOOLOGY.) (S. So.)

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England: *see* GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

English Literature.

Poetry and belles lettres were but meagrely represented in 1941. In his *New Year Letter*, W. H. Auden echoed *Hudibras* and thumped his pulpit with his usual skill, without saying anything in particular; while in *Plant and Phantom*, Louis Macneice displayed his customary verbal felicity. On the other flank, Sir Edward Marsh translated the *Odes of Horace* with great polish, and the *North Star* contained some good Binyon. In academic belles lettres students welcomed E. de Selincourt's erudite and definitive edition of *The Poetical Works of William Wordsworth. Poems Written in Youth: Poems Referring to Childhood,* in which he incontestably credited to Wordsworth certain poems usually attributed to Coleridge; and Geoffrey Tillotson's pleasant edition of *The Rape of the Lock*. Among purely critical works, C. B. Tinker's and H. F. Lowry's *Poetry of Matthew Arnold* was a sober and reliable estimate that might well become standard, while Edmund Wilson's *To the Finland Station* was a subtle and provocative analysis of the 19th century French historians and their influence on Lenin and his circle that should have attracted far more attention than it did.

History and biography, too, were comparatively ill represented. G. B. Harrison's *Jacobean Journal* carries on to the 17th century the amusing and illuminating newsreel he began in his *Elizabethan Journals*, and succeeds by its mosaic of quotation and learned parody in giving a truer cross section of Jacobean England than the majority of formal histories; while in more conventional mode, A. L. Rowse published an erudite and accomplished research into the culture and economy of *Tudor Cornwall;* and Adam Carse explored a neglected field in his scholarly *Orchestra in the XVIIIth Century.* In biography, J. L. Clifford, F. W. Walbank and Denis Mackail offered studies of Mrs. Thrale, Philip of Macedon and James Barrie respectively, of which only *The Life of Mrs. Thrale* is likely to have any lasting interest, though Mackail's *The Story of J. M. B.* will no doubt prove to be the standard life of its hero.

As was to be expected, by far the largest proportion of the year's outstanding books dealt with the conduct of the war, the prospects of the peace and the policies of the principal protagonists. How much grain was mingled with so much chaff will not be known for a decade, and the best a contemporary can do is to record those works which attracted the most attention and exercised the greatest immediate influence. *Black Record,* Sir Robert (now Lord) Vansittart's vigorous if challenging pocket history of the Teutonic "butcher-bird," was one of the year's best sellers.

Prominent among the military histories were Viscount Gort's revealing and depressing *Despatches,* and the air ministry's inspiring *Battle of Britain;* and on the sociopolitical side the American *Ambassador Dodd's Diary* and William Shirer's *Berlin Diary* excited considerable attention. But for the most part, censorship, the nearness of events, and the discretion of those most actively engaged have prevented the appearance of more than rehashed daily journalism.

The novelists, as usual, proved prolific. Somerset Maugham retained his customary felicitous sentimentality, and *Up at the Villa,* although far beneath his best, was pleasantly enough turned. Elizabeth Bowen, too, displayed her delicate if hypersensitive talent in *Look at All Those Roses;* and Virginia Woolf's last novel, *Between the Acts,* was a worthy memorial of an unusual writer. Of the rest, *Manhold* by Phyllis Bentley, *The Bay* by L. A. G. Strong, *Proceed, Sergeant Lamb* by Robert Graves, *The Ocean* by James Hanley, *Conquer* by John Masefield, all provided what we have come to expect from their authors.

The fourth quarter of the year was proportionately more productive than the preceding three. T. S. Eliot's *The Dry Salvages* was the most important poem of the year, and showed its author's increasing metaphysical preoccupations. Aldous Huxley, too, continued to pursue his philosophic hare, and in *Grey Eminence,* a polished and acute historical biography, his first essay in the genre, argues over again the problem of means and ends. *The Empty Room,* Charles Morgan's little novelette, seemed also to carry some underlying message, but the critics were unable to agree as to what precisely this might be. Both H. G. Wells and Wyndham Lewis published new novels, but neither of them succeeded in enhancing their previous reputations. In another field, Dr. Rostovtzeff at length published his *Social and Economic History of the Hellenistic World.* (*See* AMERICAN LITERATURE; PUBLISHING [BOOK].) (J. MR.)

Entomology.

During times of peace, entomologists are concerned chiefly with teaching and research work having to do with the general routine of economic entomology, medical entomology, horticultural quarantine and investigations in history and systematics.

The enormous losses inflicted on man's food supply during normal conditions amount to several billion dollars in the United States annually, and a large staff of research and field men is employed to cope with the various unpredictable situations as they arise.

In wartime the many activities of entomologists are either greatly modified or completely changed and are concentrated chiefly along the lines of food production and conservation and toward camp and personal sanitation and the prevention and control of tormenting or disease-bearing insects. Some of the specialized types of practical work and research investigations may be briefly summarized in these pages.

Increase and Preservation of Food Supplies.—It is obviously important to produce as much food as possible and every effort was being made in 1941 to prevent and reduce losses due to insect infestations of the growing crops. Special programs were inaugurated to deal with such injurious insects as grasshoppers and locusts, cutworms and army-worms, chinch bugs, the Hessian fly, potato beetle, codlin moth, cotton boll weevil and a host of other insects that yearly destroy 5% to 20% of the crops of American farmers. Many peacetime activities were abandoned to unite the efforts of agricultural extension specialists, leaders of farmers' organizations, entomologists of agricultural experiment stations, colleges of agriculture and employees of state, county and city governments throughout the entire United States. Of even greater importance is the proper storage and preservation of foodstuffs following harvest and especially the products being supplied to army cantonments and shipped overseas to the Allies. Losses occasioned by stored product insects such as grain moths, beetles, weevils and mites, although tremendous during normal times, are unbelievable under war conditions. The devastation of vast stores of wheat by insects and rodents during World War I prompted the British in 1940 to adopt drastic measures to preserve every pound of wheat, beans, peas, dried fruit, cured meat and other essential food products that were raised in or shipped into the United Kingdom. Accordingly, all the entomologists available were detailed to the tremendous task of food protection. The bureau of entomology and plant quarantine, United States department of agriculture, issued a large series of special circulars dealing with subjects pertinent to the national defense program. Topics treated in these circulars were: chiggers, bed-bugs, cockroaches, fabric insects, fleas, house-flies, stable flies, screwworms, horse bots, food insects, fumigation, lice, mosquitoes, powder-post beetles and termites. To become really effective the work must be carried beyond the fields and points of storage to the supply depots of the army camps and aboard the ships of the navy. A large number of entomologists trained for this particular kind of work were available in 1941 for service in the quartermaster's department where this important work is centred. The routine involves the use of suitable tight containers for the food, such as barrels, cans, closed bins, sealed packages and cartons; and airy, well ventilated and dry storage and refrigeration facilities. In spite of all precautions that are generally taken, infestations are likely to appear, especially in products that are a year or more old. Although such contaminated food is unfit to eat, it often escapes detection until it literally crawls and the warehouses, kitchens and living quarters in the camps and depots become so thoroughly infested that all new and clean stores are infested immediately upon their arrival. In addition to the insects that actually breed and live in the food products, buildings and ships may also harbour such nuisances as cockroaches, ants, house-flies, fleas, bed-bugs, lice and other so-called vermin that add to the spoilage of food supplies and to the discomfiture of the inhabitants.

Under such conditions control measures are imperative. These require the supervision of an expert experienced in the uses of heat, cold storage and such fumigants as hydrocyanic acid gas, calcium cyanide powder, methyl bromide, chloropicrin, sulphur dioxide, naphthalene, paradichlorobenzene, ethylene dichloride, carbon tetrachloride, ethylene oxide and other chemicals. These fumigants cannot be administered without certain other complements such as tight compartments, bins, rubberized tarpaulins or special fumigating rooms and adequate gas masks for the protection of the operators. The conditioning of rooms and food supplies for fumigation requires knowledge, experience and skill. The net results of such pest control operations prevents loss of supplies and guarantees wholesome food.

Sanitation of Buildings and Grounds.—Although many of the camps and ships are newly constructed, it is surprising how quickly the insect pests move in with the men, supplies and equipment. Termites soon attack the wooden structures. Ants, cockroaches and flies are on hand immediately and cannot be ignored in the efforts to keep the men healthy and contented. Such insects require camp sanitation outside as well as inside the buildings. Garbage and sewage disposal should be considered in the light of insect control as well as a means of protecting health. The proper use of insecticides, including dusts, sprays, powders and vapours, heat and steam are sure to be required in every camp and ship occupied for more than a few weeks at a time.

Insects Affecting the Health and Comfort of Soldiers and Sailors.—Under this heading are included such insects as crab lice, body lice, fleas, bed-bugs and mosquitoes which infest the person, and some which may transmit serious diseases like typhus and trench fever. It is rather difficult to understand why lice for instance, always appear on soldiers concentrated in camps even though the establishments are new, whereas under normal conditions these insects are relatively rare even under the crowded conditions of large cities. One explanation is the lack of proper laundering and cleaning of the clothes and a lack of hot-water facilities, which are not often available in temporary camps. The solution of the louse problem was an almost impossible one during World War I, although the principles of delousing by steam, boiling water, hot air and fumigating were well known.

In European armies, especially in the German army, elaborate equipment has been perfected for the treatment of clothing by the use of powdered cyanide. The proper amount sealed in a tin can is placed in the machine which automatically carries it into a small tight compartment which opens and empties the fumigant and a short time later delivers the garments, heated and aired, to the soldier who has emerged naked from a spray treatment which ensures him a clean body and pest-free clothes. The bedding and all sleeping and personal effects, and the barracks as well, are fumigated or otherwise treated for lice, bed-bugs and fleas by the judicious use of dry heat, hot water, live steam, chemical dusts and sprays, fumigation, cold or hot storage or exposure to the sun. Body treatment consists in closely clipping the hair and in the use of mercurial ointments, mixtures of equal parts of kerosene and olive or other vegetable oil or kerosene and vinegar, special chemical soaps, oil and soap emulsions, and a powder composed of 3% rotenone, 96% naphthalene+2% creosote+2% iodoform. The clothing, blankets and other woollen fabrics and furs may be protected from attacks of clothes moths and carpet beetles by moth-proofing with chemicals, the constant liberal use of naphthalene and para-dichlorobenzene crystals, refrigeration and cold storage, fumigation and frequent exposure to the hot rays of the sun.

Bed-bugs may be eliminated by fumigation with hydrocyanic acid gas, heating to 125° F. to 130° F. for 12 hr. and by spraying the bedstead, walls, floors, ceiling and furniture with light petroleum oils.

The Mosquito Problem.—The avoidance of mosquito-infested areas should be a prime consideration in the establishment of permanent or even temporary camps for soldiers or civilians and much care and good judgment should be exercised with regard to this matter. In the subtropical and tropical regions mosquito-free areas are not always available, but there is always the possibility of selecting places with the lowest populations or with the greatest opportunities for mosquito control. Such places should be either far from swamps, standing fresh or brackish water, or sufficiently elevated to permit drainage and the elimination of standing water. Otherwise great expense must be incurred in order to fill low places and pump out the standing water, clear away aquatic vegetation, to treat the water with light oils, Paris green, borax, pyrethrum and other insecticides and to afford protection to the men by means of repellent sprays and ointments, netting, screening and other safeguards.

Extension Entomologists and the National Defense Program.—In 1941 the extension entomologists were making distinct and valuable contributions to the knowledge of insect control by the many different approaches to this problem which they employed in the multitudinous problems that were confronted in the farming communities throughout the entire United States. Some of the features of the defense which they emphasized in the national defense program were: (1) Preparedness in insect control—to outline the objectives and the methods of operations and to assist the farmers in procuring in advance the proper equipment and insecticides to meet the emergencies as they arose. (2) An all year-round educational program concerning the injurious insect pests in the various communities and a familiarization with the latest recommended practices and the distribution of practical and technical information in printed form. (3) Programs emphasizing the importance of agricultural practices in reducing losses caused by insects and instructing farmers how to reduce or eliminate pests by cultural methods, crop rotation, growing insect-resistant varieties of plants, farm sanitation, most effective times of planting and harvesting and by the protection of crops in storage. (4) The use of exhibits, conducting special caravans and visits to familiarize the farmers with the insects, their depredations and means for their control. (5) Proper recommendations as to amounts of injury and infestation by insects warranting the application of control measures. (6) Assisting the farmers in connection with insect problems in relation to domestic animals, members of the family and the household in general—and especially aiding in obtaining better and more healthful sanitary conditions for humans and animals on the farm. (7) Extending the scope of agricultural activities to include the production of honey and beeswax and the benefits derived in the pollination of agricultural crops.

Insect-Resistant Plants.—For many years agriculturists and entomologists have been selecting and breeding plants that show resistance to the attacks of various insects. Packard in 1941 showed that Hessian-fly-resistant wheats have been observed in America since 1781 and that thousands of varieties of wheat have been tested and promising selections have been made from such well known varieties as Dawson, Karovale, Marquillo and also from countless other breeding strains. It is worthy of note that Hessian fly resistance is transferable according to the laws of genetics from spring to winter wheat and vice versa without obtaining objectionable features and that resistance to fly may be successfully combined with resistance to fungus diseases in a single homozygous line.

Wheat varieties were also known that are resistant to the chinch bug, the wheat stem maggots, fruit fly and jointworms.

Selections of alfalfa were reported to be resistant to the potato leaf hopper and to the pea aphid.

Codlin Moth Control by Organic Insecticides.—Attempts to find substitutes for the heavy metal insecticides in codlin moth control resulted in a vast amount of investigational work in North America since 1932. Organic substitutes which have given some promise are extracts of nicotine, pyrethrum, phenothiazin and xanthane, and combinations of these extracts with petroleum and fish oils, bentonite and other materials. The pyrethrum and phenothiazine extracts have not proven as satisfactory as the other extracts.

The Fowl Malaria Organism.—The fowl malaria organism, *Plasmodium gallinaccum* Brumpt, may possibly be transmitted by the European mosquito, *Culex quinquefasciatus*, according to experiments of Vargas and Beltrain, who dissected sporozoites of the parasite from the salivary glands of this mosquito reared in the laboratory.

Sheep Tick Problem in Great Britain.—The sheep tick, *Ixodes ricinus* Linn., causes losses up to 50% of sheep not acclimatized to the diseases known as louping-ill and tick-borne fever. The tick is able to survive on a variety of hosts in the absence of sheep and is well adapted to the moorland and hill regions where it is active in spring and early summer and again in the fall.

Derris dusts afford protection for a period of two weeks for lambs, and a dip composed of either a 0.2% arsenious oxide or 0.02% derris resin is effective on adult sheep for a period of 10–14 days.

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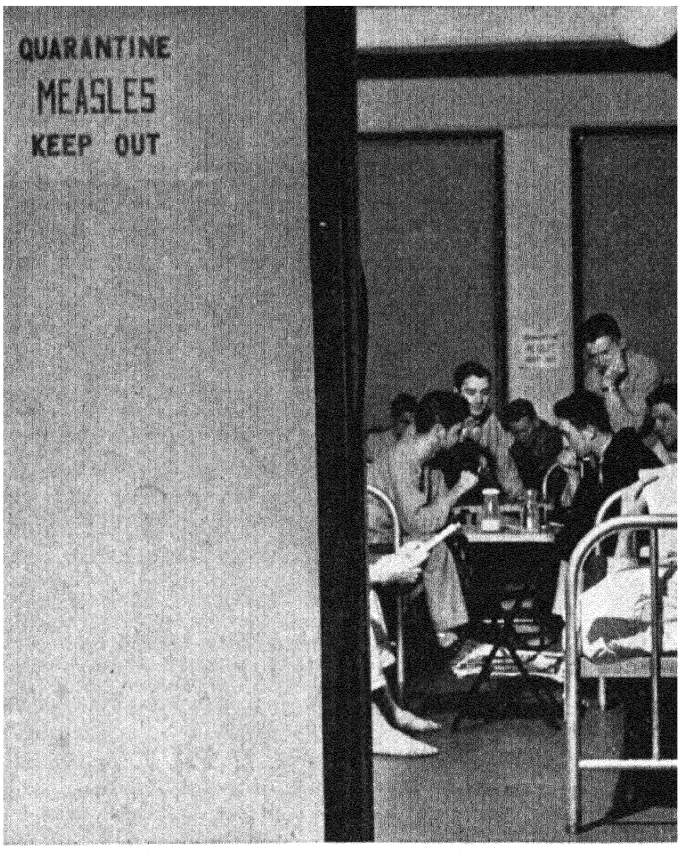
(E. O. E.)

Enzymes: *see* BIOCHEMISTRY.

Epidemics and Public Health Control.

For the first time, Cox *et al.* reported the finding of the virus of the western strain of equine encephalomyelitis in a host other than man and horses.



AN EPIDEMIC OF MEASLES and scarlet fever broke out at Chanute field of the army air forces at Rantoul, Ill. in March 1941. Similar outbreaks occurred in other U.S. camps during the year

The virus was isolated from a prairie chicken near Rugby, N.D.

In a study of the vectors of equine encephalomyelitis in Massachusetts, Feemster and Getting found the *Aedes Vexans* mosquito to be the most important vector. The peak of incidence of these mosquitoes is late in August.

Piszczek *et al.* in investigating an outbreak of poliomyelitis in Cook County, Ill., found the virus of this disease in healthy children who were in contact with adult members of their families who became ill with infantile paralysis. This established the existence of healthy carriers.

Influenza.—Horsfall *et al.* used a complex vaccine against influenza A. In volunteers who had received a single subcutaneous injection of complex vaccine of good antigenic potency four months previously, the incidence of influenza A during an epidemic was 50% lower than among unvaccinated individuals in identical environmental circumstances. The incidence of influenza of unknown cause was not significantly different in the two groups. The complex vaccine used was a preparation containing the influenza A virus plus the X strain of canine distemper virus.

Two types of specific virus have thus far been isolated; namely, influenza A and influenza B. These two types, however, have not been the cause of all reported influenza cases. There are still cases of influenza of unknown etiology.

Pneumonia.—Felton *et al.*, in a study on immunizing substances in pneumonia, conclude that active immunization against pneumonia is not practicable on a large scale, although rapid strides toward this goal are being made. In this particular study, Felton and his coworkers established the optimum antigenic dose of polysaccharide of types 1 and 2 pneumococcus as measured by serum protective antibody titre.

Bacillary Dysentery.—In the treatment of acute bacillary dysentery, Lyon had excellent results with sulphanilylguanidine. The drug was given in milk or water suspension, each patient receiving .1 gm. per kilo body weight as the first dose and then .05 gm. per kilo every four hours. It was found that this drug could be given in big enough doses to saturate the intestinal contents and still keep the blood concentration down to 1.4% mg.

Tetanus.—Hall in studying the effectiveness of tetanus toxoid, pointed out that tetanus had not been reported in an inoculated individual.

Rheumatic Fever.—John R. Paul, in a study of rheumatic fever, pointed out that rheumatic fever is in a position of importance ahead of all other chronic infectious diseases, with the exception of tuberculosis and syphilis. Rheumatic fever is due to the faulty disposal of streptococcus haemolyticus within the rheumatic or potential rheumatic patient. Rheumatic fever is considered to be a "crowd" disease. Intimately related to the prevalence of heart disease are the problems of malnutrition, crowding, uncleanliness, poor ventilation and the presence of vermin. Rheumatic fever is definitely a family disease. In families with rheumatic fever, the prevalence is twice as high as in nonrheumatic families. In rheumatic families, 10% of exposed persons are affected as against 3% in nonrheumatic families. This suggests a hereditary influence. (*See* also BACTERIOLOGY; ENTOMOLOGY.)

(H. BU.)

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Episcopal Church: *see* PROTESTANT EPISCOPAL CHURCH.

Equatorial Islands: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Eritrea: *see* ITALIAN COLONIAL EMPIRE.

Espionage: *see* FEDERAL BUREAU OF INVESTIGATION.

Estonia. One of the Baltic states of northeastern Europe, north of Latvia, south of Finland, formerly a republic; became part of Germany's "Ostland" in 1941. Area, 18,371 sq.mi.; pop. (est. 1939) 1,122,000. Chief towns: Tallinn (capital, 145,000); Tartu (60,800); Narva (24,500); Nomme (21,900); Pärnu (21,800). Language, Estonian (a Finno-Ugrian tongue). Religion, Christian (Lutheran 78%, Greek Orthodox 19%). Ruler at the end of 1941: the German reich through Reichscommissar H. Lohse of the Ostland and a local council.

History.—Behind the events of 1941 in Estonia and the other Baltic states one must remember the sequence of events after Sept. 29, 1939, when Estonia signed her "treaty of mutual assistance" with the U.S.S.R. and granted garrison privileges to the Red army. Immediately after June 15, 1940, the Russians definitely occupied the country, perhaps forestalling a German putsch. On July 15 Estonia "voted" to apply for membership in the U.S.S.R. and in August was accepted as the 16th soviet republic. Until the summer of 1941, Estonia remained under soviet domination. It is clear that collectivization was not completed in this one year of control, but the status of some of the larger farms and factories was changed. Goods from Estonia appeared in the markets of Moscow, and the economy of Estonia was evidently being reoriented. Although reports were lacking in 1941, except through German sources, it would appear that the soviet occupation was disillusioning to say the least.

When the Germans struck against the U.S.S.R. on June 22, 1941, Estonia's geographic position delayed the struggle there for a short time. The Germans struck from the south, through Latvia, and aimed directly at Leningrad, by-passing Tallinn and the whole northwest portion of Estonia. In August, as the attack on Leningrad settled into a siege, the nazis turned strongly on the Russian forces threatening their flanks. After repeated attacks, with shelling from land and bombing from the air, the Germans announced the capture of Tallinn on Aug. 29. They claimed to have sunk some 60 Russian transports and other naval vessels in an evacuation claimed to be a "new Dunkirk." Repeatedly thereafter German reports talked of the taking of the islands to the west of Estonia, but fighting continued, and apparently Russian garrisons still held out on Oesel and Dagoe at the end of 1941.

Politically the Estonian picture was both chaotic and incomplete at the beginning of 1942. A five-man council of Estonian nazis was set up under German direction, each man to be known as a "fuehrer" rather than minister. The new invaders, of course, got factories back into operation as quickly as possible, but the difficulty of conditions was illustrated by the fact that as late as November there was no regular postal service with Germany. Railways which operated on the Russian broad gauge were being changed to the western European standard. The German Commerz bank opened a subsidiary in Tallinn. Administration centred in Riga, where Reichscommissar Lohse established himself. Seemingly the entire area of the German conquests from the U.S.S.R. was to be put under the direction of Alfred Rosenberg, whose appointment on Nov. 17 barely antedated the beginning of the general nazi retreat. Things were very much in flux as the year 1942 dawned in the north. (*See* also WORLD WAR II.)

No statistics relating to education and economic conditions in Estonia were issued after Russian occupation of the country in June 1940. The latest statistics available at the end of 1941 were for 1939 or earlier years.

Education.—In 1937–38 there were 1,224 elementary schools, 58 middle schools, 39 technical schools and 30 agricultural schools. Tartu (Dorpat) university had 3,219 students and 217 professors in 1938.

Finance.—The monetary unit is the kroon (26.7 U.S. cents at par). Effects of German monetary changes in 1941 were uncertain. Revenue (est. 1939–40) 99,293,000 kroons; expenditure 99,293,000 kroons.

Trade and Communication.—Imports in 1939 totalled 101,351,000 kroons; exports 118,217,000 kroons. Principal imports were raw cotton, sugar, woollen yarns and thread, iron and steel. Principal exports were butter, wood and paper, cotton goods, cellulose, flax and tow, meat products and eggs. Imports were chiefly from Germany, Great Britain, Sweden, the United States and the U.S.S.R. Exports were chiefly to Great Britain, Germany, Finland, the United States and Sweden.

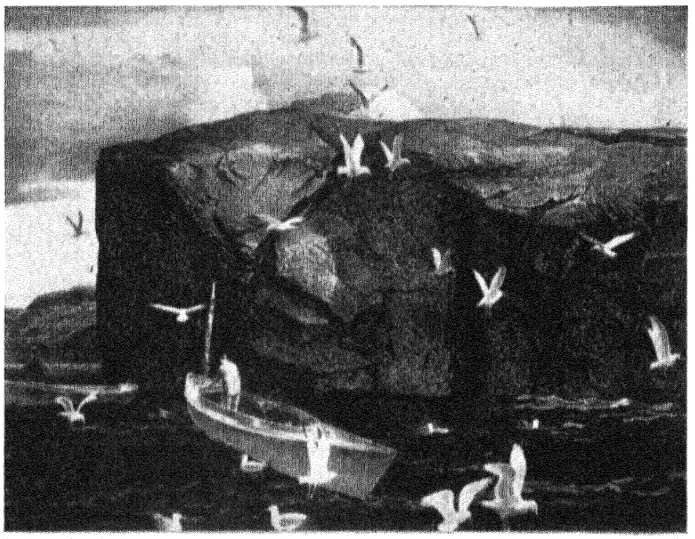
Agriculture.—Production (in short tons) of the leading crops in 1939 was as follows: rye (250,994), potatoes (963,741), oats (164,684), barley (99,207) and wheat (94,026). Estonia in 1938 had 660,890 cattle, 649,730 sheep, 384,580 pigs, 219,020 horses and 1,596,570 chickens.

Manufacturing and Mineral Production.—Manufacturing production was valued at 166,238,000 kroons in 1937. One of the larger cotton mills in Europe is at Narva, where textile manufactures in 1937 were valued at 47,425,000 kroons. Other important industries are paper and wood, food products, cement, flax, leather. Shale oil production rose rapidly to 209,437 short tons in 1939. Approximately 60,000 people were employed in industry in 1938. (F. D. S.)

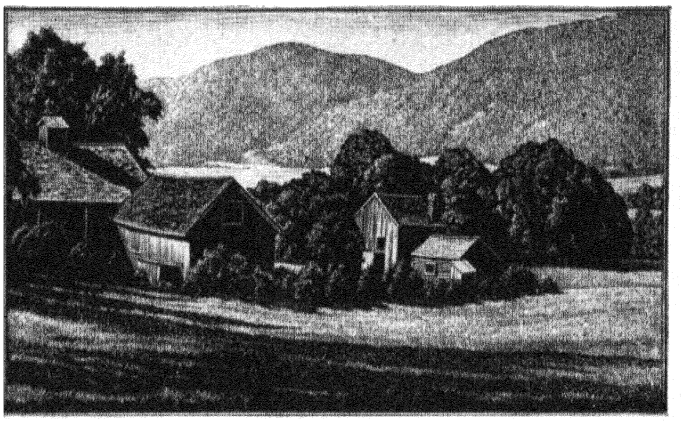
Etching. Since artists are primarily concerned with the spiritual expression of a people, they are the first to feel, and their work the first to reflect, such a cataclysmic upheaval as that of World War II. In the dictator-ridden countries, where free thought was suppressed, all art that did not conform to the regimentation of a set formula could only find covert expression, and since art is essentially free it may be said to have perished, for the moment, in these lands. And, though in those countries where the democratic way of life still persisted all forms of creative expression were stimulated rather than otherwise by the conflict (England being a notable example), the necessarily increased difficulties of communication militated against international exchange. In the United States the artists, barred from direct contact with other countries except as such had been effected through refugees from them, turned inward upon their own land with increasing interest, and this brought about a tremendous stimulus to the national element in their production. What effect upon this strictly American art the influx of refugee artists have is a matter of great interest to all those concerned with the future life of the U.S., but it can only be revealed by the passage of time. So well developed along national channels has American art become, however, that it is more than possible the influence may be reversed, and that, instead of American art being profoundly influenced by the artists of foreign lands who have sought safety and the right to live freely, Americans may be the ones who influence them.

The country by country review of current European etching that has been made in these pages in the past must necessarily be omitted for 1941. Spain, Italy, the Scandinavian countries, Poland, Hungary and Czechoslovakia, where etching, as a means of creative expression, still existed, even though it could not flourish, immediately prior to 1941, were all so deeply and tragically involved in the chaos of war that it is safe to say art was practically dead within their borders, though that it would revive when peace ultimately returned is inevitable.

France.—In unoccupied France those etchers who survived June 1940 carried on as best they might in the face of their struggle for very existence, but who they were, where they worked and what they created was not known.

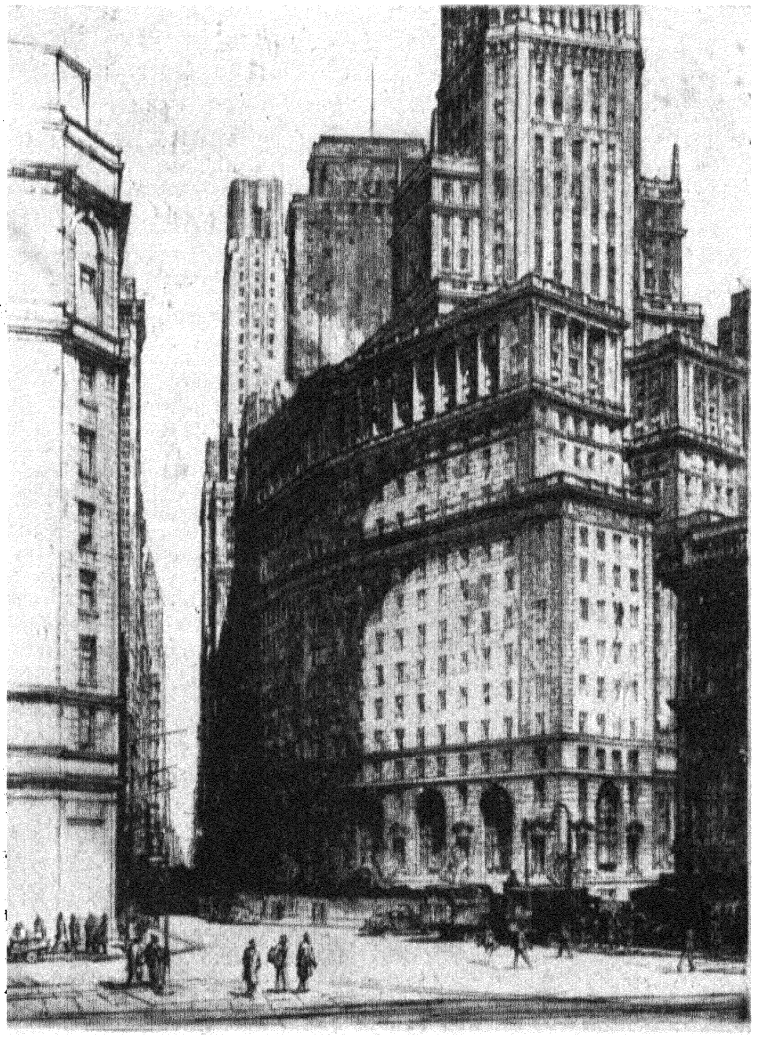


LITHOGRAPH by Stow Wengenroth: "Deep Water"

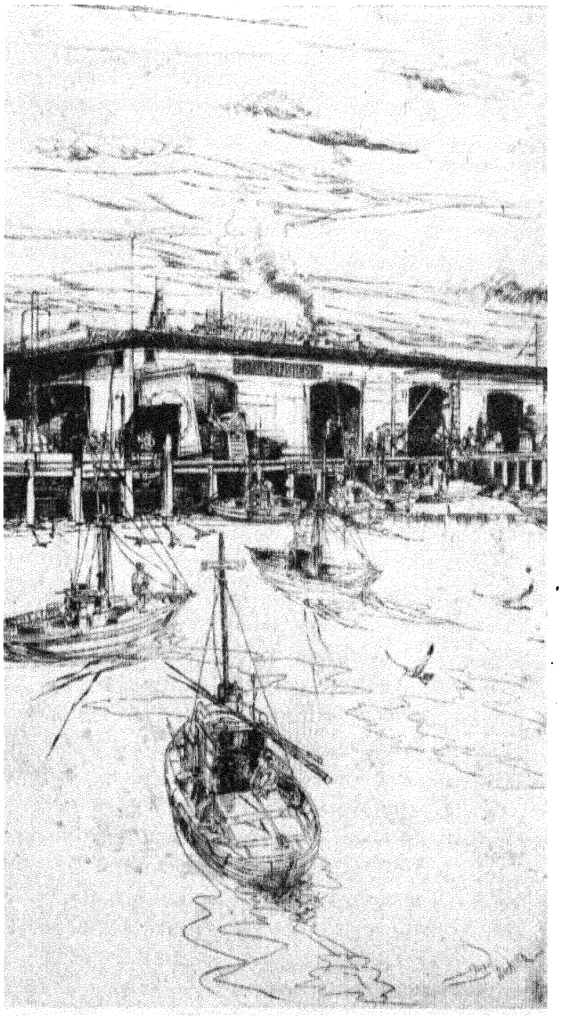


'DISTANT HAZE" (Essex county, N.Y.), wood engraving by Asa Cheffetz

"BOWLING GREEN, NEW YORK," dry-point by Louis C. Rosenberg



"STANDARD FISHERIES," etching by John W. Winkler



India.—It is worthy of note that in India the veteran etcher Mukul Dey, for long the leading exponent of this form of expression in that country, published new prints in 1941. As far as art is concerned, the countries of the far east were silent.

Great Britain.—In spite of the sacrifices demanded of the people of Great Britain by their country, British etchers managed to produce new work in 1941. Many were making pictorial records of war activities, first-hand documents for posterity, both at the front and in shipyards and munition works at home. Exhibitions were held as usual and both the Royal academy and the Royal Society of Painter-Etchers and Engravers displayed many etchings in their annual shows.

Latin America.—Latin-American art continued to attract attention in the United States, due to the closer relations developing between the countries of the western hemisphere. The woodcut and the lithograph remained the most popular forms of graphic expression south of the Rio Grande, though Uruguay, Venezuela, Argentina and Mexico all boasted native etchers who were producing significant work.

United States.—In the United States all the established etchers published work during 1941, while many new names appeared in print exhibition catalogues. In addition, numerous refugee artists from Europe showed their work. A list of all etchers active in the U.S. during the year would be too long to print in this article. Not only have the old established print societies which number many etchers in their memberships—as the Society of American Etchers in the east, the Southern Printmakers in the south, the Chicago Society of Etchers, the Prairie Printmakers in the mid-west, the Southwest Printmakers, the Printmakers Society of California, the California Society of Etchers, the Rocky Mountain Printmakers and the Northwest Printmakers in their respective parts of the country—held their annual and their travelling exhibitions as usual, but new groups were formed as the interest in fine prints spread. The entry of the United States into the war, at the end of the year, would, it seemed, enlarge the activities of these organizations rather than otherwise. The American National Committee of Engraving in 1941 had 17 print shows circulating throughout the United States and abroad, among them being exhibitions of Hawaiian, Mexican and Uruguayan prints; an exhibition of Graphic Art of the Western Hemisphere assembled for the International Business Machines corporation, which attracted 50,000 visitors in three days when shown in Montevideo; the exhibition of Prints by British Artists in Service, which had been travelling throughout the United States and its possessions for more than a year and the proceeds from whose sales went in toto to the artists involved; and a survey of contemporary American prints shown at the Carnegie institute in Pittsburgh. Other travelling print shows including etchings, and sponsored by this organization have been National Trends in Printmaking, Seventy-Five Miniatures, Vanguard Prints, and Print Processes. An interesting and gratifying development in contemporary American printmaking has been the union of art and industry as effected by the policy of the International Business Machines corporation under the enlightened and progressive leadership of Thomas J. Watson. The National Academy of Design and the WPA continued very active in their sponsorship of graphic art.

The principal graphic art society in Canada, the Royal Society of Canadian Painter-Etchers and Engravers, maintained its activities in the face of war pressure. (J. T. AR.)

Ethical Culture Movement.

A religious fellowship, founded in New York in 1876 by Felix Adler, and in London in 1886 by Stanton Coit. Acceptance of a common theological creed is dispensed with. The basis is "dedication to the ever-increasing knowledge, love and practice of the Right." Extension of ethical knowledge is considered equally important with improvement of practice in personal, social, political, national and international relations. The American movement was represented in 1941 by active societies in New York, Chicago, St. Louis, Philadelphia, Brooklyn, and by groups in West Chester and elsewhere. These were united in the American Ethical union (secretary, George E. O'Dell; headquarters, 2 West 64th st., New York), which holds periodical conferences and publishes a monthly magazine (*The Standard*) and other literature. The Ethical Culture movement pioneered in establishing social settlements, district nursing and legal aid to the poor, housing reform and improved methods of education. In 1940–41 much work was done in aiding refugees from Europe. The New York Ethical Culture society organized the Good Neighbor committee (interdenominational) for this and other co-operative purposes. Summer "work-camps," in which young people of different national and cultural origins are assembled, were conducted as experiments in democratic living, to supplement winter studies for the understanding and defense of American institutions. In 1941 considerable aid was given to the English Ethical societies which suffered by bombing in London. These were organized in an Ethical union (chairman, Lord Snell, 12 Palmer st., London, S.W.1).

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Ethiopia.

A kingdom of northeast Africa. Area, *c.* 350,000 sq.mi.; pop. (est. Dec. 31, 1939), 9,500,000; capital, Addis Ababa; religions, Christian (Copt) and Mohammedan; languages, Amharic and Arabic; ruler, Emperor Haile Selassie I.

History.—The small British mission which slipped across the frontier in Aug. 1940 set up its headquarters in Gojjam and, promulgating the emperor of Ethiopia's proclamation, succeeded during the following five months in its plan of containing within the confines of Ethiopia such Italian forces as might have been used for further attacks on the Sudan and Egypt. Early in 1941 the emperor, Haile Selassie, re-entered his country. Crossing the Sudan-Ethiopian border south of Gallabat on Jan. 15, he made his way, with the assistance of Ethiopian patriot forces supported by units of the Sudan defense force and an Ethiopian battalion raised from Ethiopian refugees, to the plateau country in the west of Gojjam.

As a result of the harassing tactics of these forces and of the fear that their own line of retreat might be jeopardized, the

EXILED SINCE 1936, Haile Selassie re-entered Addis Ababa May 5, 1941 and received the homage of his subjects

Italian garrison in Gojjam withdrew across the Blue Nile after evacuating their forts in Gojjam. Debra Markos was entered on April 4 by the emperor and his patriot army. Meanwhile British troops had been set in motion. In the north, Eritrea had fallen, after stubborn fighting at Cheren, to Gen. Platt and his army from the Sudan, which included British and Indian regiments as well as Sudanese. From the southeast a third attack was directed against Italian Somaliland by Gen. Sir Alan Cunningham (*q.v.*) and his South, East and West African army. The crossing of the Juba river by his troops led to the fall of Kismayu and Mogadishu, and the loss of these bases caused the Italians to beat a hasty retreat toward the railway line connecting Jibuti in French Somaliland with the Ethiopian capital. Within a few days Addis Ababa itself was declared an open town and was thrown open to the advancing British troops April 6.

The emperor re-entered his capital in state May 5, after an absence of five years. The duke of Aosta, governor general and commander in chief of Italian East Africa, retreated northward with the forces left to him, and, after a brief stand at Dessye, took up a strong position in the natural fortress of Amba Alagi. Encircled, however, from the north by the advance of Gen. Platt's army and from the south by the South African forces which, under Gen. Cunningham's command, had followed him closely up the road from Addis Ababa, the duke surrendered, after a preliminary bombardment, to the British on May 19. Meanwhile Italian positions to the south and southwest were being harassed by the combined guerrilla tactics of both patriot Ethiopians and British troops, and the situation in these districts took only a short time to clear up. By September the only pocket of Italian resistance left was in Gondar district, and on Nov. 27 the surrender of Gondar ended the East African campaign. (*See* also WORLD WAR II.) (C. SA.)

Trade and Communication.—Chief exports: hides and skins, coffee (13,000 metric tons in 1937–38) and gold. Roads (1940), *c.* 4,340 mi.; railways (Addis Ababa to Jibuti in French Somaliland), 486 mi.

European War: *see* WORLD WAR II.

Evans, Sir Arthur John (1851–1941), British archaeologist, was born July 8 at Nash Mills, Herts., Eng., the eldest son of Sir John Evans, one of England's great authorities on the neolithic and palaeolithic ages. Sir Arthur was widely known for his excavations in Crete in 1893 which resulted in important discoveries concerning the history of ancient Greece. He was honoured for his discoveries by academies throughout Europe; among his awards were the Royal Gold medal of the Royal Institute of British Architects, 1909; the Petrie medal, 1931; and the Copley medal of the Royal Society, 1936. He died at Youlbury, Boars Hill, Oxford, July 11. (See *Encyclopædia Britannica.*)

Events of the Year: *see* CALENDAR OF EVENTS, 1941, pages 1–16.

Eves, Reginald Grenville (1876–1941), British portrait painter, was born in London and was educated at University College school. In 1891 he entered the Slade School of Art. A protégé of the late John Singer Sargent, he was in demand as a portrait painter in British political and social circles. In 1931 Mr. Eves fell into disfavour in British art circles because three of his paintings sent to the Royal academy exhibition were discovered to be enlarged photographs painted over. Mr. Eves explained that he used this device as a timesaver when neuritis affected his arm. The sensation caused by this unique method of drawing delayed his election to the conservative Royal academy until 1939. His portraits of Thomas Hardy, Max Beerbohm, Sir Ernest Shackleton and Admiral Jellicoe hang in British museums. He died in Middleton, Teesdale county, Durham, England, June 14.

Exchange Control and Exchange Rates.

The United States and China occupied the centre of the exchange control stage during 1941. During the summer months, the governments of those two countries, in conjunction with the British, amended their exchange control systems in order to tighten their economic and financial blockade of the axis. Developments elsewhere were, by comparison, of a minor character; they consisted in the main either of geographical extensions of particular systems of control or of relatively slight modifications in the method of operation. The extension of U.S. "freezing" orders curtailed further the already restricted trading in foreign exchange in New York, by Jan. 1, 1942, the only important foreign exchange market; after July the New York Federal Reserve bank certified exchange rates on only British empire and Latin-American currencies, and practically all of these were subject to some sort of control. As an outgrowth of the widespread adoption of rigid exchange controls, there developed a sizeable market in New York for foreign currency notes, which were offered at a considerable discount under the official rates of exchange.

United States.—Exchange control in the United States progressed during 1941 from a merely defensive measure, designed to protect the assets in the United States of governments and nationals of invaded European countries from seizure by the invader, to an important instrument, first, of national defense and, later, of economic warfare. During the early months of the year, Bulgaria, Greece, Hungary and Yugoslavia were added to the list of frozen countries. On June 14 assets of continental European countries not previously frozen were blocked and an inventory of all foreign-owned assets in the United States, whether or not they belonged to blocked countries or nationals thereof, was ordered.

The inventory of foreign-owned property in the United States was expected to be the most comprehensive tabulation ever made of foreign-owned property in the United States. The inventory was designed to secure complete information on the actual foreign ownership, as well as on changes in nominee holders from June 1, 1940. Reports on nominal ownership both as of June 1, 1940, and June 14, 1941, were required in order to disclose any possible attempts at concealment of real ownership which might have been made between the two dates in anticipation of a general order blocking all foreign assets in the United States.

The United States blockade of the axis was tightened further by the issuance on July 17 of "The Proclaimed List of Certain Blocked Nationals." This and supplementary lists contained the names of suspected, unfriendly persons and firms in Latin America which were to be considered as blocked nationals under the provisions of the executive order of June 14.

On July 25 the United States freezing control was extended to non-European countries. Assets of Japan and China were blocked—the latter at the specific request of the Chinese National government. This step was clearly an aggressive measure taken at a time to coincide with further Japanese occupation of French Indo-China; the principal effect was to bring the trade between the United States and Japan to a complete stoppage. On Dec. 9 Thailand was added to the list of frozen countries, and on Dec. 26 Hongkong was blocked.

The mechanics of the U.S. foreign funds control remained basically the same as those originally introduced in the spring of 1940. Transactions affecting assets of blocked countries and their nationals were prohibited except as specifically authorized

Average Monthly Value of Foreign Currencies for Which Quotations Are Available, December 1940-November 1941

(In United States cents per unit of foreign currency)

Country	Unit of Currency	1940 Dec.	1941 Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.
Europe													
Finland	Markka	1.94	2.01	2.01	2.01	2.01	2.01	2.01	..	..	..	..	..
Germany	Reichsmark	39.98	39.98	39.97	39.96	39.96	39.96	39.97	..	..	..	..	..
Hungary	Pengö	19.77	19.77	19.77	19.77	..	..	..	..	..	..	..	..
Italy	Lira	5.04	5.04	5.04	5.04	5.04	5.08	5.26	..	..	..	..	..
Portugal	Escudo	3.99	3.99	4.01	4.00	4.00	4.00	4.00	..	..	..	..	..
Spain	Peseta	9.13	9.13	9.13	9.13	9.13	9.13	9.13	..	..	..	..	..
Sweden	Krona	23.82	23.82	23.83	23.82	23.82	23.83	23.83	..	..	..	..	..
Switzerland	Franc	23.20	23.22	23.22	23.21	23.20	23.20	23.20	..	..	..	..	..
United Kingdom (free)	£ Stl.	403.50	403.42	402.97	403.19	402.48	403.10	403.16	403.23	403.18	403.27	403.28	403.42
Yugoslavia	Dinar	2.24	2.24	..	..	..	..	..	..	..	..	..	..
America													
Argentina (special export)*	Peso	..	..	..	..	23.70	23.70	23.70	23.70	23.70	23.70	23.70	23.70
(free)		23.58	23.64	23.58	23.09	23.36	23.09	23.69	23.75	23.81	23.64	23.58	..
Bolivia	Boliviano												
(free)		1.63	1.66	..	1.65	1.72	1.76	1.87	1.98	1.98	2.00	..	..
(compensation)†		1.82	1.82	1.82	1.82	1.82	1.82	..	..	..	..	..	..
(official)†		2.50	2.50	2.50	2.50	2.50	2.50	2.39	2.15	2.15	2.15	2.15	..
Brazil	Milreis												
(free)		5.02	5.06	5.06	5.05	5.06	5.06	5.06	5.06	5.06	5.06	5.08	5.09
(curb)		4.86	4.82	4.88	4.89	4.89	4.91	4.96	5.10	4.96	4.90	4.91	..
Canada (free)	Can. $	86.56	84.80	83.68	84.98	87.65	87.42	88.18	88.27	88.90	89.13	88.78	88.60
Chile	Peso												
(export draft)		4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	..
(free [D.P.])		3.21	3.21	3.21	3.10	3.21	3.21	3.21	3.21	3.21	3.21	3.21	..
(official)		5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	..
Colombia	Peso												
(free)		52.35	51.81	52.08	52.08	52.01	52.01	53.76	54.05	54.34	55.55	..	..
(official)		57.13	57.14	56.98	56.98	57.01	57.02	56.98	56.98	56.98	56.98	56.98	56.99
Cuba	Peso	.91	.92	.93	.94	.96	.98	.99	.99	.99	1.00	1.00	..
Ecuador	Sucre	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	..
Mexico	Peso	20.44	20.50	20.52	20.52	20.53	20.53	20.53	20.54	20.53	20.54	20.56	20.54
Peru (free)	Sol	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	..	..
Uruguay (free)	Peso	39.48	39.49	39.65	39.56	40.06	41.16	42.70	43.79	43.74	43.84	45.80	48.12
Venezuela‡	Bolivar												
(free)		..	..	..	..	..	..	..	..	27.10	27.32	26.52	..
(controlled)		..	31.34	31.34	31.34	31.34	31.34	31.34	30.96	29.85	29.85	29.85	..
Other													
Australia (free)	£ Austr.	321.50	321.50	321.11	321.30	320.70	321.19	321.25	321.31	321.28	321.33	321.36	321.43
British India	Rupee	30.18	30.14	30.14	30.14	30.13	30.12	30.12	30.12	30.13	30.13	30.15	30.15
British Malaya	Sing. $	47.10	47.08	47.09	47.11	47.10	47.10	47.13	47.16	47.16	47.16	47.16	47.16
China (Shanghai)	Yuan	5.69	5.39	5.42	5.36	5.19	5.25	5.33	5.24	..	..	..	..
Hongkong	H. K. $	23.58	23.64	24.14	24.42	24.39	24.28	24.37	24.52	25.11	25.09	25.08	25.08
Japan	Yen	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	..	..	..	..
New Zealand	£ N. Z.	322.75	322.75	322.36	322.55	321.96	322.45	322.51	322.57	322.54	322.60	322.63	322.70
Union of South Africa	£ S. A.	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00

*Special export rates for U. S. dollars in terms of Argentinian pesos reported in addition to official rate, beginning March 27, 1941.
†The compensation and controlled rates on U. S. dollars were combined by decree of June 21, which established a single controlled exchange rate in Bolivia.
‡Two types of exchange were set up under decree of July 23, modifying the Venezuelan exchange control system.

in the regulations and licences issued by the United States treasury. Special licences were usually issued, if there was reasonable certainty that the axis would not benefit from the transaction for which the licence was requested, and if it appeared that the blocked national would suffer were the licence denied. General licences were issued to cover transactions which, because of their nature or because of some characteristic of the owners, could be treated as a class. For example, general licence 11 permitted blocked nationals to withdraw funds not to exceed $500 in any one month for necessary living, travelling and similar personal expenses in the United States, while general licence 53 permitted all transactions ordinarily incident to the importing and exporting of goods between the United States and the generally licensed trade area provided the transaction was not by or on behalf of any blocked country or national thereof not within the generally licensed trade area or any person whose name appeared on the Proclaimed List of Certain Blocked Nationals.

Orient.—With the active co-operation and assistance of the American and British governments (and to a lesser extent of other Allied governments), the Chinese National government was able to strengthen materially its control over the foreign exchange transactions of the unoccupied areas of China. Simultaneously with the freezing of Japanese assets, the United States and Great Britain blocked Chinese assets under their jurisdiction. This measure gave the Chinese National government some control over the dollar and sterling assets of Chinese residents, including those in Shanghai, and thereby facilitated the closing of that centre as a leak for Japan in the Chinese exchange control system.

On Aug. 18 the Chinese Currency Stabilization board, which was set up under stabilization agreements signed in April with the United States and Great Britain, authorized 14 licensed banks in Shanghai to provide dollar or sterling exchange for normal trade requirements at official rates. These banks had agreed to cease operations in the free market in return for an undertaking by the stabilization board to provide them with dollars and sterling at fixed rates and within certain limitations in respect of permitted imports. The rates were fixed at 3 5/32 pence and 5 5/16 cents to the yuan, giving a cross dollar sterling parity of 4.04, the official buying rate for pounds sterling in New York. This undertaking narrowed the market in Shanghai for free exchange and, for the first time since March 1938, strengthened the position of the Chinese yuan against speculative operations. By a series of decrees and regulations, operations in the free market were confined by the end of 1941 to clearing import bills not covered by a licence from the Chinese Foreign Exchange Control commission. This commission was set up in September to pass upon individual applications for exchange. This system of licensing each individual transaction involving the expenditure of either U.S. dollars or sterling exchange enabled the Chinese National government to prevent exchange disbursements of free China from making their way into Japanese or Japanese-controlled channels. This was not possible before, when efforts to support the Chinese yuan had to be made in the free market.

Japan immediately retaliated for the freezing of Japanese assets abroad. On July 26 a freezing ordinance was announced which provided that designated foreign nationals might not acquire or dispose of certain property or perform certain acts, except by permission of the ministry of finance. Orders freezing the assets of U.S., British and Dutch nationals in Japan were immediately issued under the above order. This was shortly followed by similar orders of Japanese-sponsored governments in occupied areas of China.

The Japanese freezing orders had been preceded during the early months of the year by a number of measures designed to tighten the Japanese exchange control system so as to provide exchange for imports from non-yen countries. In Feb. 1941 the Japanese foreign exchange law was amended giving the government authority to order Japanese nationals to sell their foreign assets, and also giving the government authority over the acquisition and disposal of property in Japan by foreigners and foreign corporations. On March 24 the finance minister issued a decree requiring all holders of blocked assets outside the yen-bloc to submit monthly reports to the ministry of finance giving full information regarding such assets. The reason given for this action was to enable the Japanese government to protect these assets through diplomatic negotiations.

Effective June 1, Japan instituted a system to stabilize the yen-sterling exchange. This was to be accomplished by centralizing all forward exchange operations in sterling and sterling-allied currencies (British, Australian, Egyptian, South African and New Zealand pounds, Straits and Hongkong dollars and Indian rupees) in a collective account maintained by the Yokohama Specie bank. Under this arrangement, the Japanese government indemnified the foreign exchange banks and traders for losses incurred in connection with foreign exchange transactions in these currencies; all profits and losses accrued to the Japanese government. On July 1 this foreign exchange concentration system was extended to include operations in United States dollars and currencies of 11 other non-sterling countries: Philippine Islands, Canada, Brazil, Argentina, Netherlands East Indies, French Indo-China, Switzerland, France, Sweden, Germany and Italy. This measure centralized the whole body of foreign exchange transactions between the yen group and other currencies.

The Sterling Area.—The British government had established virtually complete control over Britain's foreign exchange transactions before the close of 1940; it had instituted rigid controls over exchange proceeds from

exports, had closed all but the smallest leaks for capital exports, and had virtually abolished the free market for sterling. This was accomplished through an extensive series of payments and clearing agreements; the effect has been to sectionalize Britain's exchange market and to canalize its international economic and financial transactions.

The year 1941 saw no major changes in the British exchange control regulations and procedures. To reduce the importation of British bank notes into the United Kingdom, the right to do so was restricted on Feb. 1 to bona fide travellers. To preclude temporary exports of capital, the regulations were amended in April to provide that, in the absence of a specific exemption from the treasury, satisfactory assurance must be given that payment would be received within six months before a licence to export would be granted. To stop the leakage of sterling through other parts of the empire into dollars or other "hard" currencies, all transfers of funds from the United Kingdom to other parts of the sterling area were made subject on June 16 to the same degree of control, and to the same procedure, as transfers to countries outside the sterling area. Leaks had previously been possible as a result of the freedom of transfer of sterling within the sterling area, together with the lack of uniformity in exchange control systems throughout the area.

To prevent evasion of the United States order freezing axis assets, by operating through dollar accounts emanating in London, Great Britain issued a regulation on June 15 prohibiting, except by prior permission of the Bank of England, all withdrawals of U.S. dollar balances held on behalf of persons not resident in the sterling area.

Apart from co-operative steps taken against the axis, the most important British exchange-control development during 1941 was the widening of the sterling bloc. The Belgian Congo and Ruanda-Urundi, territories under control of the council of defense of the French empire, Hongkong, Iceland and the Faroe islands were formally included during the year. Iraq, which because of political and military developments was excluded on May 6, was again brought in on Nov. 28. The British empire, excluding Canada and Newfoundland, together with Egypt and the Anglo-Egyptian Sudan, was the nucleus about which the sterling bloc developed.

On Jan. 21 the Anglo-Belgian trade agreement was signed. It provided for the inclusion of the Belgian Congo and Ruanda-Urundi in the sterling area at a rate of exchange of 176.625 Congolese francs to the pound. On March 29 an order was issued formalizing the temporary financial arrangements between the United Kingdom and the free French territories at the same rate of exchange. The entrance of these areas into the sterling bloc automatically extended to them the general scheme of exchange control operating in the United Kingdom. Iceland and the Faeroe islands also entered the sterling area on March 29; Syria and Lebanon entered in September. Hongkong was brought in on Aug. 1, in order to facilitate the joint Anglo-American-Chinese financial blockade of Japan.

On Aug. 16 Great Britain and the U.S.S.R. signed a financial agreement setting forth the terms of payment for trade between the sterling area countries and the U.S.S.R. Clearing machinery was subsequently established providing for the settling of balances quarterly, 40% in gold or U.S. dollars and 60% in sterling.

Some progress was made during 1941 toward eliminating the discrepancies between the various controls within the sterling area, and in bringing them into line with that of the United Kingdom. As a consequence of the tightening of the control systems and the narrowing of the free exchange market, the fluctuations in the "free" rates of exchange on the various sterling area currencies were negligible during the year and the margin between the free and the official rates was virtually nil.

Canada.—Only minor amendments were made in the Canadian exchange regulations during 1941; they were directed toward decreasing further the drain on Canada's U.S. dollar exchange resources and, to a lesser extent, toward diverting foreign exchange expenditures to sterling currencies.

Effective Jan. 1, 1941, travel abroad was prohibited except by permission of the Foreign Exchange Control board, and on Jan. 7 prepayment for imports was restricted. In January, arrangements were made with authorities of the British possessions in the western hemisphere to provide the necessary funds for travel to those areas via New York, and on Feb. 15 an order was issued authorizing the granting of permits to import certain goods from countries outside the sterling area, provided arrangements approved by the Exchange Control board had been made for payment for such goods in sterling. On July 25 Canada froze the accounts in Canada of residents of Japan and China.

Europe.—Changes in the exchange situation of continental Europe during 1941 arose out of a continuation and extension of earlier practices and policies. They were the financial counterpart of Germany's economic subjugation of areas directly or indirectly under its control. Unlicensed exchange operations in all continental European currencies were stopped in the New York market by the U.S. freezing order of June 14. The volume of exchange operations, of course, materially declined.

The lowering of import duties between various European areas, the relaxation of payment restrictions, the tightening of currency regulations, and the further extension of central multilateral clearing through the German clearing office in Berlin were the steps taken during 1941 to further the creation of a continental economic bloc under German supremacy. Effective Jan. 1, German goods imported into the Netherlands were exempt from import duties. On April 1 foreign exchange restrictions were removed and the German-Netherlands clearing accounts closed. This latter measure virtually established a regime of free payments and of free transfer of capital between the two countries; it did not disturb existing arrangements for clearing payments between the Netherlands and third countries through the Berlin clearing office. By proclamation of April 12, imports into Bohemia-Moravia from the Netherlands no longer required exchange permits.

The network of payments cleared through Berlin was widened during 1941. Arrangements were made during the year to clear through the Berlin clearing office payments between Belgium and five additional European countries, and also payments between Rumania and Greece and between Rumania and Yugoslavia on obligations arising after June 1. The terms of the Hungarian-German trade and clearing agreement reached in July have not been published (Jan. 1, 1942) but it is reported that the agreement provided for an enlargement of clearing account facilities. Four occupied territories (General Government of Poland, Norway, the Netherlands and Belgium) made regular use of the central clearing facilities in Berlin throughout 1941, and 12 formally independent countries (France, Italy, Slovakia, Hungary, Rumania, Yugoslavia, Greece, Bulgaria, Switzerland, Sweden, Denmark and Finland) used the facilities occasionally. No direct clearings between German-occupied countries were allowed.

Finland, by a law of May 9, confirmed the existing authority to regulate foreign exchange transactions and broadened the scope of the specifically authorized governmental activities in this field. The new law centralized all foreign exchange transactions in the Bank of Finland and empowered the bank to require the surrender or transfer of foreign currencies, gold or other metals.

A royal decree of June 20 extended until June 30, 1942 the Swedish foreign exchange law of 1939, granting a monopoly of foreign exchange and foreign security transactions to the National Bank of Sweden during a war crisis.

Latin America.—Large foreign purchases, particularly by the United Kingdom and the United States, of many industrial and agricultural raw materials produced in Latin America, were primarily responsible for the improved balance-of-payments position of most of the Latin-American countries during 1941. This improved balance-of-payments position was immediately and directly reflected in more favourable exchange conditions.

Increased sales of wool to the United States and of meat to the United Kingdom, coupled with a reduction of imports, accounted for the improvement in the foreign exchange position of the Argentine during 1941. The easier situation was manifested in the simplification and relaxation of the exchange control system. On July 1, 1941 Argentina abolished its exchange control office and also the prior permit system for a number of commodities which usually comprise about 80% of its imports. Under the old system a prior exchange permit was a prerequisite to importation; under the revised control, import permits were no longer required for purchases from the sterling area, from other countries employing blocked currencies, from contiguous territories, or for essential products from free exchange countries.

Higher coffee prices under the Inter-American Coffee agreement was an important factor in easing the Brazilian foreign exchange position during 1941. The unevenness of the improvement was due largely to the dearth of coffee export bills in the late spring and in August. At these times the market was cushioned by bills arising from exports of minerals, vegetable oils and other products.

By late spring of 1941, Bolivia's exchange situation was more encouraging than it had been; sufficient dollar exchange was available to meet practically all demands and, as a consequence, the curb market had virtually disappeared. By decree of June 21 a single exchange rate of 46 bolivianos to the dollar was established. Revaluation of gold reserves and foreign exchange holdings of the Central bank resulted in a profit of 184,000,000 bolivianos.

Peru had sufficient dollar exchange to meet all necessary mercantile and service requirements. In contrast to the easy dollar position, Peru was short of sterling during most of the year.

The Venezuelan exchange control system was modified by the decree of July 23, which established a legal exchange market in that country for the first time and depreciated slightly the controlled selling rate.

The plentiful supply of dollar exchange in Uruguay during the latter half of the year was reflected in the drop of the free rate to the lowest level in many years.

Chile sought a solution to its exchange difficulties by increasing the number of commodities coming in at the higher rate. Exchange at the higher free rate was adequate throughout the year but exchange at the lower export draft rate was scarce.

The exchange policy of British colonial possessions in Latin America was governed by British war needs and the control systems were patterned after that of the sterling area. Trade was directed toward the sterling area bloc and dollar exchange was made available for imports from the United States only if the commodities were deemed essential and could not be obtained from the British empire.

Cuba, the Dominican Republic, El Salvador, Guatemala, Haiti, Mexico, Panama and Peru were the only Latin-American countries which did not have formal exchange control systems. (*See* also GOLD.)

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Exchange Rates: *see* EXCHANGE CONTROL AND EXCHANGE RATES.

Exchange Stabilization Funds.

The most significant development in this field during 1941 was the establishment of the Chinese-American and the Chinese-British stabilization funds to stabilize the relationship between the Chinese yuan and the U.S. dollar and the British pound sterling, respectively. Separate, but closely parallel, agreements were signed in April between China and these countries. The agreements provided for the appointment by the Chinese government of a five-man board (three Chinese, one American [U.S.] and one British national) to manage the funds. Under the agreement with Great Britain, the British treasury

agreed to provide 5,000,000 pounds sterling in addition to the existing Sino-British Stabilization fund which was set up in 1939. The agreement with the United States called for the purchase by the U.S. Stabilization fund of Chinese yuan to the amount of U.S. $50,000,000, and for a contribution by Chinese government banks of U.S. $20,000,000 to the joint fund. The Stabilization board began operations in August.

An earlier, repeatedly renewed, arrangement between the United States and China, signed on July 14, 1937, also provided for stabilization operations in Chinese yuan.

The United States also entered into stabilization agreements with Mexico, Brazil and Argentina. The agreement with Mexico was signed on Nov. 19, and provided for the use of $40,000,000 of the U.S. Stabilization fund to stabilize the U.S. dollar-Mexican peso exchange rate; this undertaking has not yet (Jan. 1, 1942) gone into effect. The United States-Brazilian Stabilization agreement, signed on July 15, 1937, and modified on Sept. 2, 1938, is still active. The undertaking with the Argentine, signed on Jan. 1, 1941, was not operative (Jan. 1, 1942), because of the failure of the Argentine congress to ratify and confirm the agreement. Under this arrangement, $50,000,000 of the U.S. Stabilization fund was set aside to promote stability between the currencies of the two countries.

On Aug. 15, Russia received $10,000,000 from the U.S. Stabilization fund against gold to be delivered within 90 days, and on Oct. 10, an additional $30,000,000 against gold to be delivered within 180 days. These were the first two instances in which the U.S. treasury purchased gold for future delivery.

Exchange controls in Europe and the British empire eliminated the need, so far as concerns these areas, for customary stabilization fund operations. There were no stabilization funds in operation in Europe (Jan. 1, 1942) and the stabilization funds of Great Britain and Canada were virtually inactive since the beginning of the war. The pre-war resources of the British Stabilization fund were virtually exhausted during the first two years of hostilities; gold held in the fund fell from $2,038,000,000 on Sept. 1, 1939, to $151,000,000 on Sept. 1, 1941. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES; GOLD.) (T. M. K.)

Exhibitions and Fairs: *see* FAIRS, EXHIBITIONS, EXPOSITIONS.

Expenditure, Government: *see* BUDGETS, NATIONAL.

Exploration and Discovery.

Arctic.—Although the usual program of northern exploration, both private and government-sponsored, was upset by the war, this did not mean that the Arctic lay disregarded, awaiting the coming of peace for a resumption of activities.

In fact, never before had so many people in so many countries been conscious of the importance of the Arctic in the world scheme.

Greenland.—Commercial relations between Greenland and the United States, which had been established during 1940 by the sending of a Greenland trade commission to the U.S. and the maintenance in Greenland of a United States consulate, were continued during 1941.

On April 10 it was announced from Washington that the Danish minister, Henrik de Kauffmann, had placed Greenland under the protection of the United States, giving the U.S. the right to establish air bases and other naval and military facilities on this strategic island. This action was taken by the minister "on behalf of the king of Denmark," who, it was assumed, could not exercise his sovereign powers so long as Denmark remained under German occupation.

The pact was to remain in force for 12 months after "it is agreed that the present dangers to the peace and security of the American continent have passed."

Military considerations necessitated secrecy with regard to what steps the United States had taken for the protection of Greenland, what bases might have been established there and the extent of reconnaissance work done. But that these activities extended to the east coast as well as the west was known from an announcement in the newspapers on Oct. 12 that a U.S. naval vessel had intercepted and brought to Boston a German-controlled Norwegian sealing ship which had established and was apparently attempting to provision a radio station somewhere on the east coast.

It was further stated that this station had been dismantled and its equipment and personnel carried away.

An expedition under the leadership of Louise A. Boyd, in the "Effie M. Morrissey," Captain Robert A. Bartlett commanding, made a summer trip to Greenland waters to study the rarefied layers that are from 50 to 300 miles above the earth. The findings will no doubt be of importance to long-distance radio transmission. Commander Donald B. Macmillan made his 19th expedition to west Greenland waters, this one announced as a summer trip sponsored by the New England Museum of Natural History for the purpose of making a collection of Arctic birds.

Spitsbergen.—Another scrap of news regarding northern wartime activity relates to the raiding of Spitsbergen by joint British and Canadian forces. It was announced, and further confirmed by widely published photographs, that radio stations had been dismantled and the valuable Spitsbergen coal mines, property of Norwegians and of the soviet government, rendered unfit for use. The 1,000 or more inhabitants of Spitsbergen, mostly Norwegian and soviet coal miners and their families, were removed.

U.S.S.R.—As a part of the program of scientific study of the polar basin, in connection with the operation of the northern sea route, a soviet expedition landed April 4 on floe ice near the Zone of Inaccessibility, the centre of which was defined by Stefansson in 1921 as being near 84° N., 160° W., the so-called Pole of Inaccessibility. The plane was piloted by I. I. Cherevichny, veteran polar flyer, and carried three scientists and a crew of six. They left Moscow on March 3 and flew in stages—passing over the northern sea route to Wrangel island, thence 650 mi. north of 81° N. Lat., 180° E. Long., where a floe base was established. Here, some 200 mi from the Pole of Inaccessibility, the party stayed for several days, studying ice, water and weather conditions. Extensive flights were made over surrounding areas.

The operation of the northern sea route, which had become well established, was, no doubt, continued as usual, but no figures were released on the number of ships that completed the passage nor of tonnage carried. The soviet government maintains in connection with this route a network of Arctic meteorological and scientific stations; planes scout overhead, observing ice conditions and indicating the most favourable routes for ships to follow; ice-breakers convoy the fleets of freighters, to force a pathway through ice that cannot be avoided.

Alaska.—On Oct. 25, 1940, the Japanese government notified the United States, Great Britain and the U.S.S.R. that she was abrogating the treaty regarding the fur seals of the Pribilof islands, effective one year later. The treaty had been signed by the four powers in 1911 when unrestricted slaughter of these valuable animals had reduced their estimated numbers to 123,600 and their extinction was feared. After a period of years during which no sealing was permitted, the treaty provided for United States control of the sealing operations, with vessels patrolling the waters surrounding the Pribilofs, and supervision of the killing, which was restricted to surplus three-year-old males. Under this policy the herds had by the last census increased to 2,185,000 animals. Legally Japan's abrogation took effect Oct. 25, 1941.

In June 1941, Amos Burg left Portland, Ore., in a 38-ft. sail boat with auxiliary engine for an extended study trip to Alaska. His itinerary included the 1,100-mi. inland passage, and extended well beyond this into Bering sea. Soundings were taken along the route. On Nunivak island he made a motion-picture film of Eskimo life; a second film was secured, dealing with Alaskan resources.

Canada.—In 1941 T. H. Manning returned from a five-year expedition to the eastern Canadian Arctic which included the mapping of Southampton island, at the entrance to Hudson bay. In the winter of 1940-41 Manning crossed Baffin island from Bowman bay on the southwest via Nettilling lake to Pangnirtung on Cumberland sound.

The Hudson's Bay company's ship "Nascopie" made its annual patrol of the eastern Arctic, taking supplies and change of personnel both to their own posts and to the various outposts maintained by the dominion. As usual, government officials accompanied the ship for scientific and inspection purposes.

Mr. and Mrs. A. L. Washburn flew from Edmonton in March 1940, to Cambridge bay, Victoria island, where they carried on geological work until the spring thaw. During the summer they flew to a number of places in and around Victoria island. In August they went by the trading schooner "Aklavik" to Terror bay, King William island, where they stayed until early in December. They then made their way back to Cambridge bay via the mainland; thence they travelled overland to Richardson island, off the south coast of Victoria island, where they were picked up in Feb. 1941, by a Canadian Airways plane which brought them back to the United States.

The American Geographical society expedition to the Yukon, under the leadership of Walter A. Wood, reported successful ascents of Mount Walsh and of Mount Wood, 15,880 ft., during the summer of 1941. Provisions for the mountain parties were dropped by parachute at selected bases. The expedition's work included also mapping flights and geological investigations.

Antarctic.—The work of the United States Antarctic Service expedition was concluded during 1941. During the Antarctic spring and summer of late 1940 numerous flights for exploratory and mapping purposes were made from both the west and east bases—west base, Bay of Whales, under command of Dr. Paul A. Siple; east base, near Neny island, Marguerite bay, commanded by Richard B. Black. Sledging operations, both for surveying and to establish supply depots, were carried out by parties from both bases; those from the west base included the setting up of aviation gasoline caches by means of an army tank and tractor. These and earlier operations resulted in the aerial mapping of the longest unknown coastline in the world, extending between the east and west bases, tied-in with ground observations of surveyors travelling by dog and motor sled. The expedition determined the insularity of Alexander the First Land, a region now shown as a pear-shaped island, 300 mi. long and 120 mi. wide.

The evacuation of the west base began when the "Bear" reached the Bay of Whales on Jan. 11, 1941, followed by the "North Star" on Jan. 24. After taking the west base party on board, the ships left the Bay of Whales on Feb. 1 and headed toward the east base on Palmer peninsula. Dense

pack ice prevented entry into Marguerite bay and the ships proceeded northward to Dallman bay, to await favourable ice reports from the east base. The unfavourable conditions persisted, as was revealed both by scouting flights from the base and by attempts to penetrate by ship. Finally the ships separated, the "North Star" with the east base party heading north for the Strait of Magellan, while the "Bear" continued attempts to reach the east base. Bad weather and difficult ice conditions still continuing, and winter approaching, an emergency evacuation by air was decided upon. The "Bear" proceeded to Mikkelsen island, small and snow-covered, about 112 mi. from the base. Here a suitable area for aircraft operations was located and a landing field prepared. The 26 men of the party, with their records and scientific specimens, were brought to Mikkelsen island on March 22 in two flights of the east base Condor plane. All equipment was left behind for the use of some future expedition; the plane itself was abandoned atop the plateau of the island. The "Bear" sailed at once for Magallanes, Chile, where it met the "North Star" on March 29; the "Star" reached Boston on May 5 and the "Bear" on May 18.

In addition to the extensive aerial and land survey, through which 1,000,000 sq.mi. of territory were said to have been charted, the work of the score of biologists, meteorologists and other scientists on the expedition staff was expected to yield valuable results. (*See* also AMERICAN GEOGRAPHICAL SOCIETY; NATIONAL GEOGRAPHIC SOCIETY.) (V. S.)

Explosive Rivets: *see* INDUSTRIAL RESEARCH; METALLURGY.

Export-Import Bank of Washington.

The Export-Import Bank of Washington, an agency of the United States, was established on Feb. 12, 1934, for the purpose of financing and facilitating trade relations between the United States, its territories, insular possessions and foreign countries. By an act of congress approved Sept. 26, 1940, the Export-Import bank was to continue as an agency of the United States until Jan. 22, 1947, or such earlier date as might be fixed by the president by executive order. By this act it was also granted specific authority to make loans which would assist in the development of the resources, in the stabilization of the economies, and in the orderly marketing of the products of the countries of the western hemisphere.

The bank in 1941 had lending authority of $700,000,000. Its capital consisted of $1,000,000 of common stock and $174,000,000 of preferred stock. All common stock, except 11 shares standing in the respective names of the trustees, was held jointly by the secretaries of state and commerce in their official capacities. All of the preferred stock was purchased by the Reconstruction Finance corporation. Its governing body was a board of 11 trustees representing the departments of state, treasury, commerce and agriculture and the Reconstruction Finance corporation.

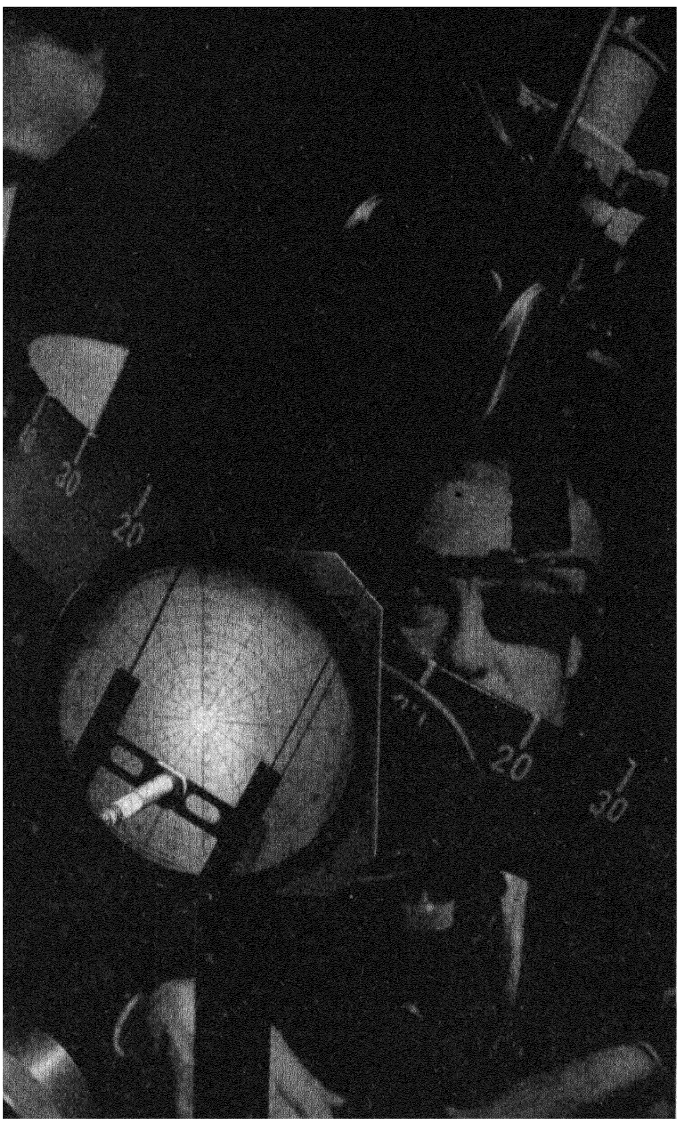
The bank had authorized since its creation $837,705,261 of loans to the end of 1941 as compared with $654,780,863 to the close of 1940. Actual disbursements in 1941 amounted to $116,835,507 against $95,298,476 in the previous year. Outstanding loans at the end of 1941 were $186,130,456 as compared with $131,031,867 at the end of the previous year. Net earnings during 1941 were $7,216,129, whereas in 1940 they amounted to $3,774,591.

During the year 1941 because of the international situation the Export-Import bank's new commitments were confined largely to Central and South America. The bank's facilities were used to finance the construction of highways, electrical plants, a steel mill in Brazil; to assist in the processing of wild rubber, the storage and sale of sugar, and many other projects, all contributing to the development of the resources of the respective countries involved and directed toward the encouragement of Central and South American countries to produce their requirements and the vital needs of the United States. (W. L. Pi.)

Exports: *see* AGRICULTURE; INTERNATIONAL TRADE.

Eye, Diseases of.

Cataracts.—One of the commonest causes of loss of vision is cataract or opacity of the crystalline lens of the eye. While many times the cause of cataract can be traced to some disturbance in the body such as diabetes, parathyroid gland disease, damage due to exogenous toxins, a cause cannot be found in most cases. In cases in which some metabolic disturbance is discovered, the mechanism of cataract formation remains obscure. It is an irreversible process, since remedy of the causative factor leads to little if any change in the already formed lens opacities. The only treatment of value in restoring visual loss due to cataract is the surgical removal of the opaque lens.



INSTRUMENT which measures a glaucoma victim's field of vision and thus determines the extent of damage to the retina. In 1941 about 120,000 U.S. citizens were totally or partially blind as a result of glaucoma

For many years ophthalmologists have known that the injection of concentrated solutions of some substances into experimental animals will oftentimes produce cataracts. From the departments of ophthalmology and chemistry of Northwestern university medical school has come the report of carefully controlled research on this phenomenon. Bellows and Chinn were able to produce cataracts in dogs and albino rats by the intravenous administration of hypertonic solutions of sodium chloride, sodium sulphate, lithium chloride, galactose, arabinose, xylose, glycerin, ethylene glycol, amino-acetic acid, sodium lactate and ethyl alcohol. The reaction appears to be due to the hypertonicity rather than to the chemical nature of the solution. Their studies indicated rather conclusively that these cataracts are due to a change from normal of the osmotic balance on the two sides of the capsule of the crystalline lens. They produced evidence that

many clinical forms of cataract are due to an osmotic imbalance coincident with either disease or age.

These studies, and others being carried on, did not offer any new form of treatment for cataracts. However, they were extremely valuable in that they are leading to a clearer understanding of the processes of cataract formation. This must precede any medical treatment of cataracts aimed at their prevention, arrest or improvement.

Vitamin C in the Treatment of Corneal Inflammation.—Two eye physicians of the R.A.F., T. K. Lyle and D. W. McLean reported a series of cases of varied types of corneal inflammation which responded very poorly to local treatment, but which showed dramatic improvement following intravenous injections of ascorbic acid (vitamin C).

Vitamin C is known to exist in high concentration in the human cornea. It belongs to a group of substances known as redox potentials. These act as either oxidizing or reducing agents. Either oxidation or reduction, whichever is called for, might be speeded by the presence of an excess of ascorbic acid in a tissue. Hence, corneal metabolism might be accelerated to the benefit of corneal inflammation by an excess of it in the cornea. Acting on this theory, Lyle and McLean used ascorbic acid intravenously in treating keratitis with marked success. Thus a new treatment which appeared promising was added to the present therapy of corneal inflammation.

Vitallium Implants.—When the ophthalmologist finds it necessary to remove an eyeball, he must think of the future appearance of the artificial eye. To prevent unnatural folds, depression and drooping of the lids and sinking of the artificial eye, and to obtain the maximum motility of the artificial eye, most ophthalmologists feel that something should be implanted in the socket to fill out the space formerly occupied by the eyeball. Gold and glass ball implants have been most widely used, but both have disadvantages. Pure gold is too soft for a satisfactory implant. Gold alloys contain less than half gold and are subject to chemical decomposition. Glass may shatter from erosion or possibly from injury.

A wholly satisfactory substance for implants seems to have been found in vitallium. It is an alloy of cobalt, chromium and molybdenum. It is stronger, lighter and cheaper than gold. It is chemically inert and causes no tissue reaction.

Treatment of Retinitis Pigmentosa.—Retinitis pigmentosa is a chronic progressively degenerative disease of the retina of the eye characterized by night blindness, contraction of the visual fields and dimness of vision. It is often found in several members of a family. An effective treatment for the condition has not been available.

A report in 1941 told of a series of six cases of typical retinitis pigmentosa which were treated with injections behind the eyeball of 0.1% atropine sulphate solution. The patients were followed for a period of two years. Two of the patients showed definite improvement. The condition was apparently arrested in one case. The remaining three did not seem to benefit.

In a condition such as retinitis pigmentosa, these results may be considered as quite satisfactory. The results appear to be caused by an increase in blood supply to the retina caused by the retrobulbar injections.

Pilot Fitness.—Major General James E. Fechet (retired), formerly chief of the U.S. army air corps, said in discussing the causes of aeroplane crashes that in over half the cases these are due to personnel error or to undetermined causes. In the personnel group he included the pilot, the weatherman, the air-line operations manager and the mechanic. The pilot's eyesight is of obvious importance.

An instrument called the tachistoscope, which had its origin during World War I, was improved and brought into use again because of the demand for sensitive tests of visual function in pilots. It measures the speed of adjustment of the eyes for change of distance, the speed of accommodation, the speed of adaptation for differences of illumination and the rapidity of ocular fatigue. (*See* also VITAMINS.)

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Fadden, Arthur William (1895–), Australian politician, was born April 13 in Ingham, Queensland, Australia. A Queensland accountant, Fadden won a seat in the Australian house of representatives in 1936. He was acting prime minister while Robert Gordon Menzies was representing Australia at London conferences in 1941. Growing Australian dissatisfaction with Britain's conduct of the war led to the downfall of the Menzies government, and Fadden became prime minister on Aug. 28, 1941. At the same time he was unanimously elected leader of both the Country party (his own party) and the United Australian party. But foes of the Menzies regime contended that the new Fadden government was merely a continuation of the Menzies government, and on Oct. 3, 1941, Fadden's cabinet fell after a tenure of only 37 days.

Fair Labor Standards Act: *see* CHILD LABOUR: *United States.*

Fairs, Exhibitions, Expositions. In 1941, due to world conditions, no major fairs were held. Several had been projected but were abandoned. The two great fairs of 1940 were the New York world's fair, in New York, and the Golden Gate exposition at San Francisco, Calif. Demolition of these two gigantic projects was completed in 1941. In New York, the site of the world's fair was rapidly being developed into a 1,200-acre public park. In San Francisco, the site of the Golden Gate exposition was being developed into an aeroplane field.

It has been the history of major expositions to take and develop wastelands, swamps, etc., as sites, using the planning and building of the exhibitions in reclaiming such wastelands, which become public parks, such as the San Diego exposition of 1915–1916, developed into Balboa park; Chicago world's fair of 1933–34, developed into Burnham park, and the Columbian exposition of 1893, developed into Jackson park, in Chicago, Ill. (L. SK.)

Falk Foundation, The Maurice and Laura, of Pittsburgh, Pa., under its policy of devoting its resources to financing research studies of the factors affecting American industry, trade and finance, turned its attention in 1941 chiefly to economic problems arising out of the defense program. Under the foundation's grants, the Brookings institution, Washington, D.C., published in January a short study entitled *Fundamental Economic Issues in National Defense* and then projected its research on problems of the economics of defense into a series of pamphlets, of which the following two were published: *Effects of the Defense Program on Prices, Wages, and Profits* and *Curtailment of Non-defense Expenditures.* In order to stimulate widespread interest in the findings of these studies, the Falk foundation purchased and distributed, without charge, approximately 350,000 copies. Another pamphlet disseminated widely by the foundation was *America's Factories*, published by the Public Affairs committee as a summary of *The Output of Manufacturing Industries, 1899–1937*, a study by the National Bureau of Economic Research under a Falk foundation grant.

Other activities of the foundation during 1941 included appropriations of $60,000 to the Brookings institution for its general support over a two-year period and $10,000 to the Carnegie Institute of Technology, Pittsburgh, for the annual support of the Maurice Falk Professorship of Social Relations, pending payment of the foundation's $300,000 endowment-grant for the professorship. (J. S. G.)

Falkland Islands: *see* BRITISH EMPIRE.
Farm Credit: *see* AGRICULTURE.
Farm Credit Administration: *see* FARM MORTGAGES; FEDERAL LAND BANKS.

Farmers' Co-operatives. The number of farmers' co-operative marketing and purchasing associations in the United States was 10,700 in 1940, to which 193 new associations were added up to the end of the fiscal year, June 30, 1941, the U.S. Farm Credit administration reported in its annual review of farm co-operative activities. The number of farmers' co-operatives has remained almost constant since 1936, the administration reported, and included a membership of 3,000,000 farmers whose associations did a combined business of slightly more than $2,000,000,000 annually. Purchasing co-operatives are the largest in number, 2,649 associations. Grain

marketing co-operatives numbered 2,462. Other marketing associations included dairy co-operatives, 2,395; fruit, vegetable and nut associations, 1,139; livestock, wool and mohair associations, 978; cotton, 536; poultry and eggs, 181. Farm co-operative or mutual fire insurance companies had $12,500,000,000 fire insurance in force, the review asserted, and 63 specialized windstorm mutuals had about $4,000,000,000 of insurance in force. The annual review pointed out a tendency to merge local dairy co-operatives. The co-operative research service division of the Farm Credit administration, which carries on studies of co-operative problems, reported on merchandise trends which affect farm co-operatives, especially co-operative canneries. These, the report points out, are adapting themselves to merchandising changes, which include a trend toward a greater use of dealer brands on canned goods, rather than the brand of the packer; the great increase in the consumption of tomato and fruit juices, the expanding business in frozen foods and the effect of the large city supermarkets. See June 1941 number of *News for Co-operatives*, monthly publication of the Farm Credit administration, for annual review of farm co-operatives in the United States.

(S. O. R.)

Farm Income. United States farmers received in cash from the marketing of products and from government payments in 1941 the largest income since 1929; it was estimated by the department of agriculture as $11,200,000,000, compared to $9,100,000,000 in 1940. The 1941 total was about $100,000,000 less than the 1929 income, but almost $400,000,000 above the average annual income of the period 1924–29. In Dec. 1941, the department of agriculture forecast the cash farm income of 1942 as $13,000,000,000. The increased income would come, it was reported, from expanded industrial activity and from the lend-lease program of greater exports of "food for freedom." From March 15, 1941, when the agricultural department's expanded lend-lease buying program began, to Dec. 1, this governmental wartime outlet for farm products contributed more than $500,000,000 to the 1941 farm income. Although such supplies were predominantly for export to Britain, a part was available for Red Cross and other relief purposes.

U.S. Lend-Lease Purchases of Food, March 15 to Dec. 1, 1941

Commodity	Quantity	F.O.B. cost
Meat products		
Lard	308,665,756 lb.	$31,831,664
Pork meat products, canned	209,202,592 lb.	67,684,022
Pork meat products, cured and frozen	231,532,881 lb.	42,825,115
Pork meat products, casings	1,625,219 bundles	1,779,077
Dried beef	11,000 lb.	4,235
Beef bungs	247,900 pieces	32,966
Chicken, canned	3,331,064 lb.	3,849,917
Dairy products (*see* CHEESE; MILK)		
Poultry products		
Eggs, dried	35,332,155 lb.	40,311,574
Eggs, frozen	66,180,370 lb.	16,045,442
Eggs, shell	1,492,783 cases	11,615,703
Vegetables (*see* TRUCK FARMING)		
Fruit		
Grapefruit, for juice	3,743 tons	96,020
Grapefruit, canned segments	398,418 cases	705,021
Grapefruit juice, canned	643,200 cases	858,454
Orange juice, canned	8,000 cases	17,720
Orange juice, concentrated	198,002 gal.	644,070
Lemon juice, concentrated	30,000 gal.	70,850
Apricots, canned	262,049 cases	809,038
Peaches, canned	572,453 cases	1,942,865
Pears, canned	1,004,890 cases	3,866,361
Prunes, canned	751,569 cases	1,635,163
Pineapple, canned	5,000 cases	17,500
Apples, canned	350,100 cases	876,237
Prunes, dried, natural condition	92,133 tons	5,549,329
Prunes, dried, processed	42,589 tons	4,100,329
Raisins, natural condition	38,476 tons	2,690,128
Raisins, processed	15,000 tons	1,121,775
Apples, dried	9,230,275 lb.	932,197
Apricots, dried, natural condition	1,127,066 lb.	127,367
Apricots, dried, processed	16,347,250 lb.	1,986,629
Peaches, dried, natural condition	191,200 lb.	15,296
Peaches, dried, processed	10,654,525 lb.	1,147,356
Apple pomace, dried	1,723,369 lb.	36,532
Pears, dried, natural condition	4,124,000 lb.	371,160
Pears, dried, processed	3,218,125 lb.	$ 245,365
Mixed dried fruit	80,000 lb.	4,270
Apples, fresh	6,336,835 bu.	6,464,402
Grapefruit, fresh	7,036 tons	125,150
Oranges	503,580 boxes	503,580
Prunes, fresh	2,265 tons	56,636
Strawberries, fresh, uncapped	130,615 lb.	11,199
Plums, fresh	47,237 boxes	35,428
Peaches, fresh	1,285,948 bu.	1,211,888
Grain and grain products		
Biscuits (hardbread)	3,675,750 lb.	370,388
Cornstarch	169,320,000 lb.	5,115,718
Flour, white, enriched	690,685 barrels	3,388,121
Flour, graham	150,050 barrels	610,596
Rice	3,200,000 lb.	131,200
Wheat, cracked	22,000,000 lb.	447,151
Corn grits	75,000 barrels	275,349
Oats cereal	95,210,160 lb.	3,401,797
Wheat meal	500,000 lb.	12,250
Macaroni	70,000 lb.	4,669
Fish		
Canned fish (spots)	1,778,039 cases	13,495,627
Canned fish (futures)	2,573,450 cases	8,500,777
Miscellaneous foods		
Pork and beans, canned	2,401,208 cases	4,922,805
Canned ration	3,449,976 lb.	582,680
Cocoa	375,000 lb.	59,359
Oleo oil	1,786,250 lb.	199,786
Soup, dehydrated	4,750,000 lb.	665,876
Cane syrup	10,000 cases	32,233
Corn sugar	9,370,000 lb.	410,461
Peanut butter	1,762,000 lb.	193,495
Peanuts, shelled	6,011,200 lb.	403,344
Peanuts, unshelled	610,286 lb.	113,874
Walnuts, shelled	1,500,000 lb.	532,500
Soy flour	15,490,000 lb.	880,980
Oleomargarine	1,120,000 lb.	153,286
Honey	2,264,320 lb.	118,094
Pectin	1,599,000 lb.	1,121,514
Orange marmalade pulp	218,400 lb.	16,026
Popcorn	112,000 lb.	7,260
Soybeans	21,230,000 lb.	636,794
Nonfoodstuffs		
Cotton, raw, baled	113,648 bales	5,698,120
Cotton linters	15,575,000 lb.	758,629
Comforter covering	7,000,000 yd.	759,400
Cotton ticking	8,370,000 yd.	1,133,742
Garden seeds	279,000 lb.	50,701
Grass and clover seeds	9,085,113 lb.	1,303,883
Vegetable seeds	920,050 bags	840,690
Cotton, baled*	470,000 bales	38,154,850
Corn*	11,145,000 bu.	10,116,658
Tobacco*	149,828 tierces	41,954,200
Wheat*	373,333 bu.	354,667
Nonagricultural products		
Vitamin A, fish-liver oil	106,942 lb.	435,615
Provitamin A, carotene in oil solution	2,205 lb.	15,000
Vitamin B1—thiamin hydrochloride	8,741,239 lb.	2,577,250
Vitamin C, ascorbic acid	5,000 lb.	148,000
Diacetone, gulsonic acid	2,975 kg.	29,750
Cyanacetamide	4,000 kg.	21,200
Wood rosin	22,960,710 lb.	540,092
Tarene	225,000 gal.	62,438
Tarol	60,000 gal.	24,000

*Made available by the Commodity Credit corporation for lend-lease operations in addition to the above purchases.

(S.O.R.)

Farm Machinery. On the 6,091,000 farms in the United States there are 25 tractors, 15 trucks and 60 automobiles to every 90 farms, according to figures for 1941, published by the department of agriculture. The number of trucks and automobiles on farms has increased but slightly since 1931, but the number of tractors has almost doubled since that time. In 1930 there were 778,430 tractors on the farms in 39 states. Ten years later, the 1940 census, as reported in 1941, showed 1,313,799 tractors on the farms of those states. During that time the number of farms declined at an unusually rapid rate, owing to droughts and the depression which started in 1929; there were 6,812,000 farms in the United States in 1930.

Production of farm machinery in 1941 increased substantially over that of 1940 chiefly because of two factors, increased farm income resulting from increased industrial activity growing out of the national defense program and decreasing supply of farm labour, a result of the enlargement of the army and the larger employment opportunities in industry. Production of farm equipment in 1940 was $488,000,000. The increase over that figure in 1941 was estimated by various authorities as from 15% to 25%. Preliminary estimates by Louis J. Paradiso and John H. Morse of the U.S. department of commerce placed the production of farm equipment in the United States in 1941 at $560,000,-

000, an increase of 16% over that of 1940. An extensive analysis supporting this estimate appears under the names of Paradiso and Morse in the *Farm Implement News*, Chicago, July 24, 1941. Other authorities consider this estimate too low, owing to the fact that farm purchasing power now has a considerable addition from what is termed "off-the-farm income," meaning income that farm owners receive from sources not connected with the farm, such as urban employment of members of farm families and investments by farmers. The volume of this additional farm income is not known exactly, but it is estimated to run close to $2,000,000,000 a year under prevailing economic conditions.

Prices of farm implements advanced only slightly in 1941. While a number of the farm implement manufacturers engaged in the production of war materials under government contracts, the volume was not sufficient to interfere with increased production of farm machinery, which was considered essential to increased production of food and national defense. The industry evidenced considerable concern over the future possibility of material supplies being curtailed by defense needs, particularly of such items as contained rubber. Farm tractors are now almost entirely rubber-tired. A new angle in the utilization of power machinery on farms, and comparable to the safety situation in industry, appeared in June 1941, when the Illinois legislature authorized the state departments of commerce and labour to investigate the causes of accidents in the operation of tractors. (S. O. R.)

Farm Mortgages. The outstanding farm mortgage debt in the United States declined further in 1941, in line with a general trend that has prevailed in most years since an all-time high of $10,800,000,000 in farm mortgages in 1923. At the close of the fiscal year ending June 30, 1941, the 12 federal land banks reported $1,817,937,635 in unpaid principal of outstanding farm mortgages. This was $62,470,370 less than the amount on June 30, 1940. Of the total outstanding June 30, 1941, delinquencies amounted to $282,774,006. In addition, the land banks held $46,103,387 of purchase-money first mortgages, $2,850,493 of purchase-money second mortgages and $59,370,376 of real estate sales contracts and notes. On June 30, 1941, the Federal Farm Mortgage corporation held $230,540,344 in first farm mortgage loans, $399,578,173 in second farm mortgages, $3,369,270 in purchase-money first mortgages, $1,400,970 in purchase-money second mortgages and $10,835,299 in real estate sales contracts and notes.

The 12 federal land banks and the Federal Farm Mortgage corporation together held approximately 40% of the U.S. farm mortgages in 1941, the department of agriculture estimated. The life

Foreclosures of U.S. Federal Lending Agencies
(For fiscal year ending June 30, 1941)

Year	Number of properties acquired	Number of properties sold	Number of properties held
1941	5,515	9,872	18,799
1940	7,871	10,924	23,136
1939	11,188	9,742	26,161
1938	7,756	13,011	23,801
1937	12,330	16,321	28,203
1936	14,948	11,891	30,257

insurance companies, which at one time had more than $2,000,000,000 invested in farm mortgages, had less than $900,000,000 in 1941. Agricultural department authorities, commenting on farm mortgage trends (Sept. 1941) reported that one large life insurance company had endeavoured to increase its farm mortgage investments, but that payment on old loans more than offset the new loans made. The governmental lending agencies reported that foreclosures declined in the calendar year 1941, cash collections increased and many farmers paid out in full prior to maturity. Particularly notable was an increase in sales of government-held (foreclosed) farms in Nebraska and South Dakota and other parts of the great plains area where dust storms and droughts in 1934 and 1936 had resulted in widespread abandonment of farms. (*See* also FEDERAL LAND BANKS.) (S. O. R.)

Farm Security Administration: *see* AGRICULTURE; HOUSING.

Farm Tenancy. The wartime demand for practically unlimited farm production may have the effect of reducing farm tenancy in the United States by providing, with government aid, further means for tenants to become farm owners. The Farm Security administration prepared a program in 1941 to add to defense production by assisting the 600,000 low-income farm families who operate farms with rehabilitation and tenant purchase funds. About 39% of the 6,096,799 U.S. farms in 1940 were operated by tenants. In 1930 the number of farms was 6,288,648, 42% of which were operated by tenants. Government aid in buying farms reduced the number of tenant farmers, but much of the decrease in the decade 1930–40, according to the department of agriculture, was "a change in the status of many sharecroppers in the south to 'wage hands,' 'resident labourers' or regular farm labourers." In 1880 only about 26% of United States farms were operated by tenants. The combined acreage of all farms in the United States in 1940 was 1,060,852,374 ac. and the average size farm was 174 ac. In 1930 the combined acreage of all farms was 986,771,016 ac., and the average size farm was 157 ac. After the start of the national defense program in 1940, some 14,000 farm families were removed from farms in areas purchased by the United States government for proving grounds, manoeuvre areas, bombing fields and other military sites. Several thousand more were to be removed in 1942. (*See* also FARM MORTGAGES.) (S. O. R.)

Fascism. Fascist propaganda worked among the democracies in three ways: It tried to divert attention from the fascist pattern of conquest by raising irrelevant issues and by sowing dissension and distrust among the democratic nations, both within these nations and between the nations; naturally propaganda against "Russian bolshevism" or against "British imperialism" was promoted by all means in the United States, while in Latin America it was propaganda against "Yankee imperialism"; it tried to belittle democracy, or to make the citizens believe that they do not live in a real democracy, but under a dictatorship; this doubt about democracy was raised equally from the rightist as well as from the leftist point of view, depending upon the audiences for which it was destined, all the while forgetting that according to fascist theory democracy was something intrinsically corrupt and decadent and dictatorship something good; the third way, and perhaps the most characteristic one, was supplied by anti-Semitism, by blaming the Jews for the war, as if fascist theory would not praise war as something fundamentally noble and desirable, and branding every resistance to fascism as "Jewish war-mongering." Anti-Semitism at the same time served the purposes of undermining the faith in democracy and the faith in the Judeo-Christian tradition of moral law.

Toward the end of 1941 the violent attacks of fascism were directed more against the United States than against the soviet union or Great Britain. The *Stampa* of Turin, one of Italy's best-known papers, wrote on Oct. 23 of Secretary Hull and President Roosevelt as "throbbing with rage as they use phrases from the ghetto from which the latter has descended."

(*See* also ANTI-SEMITISM; COMMUNISM; DEMOCRACY; GERMANY; ITALY; JAPAN; MINORITIES; PACIFISM; RUMANIA;

SPAIN.)

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Fashion and Dress. In 1941 fashions were restrained, practical, inconspicuous. In the warring countries clothing rations were in force—hence fewer clothes were made. In the United States, American designers continued to create—simple, wearable fashions in keeping with the tragic times.

In spring 1941, as a reaction, colour swept the fashion scene. Bright woollens, the brighter the better, were in fashion. Acid greens, South American pinks, reds, pale blues vied with the traditional navy blues. Blouses contrasted with skirts, and skirts were not always the same shade as the jackets. Gaudy woollen snoods competed with hats, and many of these snoods were flecked with paillettes. The suit jackets were often cut with peplums, the skirts were invariably straight and short. The shirtwaist and skirt idea "caught on" and young girls were wearing striped wool jersey middy-blouse tops pulled down over dark pleated skirts.

Summer brought in new play fashions: frontier pants, slim and tapering, instead of flapping slacks; sleeveless waistcoats to wear with slacks and sports skirts; a wave of black and white for the beach or for spectator sports—white sharkskin playsuits with black linen aprons, all black slack suits, black shorts worn with white shirts. College girls began doing their hair in pigtails. Fishermen's espadrilles with tapes crisscrossed up the leg became a rage. The bright printed calico skirts of the southwestern Indians were worn tremendously, short for day, long for evening—the shops called them "broomstick skirts."

In midsummer, when the United States announced an embargo on Japanese silk, a panic hit the hosiery counters in department stores throughout the country. Police were called in to control the crowds of women who rushed in to stock up with precious silk stockings. Manufacturers speeded up the production of nylon hosiery. To wean women away from silk, coloured cotton stockings were launched, and the department of agriculture in Washington, D.C., set to work in its research laboratories to develop cotton meshes, sheer and lacy. Meanwhile the cosmetic industry was experimenting with make-up for the leg, to create the effect of stockings in case the shortage became acute.

The autumn collections produced one startling change in silhouette—the shorter evening dress—which cleared the floor by six or eight or even ten inches, showing the ankle, and throwing a new spotlight on the foot and shoe. These short evening dresses went like wildfire—black satin skirts with black lace blouses, black starched mousseline dresses with ruffled jabots, glazed chintz dirndls for evenings in the south, white lace, pink satin—the variety was infinite. With these short skirts came ballet slippers with ribbons bound round the legs and platform slippers with straps around the ankle to give shorter women height. Old-fashioned rhinestone shoe buckles were revived on simple, low-cut evening pumps.

The autumn fashions twinkled with jet—jet beads and jet bugles were embroidered on suit pockets and lapels, dripped from blouses and evening caps, sparkled throughout all the evening fashions. With jet came multicoloured paillettes as big as dimes and these were sewn on velvet sailor hats, on veils, on scarves and gloves and lace snoods.

Blond furs made their appearance amidst the traditional minks and sables and nutrias, and most particularly Himalayan marten, honey beige in colour, elegant and dressy and luxurious. Fur-lined coats were another extravagant luxury—raspberry red wool lined with Persian lamb, bright lacquer red wool lined with beaver. Oct. 1941 launched a new evening fashion—comfortable warm cashmere sweaters embroidered with pearls and gold or with dead black jet, a necklace effect at the neck, a bracelet of embroidery on one cuff.

World War II.—Meanwhile American women were rapidly getting into the uniforms of the various Red Cross units, the voluntary services and civic defense corps. These uniforms varied in style and in colour, but their tailored simplicity set its mark on all fashion. Practical walking shoes appeared on the streets. The girls who had been wearing their hair in long manes that swept over one eye in imitation of the movie star Veronica Lake began to cut their hair shorter. In the colleges, short curls all over the head became a fad.

When the United States entered World War II the women who were not in active service prepared to see the war out in simple suits made in cheerful colours, in long simple dinner dresses with sleeves or jackets, or the shorter ballet-length evening dresses. (*See* also FURS.) (C. SN.)

FBI: *see* FEDERAL BUREAU OF INVESTIGATION.
FCC: *see* FEDERAL COMMUNICATIONS COMMISSION.
FDIC: *see* FEDERAL DEPOSIT INSURANCE CORPORATION.

Feder, Gottfried (1883–1941), German politician and one of the founders of the nazi party, was born Jan. 27 in Wuerzburg, Germany. In 1919, Feder invited Adolf Hitler to join a political band of 60 men called the German Workers' party, whose avowed goal was to deliver the reich from "grasping Jewish economy" and return it to "creative Aryan capital." In 1922 Feder drew up the original 25-point program upon which the nazi party, successor to the German Workers' party, was founded. From that point on, Hitler took control of the party and upon becoming reichschancellor in 1933, he appointed Feder state secretary in the reich ministry of economics. But Feder's extremist economic theories led to his downfall. In 1934, when the reich was using six kinds of depreciated marks, Feder insisted that Germany was wedded to the gold standard and the stable mark. In Dec. 1934 Feder was placed on the retired list and faded into obscurity as a political figure. He died in Munich, Sept. 24.

Federal Bureau of Investigation. The federal bureau of investigation was founded in 1908 to provide the United States department of justice with a permanent investigative force. In 1924, John Edgar Hoover was appointed director. Although it has been known as the bureau of investigation and later as the division of investigation, its present name, the federal bureau of investigation, is more descriptive of its status as the general investigative agency for the federal government.

The FBI is charged with the duty of investigating violations of the laws of the United States, collecting evidence in cases in which the United States is or may be a party in interest, and performing other duties imposed upon it by law. By presidential directive, the FBI has jurisdiction over espionage, sabotage, neutrality violations and related national defense matters.

During the fiscal year 1941 the investigative activity of the FBI resulted in 6,182 convictions, more than in any former fiscal period. Of these, 412 convictions were secured under the national defense classifications, as compared with 58 such convictions during the year 1940. Since the passage of the Federal Kidnap-

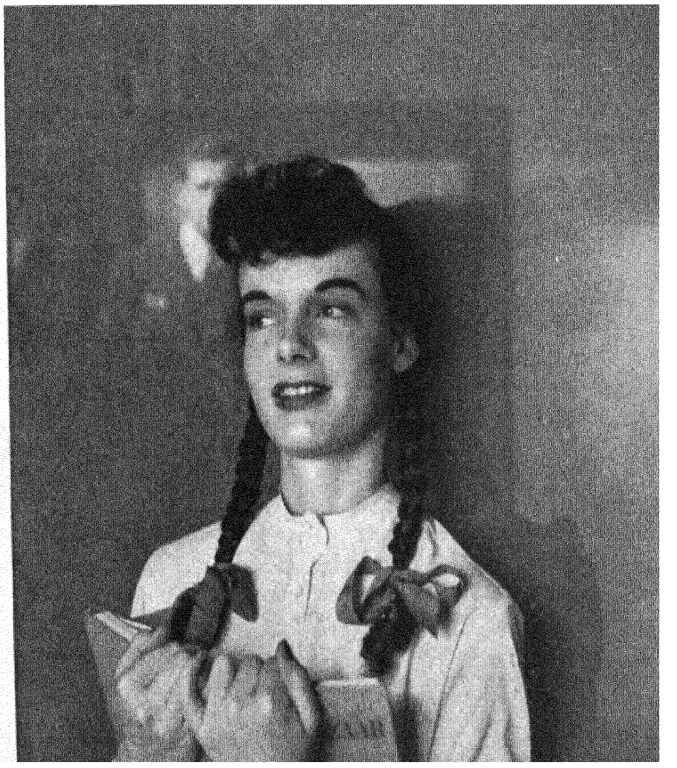
COMPLETE SNOODS, flat in back and wide at the sides, were popular in the fall of 1941

JET BEADS OR PAILLETTES twinkled on many dresses in the autumn of 1941, as on this short dinner dress for restaurants or theatres

Above: PEPLUMS of bullet padding were featured in the spring of 1941

Left: PLATFORM-SOLE SHOES with mesh ties, designed for street use in 1941 by Fritz Henle

Below: A FAD AMONG COLLEGE GIRLS in 1941 was a coiffure of pigtails adorned with bows, ribbons or flowers



ping statute in 1932, 204 of the 206 kidnapping cases reported to the FBI had been solved as of Sept. 15, 1941. Bank robbery, which is investigated by the FBI, declined more than 83% since its peak year in 1932. In the fiscal year 1941, convictions were obtained by the FBI in 96% of the cases investigated and brought to trial.

National Defense.—In response to the tremendous increase of its duties because of the national defense program, the FBI doubled its personnel in 1941. A total of 68,368 national defense matters requiring investigative activity were received during the fiscal year 1941. At the request of the army and navy, a program of surveying the protective facilities of industrial plants having contracts to supply the armed forces was instituted in 1939. During the fiscal year 1941, 1,359 plants were surveyed and officials of such plants received from the FBI recommendations designed to afford a maximum of protection against espionage and sabotage. There has been a negligible amount of espionage during the world crisis as compared with the similar period of World War I, and there has been no indication of any organized sabotage in the U.S.A. Through the FBI law enforcement officers mobilization plan for national defense, the activities of federal and local law enforcement agencies have been thoroughly co-ordinated to handle espionage, sabotage and other matters pertaining to the internal security of the U.S.A.

Finger-print Records.—With a nucleus of 810,000 finger-print records, the identification division of the FBI was founded in 1924. In 1941 there were more than 23,000,000 finger-print cards on file. Not all of these prints were those of criminals. The FBI maintains a civil identification section to insure the personal identification of citizens by finger-prints in case of an emergency where identification by other means would be impossible.

More than 14,500 scientific examinations were conducted in the technical laboratory of the FBI during the fiscal year 1941, and many of these examinations were conducted for municipal, county and state law enforcement agencies without charge. (*See* also CRIME; KIDNAPPING; MUNICIPAL GOVERNMENT; POLICE; SECRET SERVICE.) (J. E. H.)

Federal Communications Commission.

The Federal Communications commission was engaged in 1941 in a number of important national defense duties. Besides maintaining surveillance of radio transmissions emanating in the U.S.A., the commission listened in and analyzed broadcasts of foreign origin. The latter task was performed by an adjunct, the foreign broadcast monitoring service, established in 1941. Overseas broadcasts were watched continuously for intelligence and trends. Between 600,000 and 900,000 words were recorded daily. About 75% was in languages other than English.

Meanwhile the national defense operations section of the commission, created in 1940, policed the domestic ether lanes through the medium of nearly 100 field stations of one type or another scattered strategically throughout the United States and its possessions.

Of significance in the broadcast field was the advent of two new services, authorized by the commission on a full-fledged commercial basis. These are frequency modulation, popularly known as "FM," and television. By being on the high frequencies, each offers distinctive features in developing additional broadcast facilities. On March 29, 1941, an orderly shift of domestic standard broadcast frequency assignments was accomplished under the North American Regional Broadcasting agreement. This is a pact between Canada, Cuba, the Dominican Republic, Haiti, Mexico and the United States to eliminate or minimize mutual interference problems.

During 1941 the commission issued regulations to foster competition in network operation. They were subsequently suspended pending court action on requests by two networks for a preliminary injunction. The commission held extended hearings on its investigation to determine what policy or rules, if any, should be promulgated with respect to newspaper applicants to operate FM and new standard broadcast facilities. Hearing was also held on a proposed rule to ban multiple operation of standard broadcast stations in the same area.

The commission effected a reduction in long-distance interstate telephone rates, starting July 10, 1941, which was estimated to save the public $14,000,000 a year. In October the senate interstate commerce committee recommended a merger of both domestic and international United States telegraph carriers which had been proposed by the commission in 1940–41 on the basis of economic and defense considerations. (*See* also DEFENSE COMMUNICATIONS BOARD.)

Federal Council of the Churches of Christ in America.

In 1941 two additional Protestant denominations became official members of the council: The Presbyterian Church in the U.S. (South) by action of its general assembly in May, and the Church of the Brethren by action of its general conference in June. The member denominations of the council include most of the major Protestant bodies and one church (Syrian Orthodox) of the Eastern Catholic group. The total constituency of the council in 1941 was 140,000 local congregations with a combined membership of 25,064,082.

The program of the year was marked by a strong emphasis on the new tasks created by the war. The commission on army and navy chaplains opened an enlarged office in Washington, D.C. The commission on camp and defense communities was created, with the collaboration of the Home Missions council, to assist the churches facing enlarged responsibilities because of their proximity to camps or new wartime industries. A committee on conscientious objectors represented the interest of the co-operating churches in the men rendering their "work of national importance" in civilian camps. A committee on foreign relief appeals, with the collaboration of the Foreign Missions conference, coordinated the efforts in behalf of refugees, prisoners of war, the suffering in China, children in unoccupied France, missionaries cut off from their normal bases of support, and church groups undergoing unusual privation in Europe. A commission on aliens, with special reference to interned aliens in the U.S., was established after the United States entered the war. A commission to study the bases of a just and durable peace was appointed.

The council continued the National Christian mission in a dozen centres of population. Interdenominational conferences on family life, on religion and health, on Christian social work, on inter-racial co-operation and on public worship were held in the different regions of the United States. Ten religious programs over national radio networks were presented each week throughout the year. *Information Service* was published weekly as an analysis of social, international and inter-racial problems of special interest to the churches. (S. McC. C.)

Federal Crop Insurance Corporation: *see* CROP INSURANCE.

Federal Deposit Insurance Corporation.

During 1941, financial aspects of the program for arming the United States and its allies occupied the attention and the re-

sources of insured banks. Bank loans and investments rose by about $6,500,000,000 during the year as banks co-operated in meeting the greatly expanded financing requirements of industry and the government. Insured institutions also gave active support to campaigns of the United States treasury designed to promote the sale of defense bonds and stamps and to encourage savings by their customers in anticipation of the materially increased income tax requirements of 1942.

Immediate effects of the expanded industrial activity of 1941 upon U.S. banks were two. First, the banks—already in a position with respect to soundness and liquidity to undertake the new financing without strain—found their prospects enhanced by increased earnings. Second, many banks whose asset positions had been precarious were strengthened by recoveries in commodity prices and real estate prices. As a result of these influences, only eight insured banks failed during 1941, the lowest number for any year since inception of federal deposit insurance on Jan. 1, 1934.

An expansion of bank loans and investments means the assumption of additional risks. The corporation continually urged, therefore, that insured banks set aside a sizeable portion of their increased earnings to augment bank capital, which through 1941 had not grown at a rate commensurate with the growth of bank assets. It also urged consistently that insured banks carry their assets at proper values, writing off known losses and depreciation as they materialize. These steps are essential if the banks are to be able safely to make the readjustment to postwar conditions.

By the end of 1941, capital and surplus of Federal Deposit Insurance corporation had grown to more than $550,000,000. The corporation's income reached the rate of $55,000,000 a year. Under conditions of 1941, a large part of this income could be added to surplus annually. Given the co-operation of bank management and effective bank supervision, these resources should help to cushion the shock of postwar adjustment.

From the beginning of deposit insurance through Dec. 31, 1941, there were 370 insured banks closed or merged with the aid of loans from the FDIC. These banks held deposits of $470,000,000, of which $458,000,000, or 97%, were made available promptly without loss to depositors. Of the 1,215,000 depositors in these banks, only 1,948, or less than one-quarter of 1%, held accounts in excess of $5,000 and were not fully protected. These 370 cases involved outlays by the corporation totalling $242,000,000, of which it is expected 80% ultimately will be recovered.

There was no legislation during 1941 that altered the status, the functions or the powers of the Federal Deposit Insurance corporation. (*See* also BANKING.) (L. T. C.)

Federal Farm Mortgage Corporation: *see* FARM MORTGAGES.

Federal Home Loan Bank System was created by act of U.S. congress approved July 22, 1932, to provide reserve credit facilities for thrift and home-financing institutions—namely, savings and loan associations, building and loan associations and institutions of similar type. It is supervised by the Federal Home Loan Bank board, composed of five members appointed by the president. The system consists of 12 regional federal home loan banks and their member institutions. The regional banks are in Boston, New York, Pittsburgh, Winston-Salem, Cincinnati, Indianapolis, Chicago, Des Moines, Little Rock, Topeka, Portland and Los Angeles.

Institutions approved for membership are required to invest in the capital stock of their respective regional banks. Of the aggregate stock of the banks, about 73% is held by the government. Beyond their capital stock, the regional banks obtain their funds from the sale of debentures and by accepting deposits from member institutions.

The funds of each bank are used mainly to make advances to members for the purpose of providing additional accommodations to local home owners and investors. Under certain conditions, advances for a short term may be obtained without the deposit of collateral. Long-term advances, which may run up to periods of ten years, must be secured by approved home mortgages or other acceptable collateral.

The bank system has experienced steady and rapid growth. On Jan. 1, 1933, it had but 101 members, with estimated assets of $217,000,000. By June 30, 1941, membership had increased to 3,839, of which 2,346 were state-chartered home-financing institutions, 1,452 federal savings and loan associations, 29 insurance companies and 12 savings banks; their combined assets were approximately $5,300,000,000. On the same date the paid-in capital stock of the bank system amounted to $171,283,200 and the consolidated assets of the banks came to $291,511,973. During 1940, institutions which were members of the bank system made about 40% of the new mortgage loans on urban homes made by all private institutional lenders throughout the United States.

Under the leadership of the regional home loan banks, the member institutions of the system take an active part in the financing of homes for workers in the areas of national defense industries, where such dwellings can be safely financed by private capital. The 3,839 members, with their assets supplemented by the huge credit resources of the system, already have financed thousands of small homes in defense areas during the emergency. Equal effort has been made to stimulate repairs of existing homes and utilization of vacant space to help overcome the acute shortage in crowded industrial centres.

The Federal Home Loan Bank board also administers the Federal Savings and Loan Insurance corporation and the Home Owners' Loan corporation. The latter is also engaged in defense housing activities. (*See* HOME OWNERS' LOAN CORPORATION.)

(J. H. FA.)

Federal Housing Administration. The Federal Housing administration concentrated its efforts in 1941 on aiding national defense and, after declaration of war, the nation's effort for victory. At the same time, new records were established in homes built and in properties improved under the FHA program. Administrator (Jan. 1, 1942): A. H. Ferguson.

Congress amended the National Housing act, under which the FHA operates, by extending title I insurance of property improvement loans through June 1943, and title II insurance of existing-home mortgages through June 1944. There was no time limit on new-home mortgage insurance in the act. Also, congress created title VI, "Defense Housing insurance," to facilitate financing of private construction of defense housing.

Insurance of all types written during 1941 amounted to $1,185,852,709, compared with the previous high record of $1,026,049,609 in 1940, bringing the total amount written from June 1934 through Dec. 1941 to $5,262,117,385. Income for 1941 was more than $26,000,000, of which $13,200,000 went to FHA operating expenses and $12,800,000 to the various insurance funds.

New small homes started in 1941 under FHA inspection totalled 213,777, close to half of all new non-farm homes built, compared with the previous high record of 173,062 started in 1940.

Under section 203 of title II during 1941 the FHA insured 198,799 small-home mortgages for $876,707,384, compared with 168,293 for $736,490,344 in 1940. This amount brought the gross total as of Dec. 31, 1941 to 832,822 mortgages insured for $3,583,060,123. These mortgages are protected by the Mutual Mortgage Insurance fund, which as of Sept. 30, 1941, had net assets of $36,185,411.

Under section 207 of title II (and the repealed section 210), 27 mortgages for $12,997,841 were insured in 1941, financing rental or group housing projects providing 3,001 dwelling units, compared with 48 for $13,017,900 in 1940. As of Dec. 31, 1941, mortgages insured numbered

344 and amounted to $139,950,516, with firm commitments to insure 15 more for $9,369,000. A total of 39,549 dwelling units were provided by the 359 projects. The Housing Insurance fund protecting these mortgages had, as of Sept. 30, net assets of $1,091,055.

Under title VI, 48,617 defense housing mortgages for $180,113,632 were selected for appraisal from April through Dec. 1941; 40,793 for $146,413,340 were accepted for insurance, and 3,778 for $13,431,250 were insured. The Defense Housing fund as of Sept. 30 had net assets of $5,032,093.

Under title I, a total of 687,837 property improvement loans for $282,716,234 was reported for insurance in 1941, compared with 662,948 for $276,541,365 in 1940, bringing the grand total to 3,697,061 loans for $1,525,675,496. These funds were advanced by private financial institutions. The FHA itself lends no money.

The FHA was an officially designated defense agency in 1941. All the homes financed and built under title VI are in defense areas and are primarily for defense workers. About 85% of the new homes financed and built under title II are in important areas of defense activity, as are more than half of the properties improved under title I.

In addition, the FHA acts as an agent of the Office of Production Management (*q.v.*) in processing applications for priority preference in connection with defense housing. This activity is entirely separate from the FHA's insuring functions. (*See* also DEFENSE, NATIONAL [U.S.].)

(A. H. F.)

Federal Land Banks. The 12 federal land banks, which began operation in 1917 under the Federal Farm Loan act of 1916 and subsequent legislation, make long-term first-mortgage loans on farms through 3,600 local co-operative lending institutions known as national farm loan associations. The federal land banks and national farm loan associations also handle the making of land bank commissioner loans. Commissioner loans, made on second as well as first mortgage security, were first authorized in 1933 for emergency financing.

The land banks and local associations after 1933 operated under the supervision of the Farm Credit administration, which also supervises other federally sponsored co-operative lending institutions. Production credit loans in 1941 were made by 530 local co-operative production credit associations, and loans to farmers' co-operatives were made through 13 banks for co-operatives.

Federal land bank loans outstanding on Dec. 31, 1941, amounted to $1,764,398,143, which plus $596,802,174 in commissioner loans represented 34.2% of the total farm mortgage debt of the United States. In 1941 the land banks closed loans amounting to $65,067,729, compared with $64,275,307 in 1940. Commissioner loans made in 1941 aggregated $37,532,699 and $36,663,630 in 1940.

Funds for making land bank loans are obtained primarily from the sale of farm loan bonds to investors. However, repayments on the principal of outstanding loans and other income were sufficient through 1941 to take care of the demands for funds for new loans, and no new public issues of farm loan bonds were necessary. Farm loan bonds aggregating $1,716,233,140 were outstanding on Dec. 31, 1941.

The interest rate paid by farmers with loans through national farm loan associations and by commissioner borrowers in 1941 was 3½%. This rate was provided temporarily by act of congress, and the United States treasury reimburses the banks and Federal Farm Mortgage corporation, which finances commissioner loans, for the difference between the contract rates and the reduced rate. The contract interest rate on most federal land bank loans made during 1941 was 4% and on commissioner loans it was 5%.

The total capital of the 12 federal land banks on Dec. 31, 1941 was $175,071,546, of which 61.4% was owned by national farm loan associations and individual farmers borrowing directly from the banks. The remaining amount was provided by and was owned by the United States government. (*See* also FARMERS' CO-OPERATIVES; FARM MORTGAGES.)

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Federal Loan Agency: *see* EXPORT-IMPORT BANK OF WASHINGTON; FEDERAL HOME LOAN BANK SYSTEM; FEDERAL HOUSING ADMINISTRATION; HOME OWNERS' LOAN CORPORATION; RECONSTRUCTION FINANCE CORPORATION.

Federal Reserve System. During 1941 the United States experienced an unprecedented rate of increase in the volume of its bank credit, caused largely by requirements of the federal government and business concerns for funds to finance the defense program. Commercial banks expanded their loans by about $3,000,000,000 and their holdings of United States government securities by about $4,000,000,000, and thus stimulated a further increase in the already abundant supply of bank deposits and currency. During the year, excess reserves of member banks were reduced from about $6,600,000,000 to $3,100,000,000.

The total reserves of member banks, which had been increasing since 1933, turned downward in 1941, the total shrinkage for the year approximating $1,500,000,000. This decline was the result of an accentuated rise in currency in circulation and an increase of treasury deposits at the federal reserve banks, offset only partially by a further increase in monetary gold stock. Because of increased demands for currency resulting from the expanding volume of wages and retail trade, the amount of currency in circulation rose by about $2,400,000,000 in 1941, as compared with about $1,100,000,000 in 1940. Monetary gold stock increased by $740,000,000 in 1941, as compared with $4,300,000,000 in 1940. Net purchases of foreign gold accounted for about $570,000,000 of this increase; there was about $4,200,000,000 in 1940.

On Nov. 1, reserve requirements on demand and time deposits were raised to the maxima permissible under the law, thereby lowering the volume of potential expansion of bank credit. The increase in requirements reduced excess reserves by $1,200,000,000. This reduction and the continued demand for funds on the parts of government and private borrowers caused short-term money rates to advance in the latter part of the year. The greatest advance was on short-term government securities. The yield on taxable treasury notes maturing in three to five years rose from about .625% in September to about 1% in December, as compared with .75% at the beginning of 1941. New issues of treasury bills, which had sold at practically a no-yield basis at the beginning of the year, sold at a yield of about .3% in Dec. 1941.

Except for a slight decrease at the close of the year, there was a rapid expansion of bank loans during 1941. Most of these loans were for the use of commercial and industrial borrowers. Total loans of commercial banks increased from $18,800,000,000 at the close of 1940 to about $22,000,000,000 at the close of 1941. During the same period, such loans at member banks increased from $5,000,000,000 to $6,700,000,000. Surveys indicated that loans to producers and suppliers of defense goods amounted to nearly $1,000,000,000 at the end of 1941.

The holdings of commercial banks in direct and fully guaranteed obligations of the United States government increased by about $4,000,000,000 during 1941, as compared to an increase in 1940 of $1,500,000,000. About 75% of member bank holdings of securities at the end of the year consisted of such obligations.

As a result of the increase in the volume of bank loans and investments supplemented by the continued inflow of gold, total bank deposits, except for interbank deposits, and currency in the hands of the public increased over $7,000,000,000 during the year, reaching a level of about $78,000,000,000 at the end of 1941. The volume of bank debits, represented mostly by checks drawn on deposit accounts, also rose sharply during 1941, reflecting the greater business activity.

Activity in foreign accounts during the year was relatively limited as a result of the "freezing" orders issued from time to time by executive authority which immobilized bank funds held in the United States by foreigners. Except as licensed, all transactions in assets in the United States belonging to nationals of all continental European countries and several far eastern countries were thus frozen. Transactions in such assets were authorized only if they did not conflict with the national interest. For this purpose, a comprehensive licensing system was administered by the treasury department through the federal reserve banks.

As an aid in curbing inflation by restriction of consumer buying power, an executive order on Aug. 9, 1941 empowered the board of governors of the federal reserve system to control instalment buying and other forms of consumer credit (*q.v.*). As a result of the fixing of minimum down payments and maximum maturities in the purchase of durable goods other than residential building, the demand for such materials was reduced.

On Dec. 8 the board of governors announced that the financial and banking structure of the nation was in a strong position to meet any emergency, and the system was prepared to use its powers to assure that an ample supply of funds would be available at all times for financing the war effort. In addition, the federal reserve banks would continue to advance funds on United States government securities at par to all banks.

In accordance with this policy, the Federal Open Market committee purchased government securities in the open market when prices of such securities declined upon the beginning of hostilities. At the end of 1941, government securities held by federal reserve banks totalled $2,254,000,000, as compared with $2,184,000,000 held during the first 11 months of the year. Yields on long-term government bonds, which had declined earlier in the year, increased during December to a level slightly higher than that prevailing at the beginning of the year. Partially tax exempt treasury bonds with maturities of 12 years and over were yielding about 2% at the close of 1941.

The chairman of the board of governors in 1941 was Marriner S. Eccles; vice-chairman, Ronald Ransom. (*See* also BANKING.)

Federal Savings and Loan Insurance Corporation.

The Federal Savings and Loan Insurance corporation is a permanent instrumentality of the U.S. government created by congress in 1934. Its function is to insure the safety of investments, up to $5,000 per investor, in each federal savings and loan association and in each state-chartered institution of the savings and loan type which applies and is approved for this protection.

Standards of eligibility for applicant associations include sound financial condition, competent management, safe lending policies, ability to meet withdrawal demands and satisfactory earning power.

As of June 30, 1941, 2,310 associations with total assets of $3,160,000,000 had become insured, of which 1,455 were federal savings and loan associations and 860 were state-chartered institutions.

These associations were situated throughout the United States and its territories. Practically all were members of the Federal Home Loan Bank system.

Congress provided $100,000,000 paid-in capital of the corporation. Each insured association pays an annual premium based upon its total share and creditor liability. These premiums are used to build substantial reserves for the protection of insured investors, expenses of the corporation being currently paid from interest on invested reserves. On June 30, 1941, the corporation had accumulated reserves amounting to nearly $30,000,000. (*See* also FEDERAL HOUSING ADMINISTRATION; HOME OWNERS' LOAN CORPORATION.) (J. H. FA.)

Federal Security Agency: *see* CIVILIAN CONSERVATION CORPS; NATIONAL YOUTH ADMINISTRATION; SOCIAL SECURITY.

Federal Union: *see* "UNION NOW."

Federal Works Agency

The Federal Works agency came into existence July 1, 1939, as part of the reorganization plans of that year. Under this new agency of the government were grouped the Public Buildings administration, Public Roads administration, Public Works administration, United States Housing authority and Work Projects administration. The Public Buildings administration was likewise created in 1939 by merging the Public Buildings branch of the treasury (an office of government more than a century old) and the activity of managing public buildings formerly carried on within the department of the interior. The Public Roads administration, formerly the bureau of public roads, was transferred from the department of agriculture. The Public Works administration and the United States Housing authority had been under the supervision of the secretary of the interior. The former Works Progress administration became the Work Projects administration of the new Federal Works agency.

Thus for the first time were unified under one head all the principal construction activities of a civil character in the federal government. John M. Carmody was appointed the first administrator of the Federal Works agency and served until Dec. 1941, when ill-health caused his resignation. He was succeeded by Brigadier General Philip B. Fleming.

As in many other parts of the government, the defense emergency in 1941 made profound changes in the work of the Federal Works agency. Its largest component, the Work Projects administration, managed a diminishing program as millions of workers who had received public assistance returned to private employment, which was expanding under the impact of the defense program. The work relief program, which at the beginning of 1941 had employed 1,890,000 persons, employed only 1,000,000 at the year's end. In the Work Projects administration, as in other parts of the Federal Works agency, emphasis shifted rapidly to programs directly related to the defense emergency, and non-defense activities were curtailed. The Public Works administration was concluding the last of its series of great public works efforts; the United States Housing authority was concluding its initial program of slum clearance and public housing, and the Public Roads administration and Public Buildings administration were winding up large programs in their respective fields.

As these programs declined, new activities were undertaken by the Federal Works agency in the fields of defense housing, defense public works and defense highway construction. To assure homes for defense workers who had migrated to areas where shipping, aircraft, ordnance and other defense products were in the making, congress enacted the Lanham act, Oct. 14, 1940, charging the Federal Works administrator with the responsibility of carrying out a housing program for defense industrial workers and for enlisted men in the army and the navy. By the end of 1941 approximately 50,000 defense homes had been constructed under this authorization and a like number were under way. Through an amendment to the Lanham act in the early summer of 1941, the Federal Works administrator was also empowered to aid in the construction of schools, hospitals, recreation centres, water systems and other community facilities in overcrowded defense areas. Toward the end of 1941 the president approved congressional authorization for the construction of access roads connecting new cantonments and industrial plants with the existing public roads system, and permitting the Public Roads administration to undertake much-needed work to strengthen the nation's highways. In the Work Projects administration many projects of direct value to national defense were undertaken, including the construction or improvement of new roads and airports and a variety of smaller undertakings.

The Federal Works agency in co-operation with the National Resources Planning board likewise undertook to prepare for the day when the emergency would end by creating a Public Work Reserve, a shelf of projects developed in co-operation with local governments that might be undertaken at some future time.

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Federated Malay States.

One of the three principal subdivisions of British Malaya, the others being the Straits Settlements and the Unfederated Malay States (*qq.v.*). There are four federated states, Perak, Selangor, Negri Sembilan and Pahang, of which the first three are on the west coast of the Malay peninsula, while Pahang is on the east coast. Area, 27,540 sq.mi.; pop. (1940) 2,169,313. Individual population figures in 1940 were as follows: Perak, 973,638; Selangor, 688,185; Negri Sembilan, 290,369; Pahang, 217,121. The entire population was racially classified as follows: Chinese, 967,255; Malays, 703,939; Indians, 464,813; Europeans, 10,722; Eurasians, 5,168; others, 17,416.

Each state is administered under the advice of a resident, who is subject to the instructions of the high commissioner, an office which is combined with that of governor of the Straits Settlements. High commissioner in 1941 (appointed in 1934): Sir Thomas Shenton Whitelegge Thomas. The seat of the federal government is at Kuala Lumpur (Selangor), the largest town in the states, with a population (1940) of 138,425. The Japanese had occupied large sections of Malaya by 1942. (*See* WORLD WAR II.)

Education.—Expenditure on education in 1939 was £414,102. There were 48 English schools with 19,138 pupils, 576 Malay schools with 62,-

363 pupils, 523 Chinese schools with 49,614 pupils and 556 Indian schools with 24,246 pupils.

Finance.—Revenue in 1939 was £8,198,888 sterling and expenditure £9,006,473. The debt was £7,616,667.

Communication.—At the end of 1939 there were 3,108 mi. of metalled and 198 mi. of unmetalled roads in the states, with 1,565 mi. of bridle paths.

Agriculture and Mineral Production.—Rubber is an important product of the Federated Malay states, and the area under rubber plantations in 1939 was 1,668,719 acres. In the same year the states produced 51,090 tons of tin, 441,025 tons of coal and 40,283 oz. of gold; 72,954 labourers were engaged in mining. Most of these miners are Chinese, who stand the underground work better than the Malays, who are generally engaged in agriculture, hunting and fishing. Indians are largely employed in the rubber plantations. Coco-nuts, rice, oil-palms, pineapples, tea and timber are subsidiary products of the states. (W. H. Ch.)

Federation of Labor, American: *see* American Federation of Labor.

Feldspar. World production of feldspar is of the order of 400,000 to 450,000 metric tons, of which the United States supplies nearly two-thirds, followed by Sweden, China and Norway, with a number of minor producers. Production of crude feldspar in the United States in 1940 increased to 290,763 long tons, and consumption of ground feldspar to 285,713 short tons, nearly 4% of which was produced from Canadian crude. (G. A. Ro.)

Fencing. With many well-known names in the title events of the national competition conducted by the Amateur Fencers League of America, only one 1940 champion was able to overcome the superior technique of the new crop of contenders, that being Norman C. Armitage of the Fencers club (N.Y.) who again fought his way to victory in the national sabre event. Other national champions for 1941 were Dean Cetrulo, of Salle Santelli, in the foil event, and Capt. Gustave Heiss, of U.S. Army and Fencers club, the winner of the épée title. Miguel A. de Capriles, of Salle Santelli, accounted for the three-weapon championship.

National team honours changed hands, too, as the quartette of the New York Athletic club took the foil team title; the Fencers club (N.Y.) four bested all others in the épée team contest; fencers of Salle Santelli (N.Y.) captured the sabre team championship and also led in the three-weapon team contest. In the two national women's events, Miss Helene Mayer, the Olympic fencer, representing the San Francisco Fencers club, captured the foil championship, and the team of the Fencers club accounted for the foil team title.

The inter-divisional championships, covering the eastern, midwest and Pacific coast sections of the U.S., also showed an improvement in the quality of fencing.

In the all-eastern championships, Miguel A. de Capriles took the outdoor sabre title; Dean Cetrulo, the foil events; Arthur Tauber, épée; Douglas Gerard, sabre; and Miss Dorothy Lancaster, women's foil title. N.Y.A.C. fencers took the foil and épée team titles, and Salle Santelli fencers captured the sabre and women's foil championships. The midwest and Pacific coast championships were well contested.

Intercollegiate Fencing.—New York university fencers retained their three-weapon crown and foil team title and also added the épée team event. Harvard and City college tied for first in the sabre event. Arthur Tauber of N.Y.U. again won his épée honours, Charles Steinhardt of St. Johns, gained first in the foil and G. P. Stokes of U.S. navy won the sabre. (J. B. P.)

Fertilizers. The war throughout the world almost completely dislocated world trade in fertilizer raw materials. Even were these materials available, scarcity of ships and war blockades would prevent their transportation to other countries in normal quantities. Chile continued to export nitrate of soda in reasonable amounts to Great Britain and the United States when ships were available. With war in the Pacific as well as in the Atlantic (Dec. 1941), shipments might be curtailed temporarily.

Each belligerent nation expanded its capacity for the fixation of atmospheric nitrogen. In the United States, for instance, the synthetic nitrogen fixation plants under construction and entering production were expected to have a capacity much greater than any peacetime consumption of nitrogen compounds in industry and agriculture. In addition, construction of other fixation plants was authorized and in some cases started. A similar condition no doubt existed in most of the other industrial countries at war.

Increased production of steel required more coke. This resulted in greater production of by-product sulphate of ammonia. Increased production of lard and vegetable oils resulted in greater production of animal tankage and vegetable meals. All these provided additional supplies of nitrogen-bearing fertilizer materials useful in carrying out national programs for increased food production.

Phosphate rock deposits known to be of great extent are confined to the U.S.S.R., North Africa and the United States. War activities in the Mediterranean interfered greatly with African operations. South America and the British empire were being supplied by the United States. The U.S.S.R. and the United States are self-sufficient. For the duration of the war the rest of the world was expected to face a shortage of phosphates.

Potash was being produced in the United States in sufficient quantity for the requirements of the western hemisphere. Spain was beginning to produce again; the U.S.S.R. could satisfy its own needs; but the known deposits of the rest of the world were in Germany or in territories occupied by Germany. It seemed probable that production of potash in the United States would be increased sufficiently to fill at least part of the needs of the British empire.

There were expected to be serious domestic and international dislocations of commerce in fertilizer materials because of transportation difficulties and perhaps because of man-power shortage. War priorities and allocations resulted in supplying munition needs first and other war and civilian needs later. But fertilizers are essential to achieve the agricultural production goals demanded by war and must therefore receive preferential consideration. Statistics were of little value. Authentic figures were suppressed as military secrets. (C. J. Br.)

FHA: *see* Federal Housing Administration.

FHLB: *see* Federal Home Loan Bank System.

Fiction: *see* American Literature; Canadian Literature; English Literature; French Literature; Italian Literature; Russian Literature; Spanish-American Literature.

Fields, Lew (Lewis Maurice Fields) (1867–1941), U.S. comedian, was born Jan. 1 on New York's east side. At the age of 10 he rigged up a vaudeville act with Joe Weber, a neighbourhood friend of the same age, and thus launched a lifetime partnership on the stage. In 1932 Weber and Fields held their golden jubilee and then retired, except for a few bit parts in Hollywood and Broadway productions. Fields died in Los Angeles, July 20. (See *Encyclopædia Britannica.*)

Fiji: *see* Pacific Islands, British.

Filoff, Bogdan Dimitrov: *see* Philoff, Bogdan Dimitrov.

Financial Review: *see* Business Review.

Finger, Charles Joseph (1869–1941), U.S. author, was born Dec. 25 in Willesden, England. He attended private schools in England and studied music in Germany, then shipped as a deckhand to Patagonia in search of adventure. In succeeding years he visited Mexico, Africa and the Klondike. He interspersed his travels with a three-year stay in a Texas town, where he headed a music conservatory, and from 1906 to 1920 he managed a group of railroads in Ohio. It was not until he had reached the age of 52 that Finger emerged as a successful writer with publication in 1921 of his first book, *Choice of the Crowd.* In 1925 his *Tales from Silver Lands* won the Newbery medal of the American Library association for the most distinguished contribution to juvenile literature. In 1929 he won the Longmans, Green & Company contest prize for juvenile fiction with *Courageous Companions.* In 1930 his autobiography, *Seven Horizons,* won acclaim as a work of literary distinction. Other works were: *Golden Tales from Far and Near* (1939); *Cape Horn Snorter* (1939); and *Fighting for Fur* (1940). He died Jan. 7 at Fayetteville, Ark.

Finland. An independent republic of northern Europe. Area, 134,000 sq.mi. (land area, 121,000 sq.mi.), after cession of 13,500 sq.mi. to the U.S.S.R. in 1940. The population of about 3,800,000 was not materially reduced by the cession of territory, because most of the 450,000 people affected moved into other parts of Finland. Capital, Helsinki; pop. (est. Jan. 1, 1939), 304,965. Other principal cities are Turku (74,315) and Tampere (76,730). Viipuri (74,247) was ceded to the U.S.S.R. in 1940 and was recaptured in 1941. Langauge and nationality, 90% Finnish, about 10% Swedish. Religion, Lutheran Christian. President in 1941, Risto Ryti.

History.—Finland was beaten into a bitter desperation by the soviet invasion of 1939–40 and the treaty it was forced to sign on March 12, 1940. By this treaty it had lost its famous border city of Viipuri and extensive territory; some 500,000 people were left homeless; and the flower of its youth had been slaughtered or maimed. With the German attack on Norway in April 1940, the general war closed in more tightly around Finland. The work of reconstruction was made more difficult by the cutting of trade routes—Finland could neither sell its goods nor buy necessities. Sweden had given lavishly to aid Finland in the war, but Swedes could not supply Finns with food or the commerce needed for rebuilding. In 1940 Germany alone seemed both able and willing to be of real aid to Finland, and Germany had been friendly in times past—as in 1918, when the Finns had also been fighting against the age-old enemy to the east.

When, in the summer of 1940, Germany asked for permission to send troops through Finland to Norway, most Finns were glad to see them—perhaps their presence would give warning to the Russians not to make a second attack. During the winter and spring of 1941 some German soldiers began to camp in Finland, but few people worried, except the Russians, who reported on April 26 that 12,000 German troops had landed at Turku. The British public thought that the Russians were just parading a ghost for some purpose known only to themselves. Meantime a carefully suppressed controversy on neutrality was agitating Swedish-Finnish diplomacy. Forebodings of trouble accumulated. The British government sent a note to Helsinki announcing that no "navicerts" for ships to Petsamo would be issued after June 14, 1941, because they regarded Finland no longer "free." The British navy intercepted and detained three Finnish ships. On June 18 came rumours of a Russian exodus from Hangö, their leased base in southwestern Finland. The same day word leaked out that Finnish soldiers and "Lottas" were crowding the streets of Helsinki. On June 20 the Finns reported Russian military movements in Lithuania and declared general mobilization. Two days later the Germans struck at the U.S.S.R. in the south, and on June 27 President Risto Ryti announced that the Russians had again attacked Finland, and that "for the liberty of the fatherland" Finland was going to war alongside Germany and "their genial leader, Reichschancellor Adolf Hitler." For the third time in 23 years Baron Mannerheim led his troops against the Russians. On Aug. 30 the Finns could proclaim the recapture of Viipuri (Viborg), though in sadly devastated condition. Long thrusts into soviet territory were made all along the frontier, but the fortifications of Leningrad could not be pierced. (*See* WORLD WAR II.)

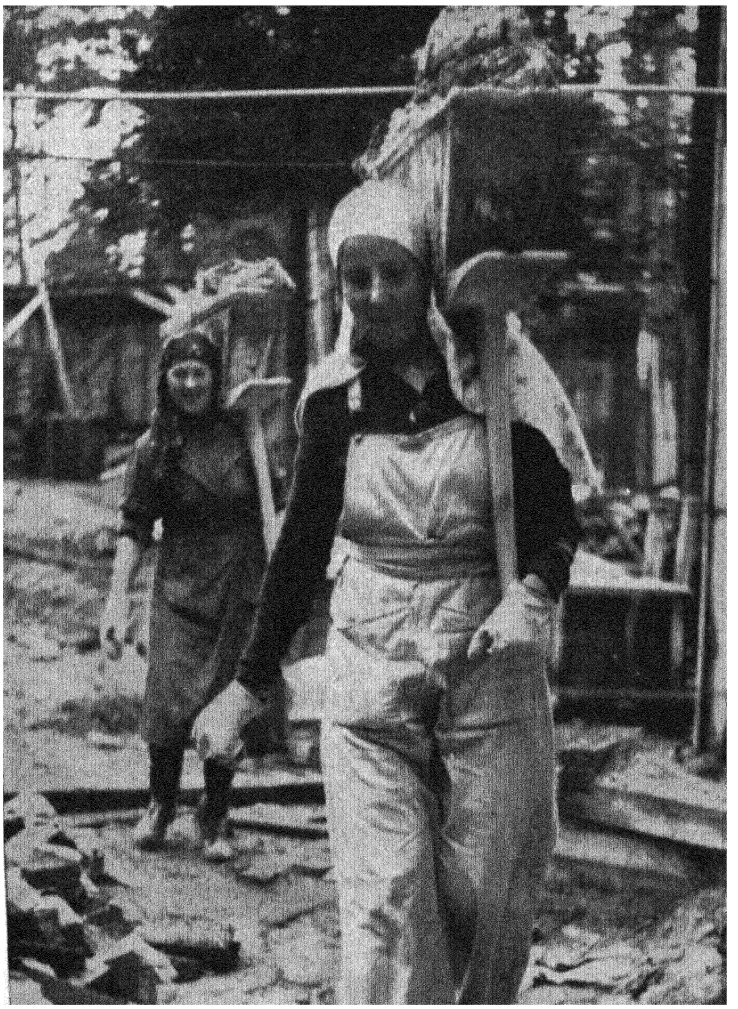
After Sept. 1941 reports recurred that Finland was about to make a separate peace, and individual Finns declared that their country wanted only the old boundary and would stop fighting when that was reached. Official denials were made repeatedly. Through Washington channels the U.S.S.R. in mid-August was reported willing to discuss peace with Finland (denied in Moscow). Whether by independent decision or through pressure from Berlin, the Finnish government clung to its policy; on Nov. 25 Finland signed the anti-Comintern pact with the axis countries; on Nov. 29 Premier J. W. Rangell won a unanimous vote of confidence from the parliament. But by this time Russian appeals and their own interests had brought the British to the point of a declaration of war on Finland (Dec. 6). U.S. Secretary of State Hull had warned Finland early in November that it must cease fighting the soviet state or lose U.S. friendship. After the British declaration of war, the United States government took into custody six Finnish vessels in its ports.

Finland had agreed in May to a plan for making up the debt payments to the United States, suspended in 1939 and 1940. Within the country two reconstruction loans, for 1,000,000,000 marks ($20,000,000) each, were subscribed before the middle of August. Building and clearing were proceeding on the assumption that within 20 years arable land could be doubled, and before that time Finland could be producing beyond its own needs. Compensation for war losses was being paid by the state to individuals up to amounts of 2,000,000 marks ($40,000). But problems were staggering even before the renewed war with Russia. The wholesale price index, based on 1935=100, had risen to 164; food prices were up nearly 60%, machinery 40%. From Jan. 1940 to June 1941 industrial production for export sank to 55%, and foreign trade to 40%. Agriculture yielded poorly and lard had been curtailed. Sugar, coffee, etc., were rationed strictly. Thus marched Finland into war in June 1941.

Education.—In 1939 there were some 11,200 elementary schools, with 411,000 students and 13,500 teachers; there were 383 professional schools in 1937 with 20,583 students, 68 middle schools with 8,546 students, and 150 lyceums with 42,034 students. There were five universities, of which that at Helsinki was the largest (enrolment, 6,461 in 1938).

Finance.—The monetary unit is the Finnish markka (=2 U.S. cents approximately; at the last free quotation in 1939, 49 FM=$1). Budget (est. 1939): revenues, 5,534,700,000 FM; expenditures, 5,432,800,000 FM;

BETWEEN TWO WARS, Finnish women in 1941 did the work of men in rebuilding their nation's bomb-torn cities



foreign debt (Sept. 1939), 1,040,000,000 FM; internal debt (Sept. 1939), 2,810,000,000 FM; note circulation (April 1, 1941), 5,720,000,000 FM.

Defense.—Service in the army is compulsory for men between the ages of 17 and 60. Effectives in 1938 numbered 2,012 officers, 31,000 men; in 1941, reports varied between six and nine divisions (90,000–135,000 men). The navy in 1939 included two coast defense vessels of 4,000 tons each, four gunboats, seven motor-torpedo boats, three mine layers and five submarines. In 1939 there were three air regiments of three squadrons each. The women's Lotta Swärd organization was exceptionally active, and the 100,000 civic guards were an integral part of the military machine in 1941.

Trade.—Exports (1938) totalled 8,431,111,000 FM; (1940) 2,870,000,000 FM; imports (1938), 8,612,283,000 FM; (1940) 5,180,000,000 FM. Major export commodities, with their values in 1940, were as follows: pulp, paper, etc., 950,000,000 FM; timber and wood, 1,200,000,000 FM; foods of animal origin, 70,000,000 FM; metals and metal goods, 200,000,000 FM; hides, skins, etc., 90,000,000 FM; minerals, 80,000,000 FM. Major import commodities with values in 1938: metal and metal goods, 1,420,500,000 FM; machinery and apparatus, 1,120,300,000 FM; minerals, 661,100,000 FM; colonial products, 585,500,000 FM; oils, fats, waxes, 503,300,000 FM; transportation equipment 482,900,000 FM. Great Britain, Germany and the United States were the leading importers of Finnish products, while the same three countries plus Sweden supplied most of Finland's imports.

In the first quarter of 1941 imports of civil goods totalled 1,348,000,000 FM; exports, 552,000,000 FM. Particularly exports were thus still far below normal, a fact which was accentuated by adjusting figures to prices much higher than in previous years. (Index figure 164 against 100 in 1935.)

Communication.—Railways (1938) totalled 3,530 mi. and carried 21,200,000 passengers and 15,710,000 tons of freight in 1937. Buses in operation numbered 2,500 in 1937; 20,300 mi. of main highways were maintained by the state. In 1938 there were 185,456 telephones in operation, 1,593 mi. of telegraph lines, 18 broadcasting stations and 293,790 radio sets.

Agriculture.—The chief crops in 1939, with their yields in short tons, were as follows: oats, 879,635; wheat, 250,222; barley, 211,642; rye, 364,861; potatoes, 1,715,179. Livestock in 1937: 380,038 horses; 1,925,078 cattle; 1,072,307 sheep; 10,372 goats; 504,164 pigs; 100,356 reindeer; 2,814,960 poultry; 18,374 beehives.

Manufacturing.—In 1937 there were 4,246 establishments which employed 207,506 workers and produced goods valued at 21,076,045,000 FM. The chief products and their values were as follows: wood and paper, 9,428,919,000 FM; food and luxuries, 3,453,956,000 FM; textiles, 2,264,267,000 FM; machinery, 2,113,012,000 FM; metal, 1,767,424,000 FM; leather and rubber, 946,071,000 FM.

Mineral Production.—Following are the chief mineral products of Finland and their output in 1938: pyrite ores (113,514 tons); pyrites (sulphur content) (48,811 tons); copper ore (15,542 tons); copper (13,483 tons); gold (3,858 oz.); and silver (57,900 oz.). (F. D. S.)

Fire Insurance: *see* INSURANCE, FIRE.

Fires and Fire Losses.

For the year 1941 the fire loss in the United States amounted to about $322,357,000. These statistics were furnished by the National Board of Fire Underwriters, the recognized authority for this form of information. The losses by fire were 5% greater than in 1940 and were the largest since the year 1932, when the figure was $442,000,000. Beginning with 1933, the losses dropped sharply, but during 1940 and 1941 there was a steady increase. For each month of the year 1941 the fire loss was approximately $25,000,000; in only four months did it fall slightly below that amount. In March it rose to $31,000,000 and that also was the figure reached in December.

The substantial increase in 1941 over the previous year was largely due to one fire. There always is some one outstanding event in the fire loss picture, and the Fall River, Mass., fire was the one in 1941. On Oct. 12 occurred that serious fire, with an estimated loss of $15,000,000, due to the destruction in part of the factory and warehouse used in the making of rubber products and the storage of the rubber necessary therefor. The increase of $16,000,000 in fire loss over the year 1940 was almost entirely accounted for by this one extraordinary fire.

The increasing activity since 1939 accounted for the increasing fire loss during that period. The pressure under which plants were being operated would, even under very normal conditions, produce a larger number of fires than when operations proceeded at a more modest rate. The question of sabotage was raised, but the records did not show any effect on the fire loss because of such activities. (E. R. H.)

Great Britain.—Certain steadying influences were at work in fire insurance during 1941. The shock to the business caused by the war had been duly absorbed, and fire insurers had been able to adjust their business to new conditions. The premiums received during 1940, as shown in the accounts published during 1941, in almost all cases showed a slight increase over 1939, averaging about 5%. This was a result of the strong position established in past years by British fire offices throughout the empire and on the American continents, and it was achieved in spite of the loss of business due to the closing of European branches and agencies in the countries overrun by the enemy during 1940. The process was further assisted by some adjustments in the distribution of fire reinsurance business, so that a considerable volume formerly placed with European reinsurers returned to Great Britain and was digested by the home market. An important volume of business also was handled by British insurers through the government commodity insurance scheme, under which certain staple commodities taken over or controlled by the government and situated in various parts of the world are insured with the British market against fire and special perils. First made during 1940, this arrangement returned to normal insurance channels a large block of business which had been withdrawn after the outbreak of war. It proved its worth during 1941 and was extended with advantage to the interests concerned.

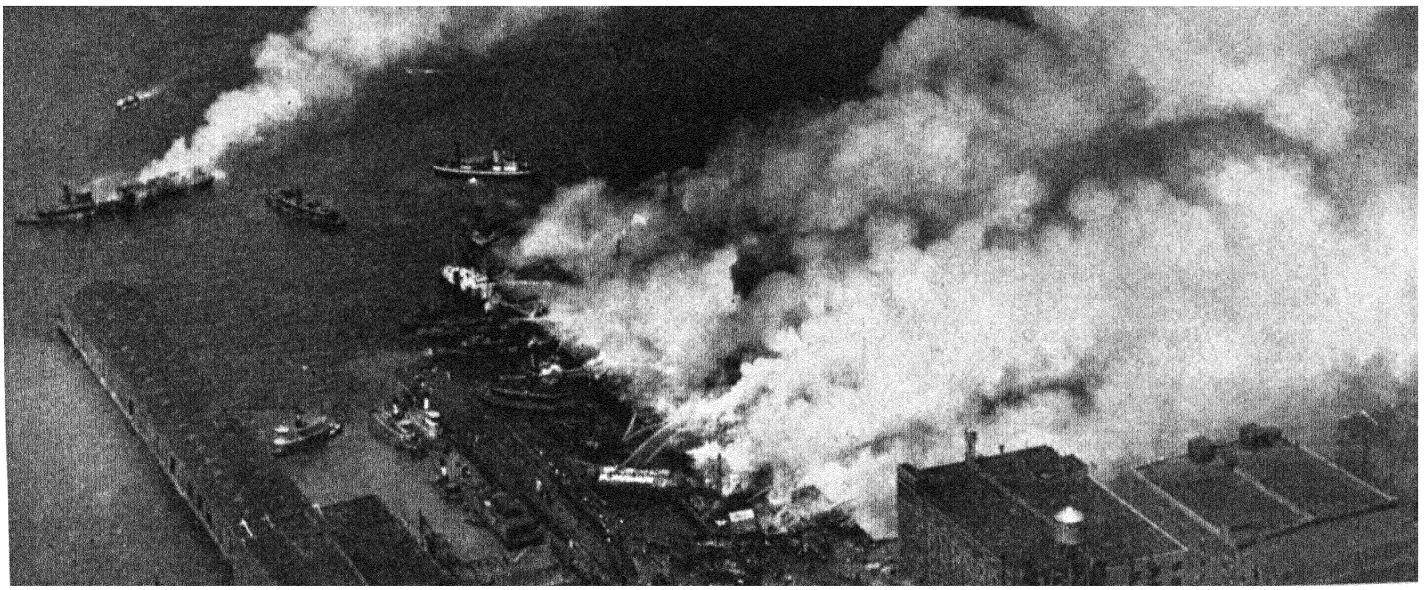
Upon the passing of the War Damage act, 1941, fire insurers were appointed agents of the board of trade to carry out the business and private chattels schemes as provided in that act. The understanding is that those desiring coverage under either of these schemes should apply to the insurer carrying the relative fire insurance.

When the full loss experience of 1940 became available, that year showed a most costly result, the figures in the home field being the highest for some 20 years past. The total home losses as estimated in the monthly returns amounted to £12,640,400 in 1940, compared with £9,088,000 in 1939 and £8,780,800 in 1938. The corresponding figures for 1941 showed a considerable improvement. The estimated home fire losses for the period of nine months to the end of Sept. 1941 appeared at £7,391,000 as against £9,337,000 for the same period of 1940.

Europe's figures come much more slowly to hand, but there was in 1941 one serious conflagration at Santander in Spain. Nothing could be done in 1941 to liquidate outstanding loss liabilities in the overrun countries of Europe and this matter could only be suspended until after the war. Further progress, however, was made towards settling claims arising out of the Spanish Civil War, and so far as riot losses were concerned arrangements were made for the payment of two-thirds of the claims, the remaining one-third to be carried forward. Fire claims arising out of the civil war were being dealt with by a national syndicate. (*See* also DISASTERS; INSURANCE, FIRE.) (C. E. G.)

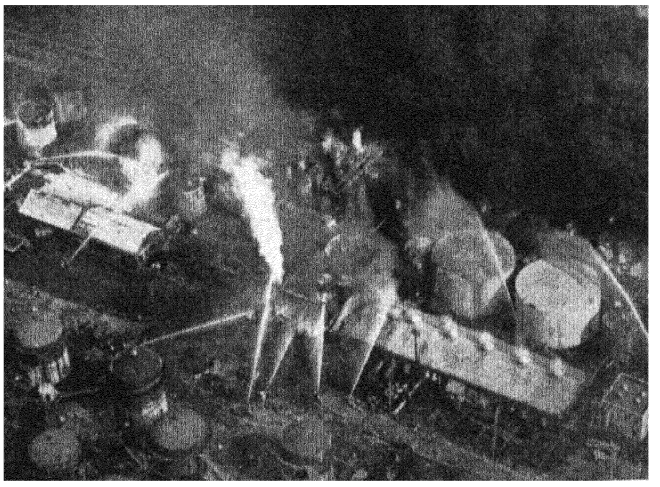
Fish and Wild Life Service.

Of foremost importance in all the service's activities in 1941 were its efforts to contribute in every possible way to national defense. At the same time, however, steps were taken to prevent unnecessary damage to the fish and other wild life resources during the emergency. At President Roosevelt's request, an official of the service was appointed by the secretary of the interior as a liaison officer to keep informed of defense activities that affect fish or other wild life. Not only was the liaison beneficial in connection with emergency activities, but it was also probable that improved standard practices and policies would be developed. Co-operation in national defense included emphasis on the food value of fishes, on predator and rodent control, and on the intangible but highly beneficial contributions to individual and national morale that result from recreation in areas where wild life is abundant.



Above: A FIRE ORIGINATING IN CARGO unloaded from the freighter "Panuco" spread rapidly through a large Brooklyn pier Aug. 18, 1941 and killed more than 30 longshoremen and sailors

Above: DEFENSE STORES valued at $25,000,000 were destroyed May 31, 1941 in a fire which swept through a large area of the Hudson river waterfront at Jersey City, New Jersey



Above: A FIRE which started in the naphtha treating plant of a huge refinery at Whiting, Ind. Sept. 24, 1941 spread rapidly to other buildings and tanks before it was brought under control

Below: ONLY BRICKWORK REMAINED upright in the Ocean Bluff section of Marshfield, Mass. April 21, 1941 after a fire destroyed 325 cottages; no casualties

DROPPED F[illegible] 10,000 fingerling brook and rainbow trout were stocked in Redfish lake, Idaho in the summer of 1941 with a loss of only one per cent. The lake is in an almost inaccessible part of the Sawtooth mountains, near Sun Valley

During the first year of its existence, the fish and wild life service (which was established on June 30, 1940, by consolidation of the bureau of biological survey and the bureau of fisheries) was also concerned with administrative and organizational adjustments and improvements. Entering the year 1941 as a new agency, the service had to carry on and coordinate the activities of two formerly separate bureaus. No drastic changes were made. A consolidated administrative division was established and public-relations work was centralized in one division, but the operating units were continued with few readjustments. Activities were coordinated, however, in so many instances that the advantages of the consolidated service were being constantly realized.

Under Dr. Ira N. Gabrielson, director, the service included divisions of wild life research, fishery biology, federal aid in wild life restoration, land acquisition, wild life refuges, construction and Civilian Conservation corps operations, game management, fishery industries, fish culture, Alaska fisheries, and predator and rodent control. W. C. Henderson and Charles E. Jackson were assistant directors. Regional field headquarters are in Portland, Ore.; Albuquerque, N.Mex.; Minneapolis, Minn.; Atlanta, Ga.; Boston, Mass.; and Juneau, Alaska.

The food value of the commercial fishes is indicated by a survey showing that in 1939 the fishermen of the United States and Alaska took 4,443,328,000 lb. of fishery products valued at $96,532,000 to the fishermen. So important is this source of food regarded that members of the service were appointed to committees of the National Defense Advisory commission and of the Office of the Administrator of Export Control. They also contributed extensively in furnishing inventories of fishery commodities, assisting in drawing specifications for fishery products, and supplying information useful to military purchasing agencies and federal food-planning organizations. Estimates of the possibilities for increasing this food supply led to the conclusion that a 46% increase could be realized over a period of years and that under conditions of wartime emergency the yield could be increased to 4,628,000,000 lb. almost immediately and to 6,200,000,000 lb. after a few years.

Protection was afforded livestock, poultry and game during the year by the taking of 122,941 predatory animals in co-operative control work, thus providing additional safeguards to wool and meat supplies. Cultivated crops, timber and forage resources, irrigation and soil-conserving structures, and stored food and feed supplies were protected from rodent damage through the treatment, under the service's supervision, or general direction, of 25,321,902 ac. of rodent-infested lands and 104,267 rat-infested premises. An acute shortage of high-grade red squill, an important raticide, resulted when the U.S. was cut off from the source of supply in the Mediterranean, and to meet this problem scientists of the service developed a method for the practical fortification of low-grade squill. In co-operation with the bureau of plant industry of the department of agriculture, steps were also taken to determine whether squill might be satisfactorily grown in the United States.

Other activities of the year were in the main continuations of programs already under way. Estimates compiled indicated that the big-game population of the United States in 1939 was more than 5,800,000. The annual waterfowl inventory in Jan. 1941 resulted in an estimate of more than 70,000,000 ducks and geese, representing the sixth consecutive annual increase as a result of the restoration program. Compilations of state reports indicated that in the 1939–40 seasons more than 7,600,000 persons paid a total of almost $13,000,000 for hunting licenses. Sales of the federal stamp required of all over 16 who hunt migratory waterfowl continued to increase, a total of 1,257,313 stamps having been sold in the 1940–41 year. Output of fish and eggs at the 116 federal hatcheries during the year ended June 30, 1941, approximated 6,020,000,000, a drop from the previous year's 7,400,000,000 attributed mainly to curtailment of cod, haddock and pollock production.

The program for aiding the states in wild life restoration increased. In all, 265 projects, involving $2,964,648, were begun by the states in this program, which provides for federal payment of 75% of the cost of projects carried on by the states with federal approval. (*See* also FISHERIES.)

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Wild Life Conservation.—The "Convention on Nature Protection and Wild Life Preservation in the Western Hemisphere" which was approved and recommended for signature by the governing board of the Pan American union, as a result of the sessions of the Eighth American Scientific congress held in Washington, May 10 to 18, 1940, was expected to come into force early in 1942. The convention provides for international agreements and co-operation "to protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna, including migratory birds, in sufficient numbers and over areas extensive enough to assure them from becoming extinct through any agency within man's control" and "to protect and preserve scenery of extraordinary beauty, unusual and striking geologic formations, regions and natural objects of aesthetic, historic or scientific value, and areas characterized by primitive conditions." Under its terms the convention would come into force three months after the deposit of not less than five ratifications with the Pan American union. Latin-American signatories representing 17 countries and the United States were already on file, and the ratifications of four—Guatemala, Salvador, Venezuela and the United States—had been deposited with the Pan American union at the close of the year. The Dominican Republic ratified the convention, but its ratification had not been deposited with the Pan American union up to the close of 1941.

Cuba was one of the early signatories and afforded a striking example of the beneficial results that might be derived from the convention as a motivating influence. A proclamation by the president of Cuba established lists of species of wild life to be entered for Cuba in the annex of the convention. Twenty-five species of migratory birds, including the jabiru stork and the roseate spoonbill, were to be given permanent protection. Such protection was also extended to three native species of quail doves, the Cuban parrot and the Cuban parakeet. Cuban mammals placed on a permanent protection list were the manatee and three species of rodents, all hutias of the genera *Capromys* and *Geocapromys*. The establishment of four national wild life refuges and a national park was also proclaimed. A refuge for flamingos included the northern and southern coasts of the provinces of Santa Clara and Camaguay. Wild life refuges and national parks were also established in other Latin-American countries.

Federal Aid to States.—Notable progress was made during the year in carrying out the provisions of the Federal Aid to Wild Life Restoration act (50 Stat. 917), known also as the Pittman-Robertson act, which became effective on July 1, 1938. Under the act, federal aid to wild life was extended through large scale co-operation with the states. The act authorized operating appropriations of not to exceed the annual revenue from the 10% tax on sporting arms and ammunition. Wild life restoration projects were outlined, and if approved, the participating state paid 25% and the federal government 75% of the cost. To carry on the work for the fiscal year 1942, the sum of $2,750,000 was appropriated by congress.

Federal aid restoration projects were being carried out on 2,254,355 ac. in Texas. New Mexico and Texas trapped and moved 1,046 antelope to suitable but unpopulated habitats. Wisconsin and the fish and wild life service co-operatively were acquiring the Horicon marsh of 31,500 ac., long known as an area especially favoured by waterfowl. At the end of the year there were 342 active projects in 46 states, Alaska, Puerto Rico and the Virgin Islands.

Bird Refuges.—There were (Jan. 1, 1942) 267 refuges—an increase of four—for all forms of wild life, administered by the fish and wild life service, department of the interior, aggregating 13,740,304 ac. Of these, 251 (9,646,072 ac.) were in the United States and 16 (4,094,232 ac.) were in Alaska, Hawaii and Puerto Rico. Of the total, 253 (7,098,166 ac.) were primarily for birds and 14 (6,642,138 ac.) were mainly for big game, but wild life in general was accorded protection on all refuges. Of the four new refuges established by executive orders during the year 1941, three were expressly for birds and one primarily for big game. Two of these—the Havasu Lake refuge and the Imperial refuge, containing 47,841 ac.—were water storage projects of the bureau of reclamation on the Colorado river between California and Arizona. Their principal wild life use was as wintering and resting grounds for migratory waterfowl, especially ducks, in an arid region where water areas were few and far between. The Thief Valley refuge (1,495 ac.) in Baker and Union counties, Oregon, another reclamation project, was also made available as a waterfowl wintering area. The San Andres refuge, Dona Ana county, New Mexico, containing 57,215 ac., was set aside primarily for desert bighorn sheep of a type threatened with extinction. Antelopes and mule deer would also receive needed protection.

The response of refuge areas to stabilized water levels, planting of marsh and aquatic vegetation, range revegetation, reforestation, controlled grazing and protection from fire was spectacular. Areas which in 1937 presented desolate pictures of the effects of unwise drainage, drought, overgrazing and general land abuse presented in 1941 entirely different aspects

owing to remedial measures. Dry lake beds and drained marshes again supported luxurious stands of vegetation and attendant wild life populations. Overgrazed and eroded uplands were rapidly becoming covered with protective vegetation, furnishing food and cover for wild life where only barren soil or noxious weeds were present before. More waterfowl were produced on the nesting refuges during 1941 than ever before since their establishment. Large increases also were noted in the number of birds spending the winter on many of the refuges or stopping to rest and feed during migration periods; and on a number of refuges where the development of waterfowl habitat had been completed, fur animals increased to a point where large-scale removals became necessary. Upland game birds also showed decided increases on many of the refuges.

Evidence that wild life populations increased as a result of habitat improvement was the necessity of removing surpluses in order to keep resident species within the bounds of the available food supply. Some refuges were subject to joint use by waterfowl, or upland game birds, and big game animals; and on others the limited grazing by domestic stock was permitted in accordance with a broad policy providing for the most advantageous land use. During the year, deer were removed from the Aransas refuge, Tex., Blackbeard Island refuge, Ga., Cape Romain refuge, S.C., and National Bison range, Mont., for restocking state and federal lands. Wild turkeys, elk, and antelopes also were removed from several refuges, and more than 8,000 ring-necked pheasants were taken from the Sand Lake refuge, S.Dak., and 400 from the Camas refuge, Ida., for the same purpose. About $92,500 was realized from the sale of surplus big game and fur animals and other refuge products and privileges. In accordance with the law, 25% of this was turned over to the counties in which the refuges are situated and the remainder deposited in the federal treasury.

More than $1,257,000 were made available during the fiscal year ending June 30, 1941, for the continuance of the migratory waterfowl restoration program through the sale of migratory bird hunting stamps as provided for under the Migratory Bird Hunting Stamp act (49 Stat. 379). Ninety per cent of these funds were used for acquiring, developing and administering refuges for migratory waterfowl, and 10% for the enforcement of laws for the protection of migratory birds and the expenses of the post office department in engraving, issuing and accounting for the stamps.

(E. A. G.)

Fisher, Clarence Stanley (1876–1941), U.S. archaeologist, was born Aug. 17 in Philadelphia, Pa. After graduating from the University of Pennsylvania in 1897, he was sent by the university's museum directors on an archaeological expedition to Nippur, Mesopotamia; the results of his findings were published in a six-volume report. He later made expeditions to the near east for Harvard university and the Boston Museum of Fine Arts. In 1926 he accepted a professorship in archaeology at the American School of Oriental Research in Jerusalem, later becoming acting director. Among his outstanding achievements were the discovery in 1920 of the gravestones of Seti I and Rameses II, and the excavation at Memphis of the Palace of Merneptah. Dr. Fisher died in Jerusalem, July 20.

Fisher, Frederic John (1878–1941), U.S. manufacturer of motor car bodies, was born Jan. 2 in Sandusky, O., the eldest of seven brothers. He learned the trade of wheelwrighting and smithing at his father's smithy and in 1902 he went to Detroit to work in a carriage plant. In five years he became manager of the plant. His success lured the other six brothers to Detroit, and the Fisher brothers organized in 1908 the Fisher Body company with their uncle as president. Subsequently the brothers bought out the uncle's interest for $50,000, and under Frederic Fisher's enterprising management, the company's expansion paralleled the enormous development of the motor industry. In 1923 the General Motors corporation bought the company for $208,000,000, retaining all the brothers in executive positions in the corporation. Frederic Fisher was vice-president and general manager of General Motors from 1924 to 1934, after which he and his brother Charles resigned. At the time of his death he held directorships in a score of companies. He died in Detroit, July 14.

Fisheries. The fisheries of the world, according to the tabulation of the U.S. fish and wild life service, annually yield about 17,500,000 tons, of 2,000 lb. each, of food and industrial products, with a value of about $762,000,000. The fisheries conducted in the North Atlantic area by bordering countries produce 7,550,000 tons, valued at $374,000,000; with the production by eastern North Atlantic countries amounting to 6,100,000 tons, valued at $310,000,000, and by western North Atlantic countries to 1,450,000 tons, valued at $64,000,000. The species of importance in the North Atlantic area include herring, cod, haddock, mackerel, halibut, swordfish, crabs, shrimp and oysters. The production of some of these species has declined, due to over-fishing or other causes. As this is a threat to the livelihood of many hundreds of thousands of fishermen and shore workers and to the food supply of nations, the various governments concerned took steps in previous years to conserve and sustain these fisheries. Because of the need for foodstuffs, created by the war situation, however, little was accomplished in this direction. In fact, in some of the warring countries conservation regulations were relaxed in an effort to increase fish production, without regard to the effect of unrestricted operations on the maintenance of fish supplies in the sea.

As a result of the war, generally, operations by warring nations were considerably curtailed. In Great Britain and the Union of South Africa it has been estimated that well over one-half of the fishing fleet was taken over by the admiralty. The remainder found it difficult to conduct fishing on the usual banks. In order to make up for the deficiency of its domestic fisheries, Great Britain looked to other sources for fishery foods. Considerable dependence was placed in supplies of salted and canned fish from Newfoundland and Canada, salted fish from Iceland and under the lend-lease program of the United States large quantities of canned salmon and sardines were sent to England from Alaska, California and Maine. Because of difficulties in securing refrigerated cargo space on transports and of holding chilled fish in cold storage in England, the importation of frozen fish was practically suspended. Furthermore, since the English people were accustomed to eating the domestic catch of fish in a fresh condition, frozen fish did not find ready sale. Efforts were made, however, to promote the use of the imported salted fish. A schedule of maximum selling prices for canned salmon, sardines, herring and pilchards continued in effect in Great Britain under orders of the ministry of food. Measures also were taken in Great Britain to regulate prices of other types of fish products, one measure prohibiting the sale of fish at wholesale except under licence.

While the situation in the warring countries was not conducive to normal fishing operations during 1941, various other countries took renewed interest in exploiting the fishery resources. For instance, the cessation of imported canned fish in New Zealand caused local fish canners to expand the canning of mullet, kingfish and oysters. Several fish canneries also were erected in Australia. In India the government issued instructions for curing fish. The government of Java conducted experimental trawling studies to locate new fisheries and technical work in fish preserving. Several Japanese floating crab canneries were converted over to codfish canneries and were said to have conducted operations in Bering sea during the summer.

The shrimp fishery on the west coast of Mexico was enlarged and a shrimp-freezing company, owned by Mexican nationals, was inaugurated. Chile conducted a sizeable fishery, a considerable portion of the catch being canned and marketed in other South American countries.

In some of the occupied countries the fisheries were again receiving attention. Fishing results in Denmark were exceptionally satisfactory. There was a good catch and domestic and export prices were high, due to a scarcity of meat. In Norway and Sweden efforts were made to expand fish oil production for fat stuffs. Norway also was using fish oil as a substitute for olive oil in canning sardines, and was developing a dried fish briquette. It is said this product could be stored for ten years at varying temperatures without suffering any damage. Germany contracted to purchase large quantities of codfish from Norway, much of which was re-exported to Italy. Also Norway arranged to export 40% of the 1940–41 winter herring catch to Germany and several other European countries.

The fisheries of North America, which annually yield over 3,000,000 tons on both coasts and in the interior waters, were prosecuted with renewed vigour in 1941. In Canada efforts were made to increase production of tinned fish to meet the demand for food in Great Britain. The pack of salmon in British Columbia amounted to about 2,500,000 cases, an increase of about 800,000 cases over the previous year, and there was a great increase in the output of canned herring. On the Atlantic coast of Canada experiments were in progress to develop a new type of dehydrated fish product for the warring countries to replace frozen or canned fish.

In Newfoundland the export market for salt cod, which is the main outlet for this product, improved. The government, however, continued its efforts to improve the economic status of the fishing industry by extending to the industry fishing guarantees and shipbuilding bounties, by encouraging co-operative associations among fishermen to reduce marketing costs, by the development of new exportable fishery products such as salted herring and herring meal and oil, and by developing methods for producing cod liver oil of higher quality.

The position of the fishing industry in the United States improved during 1941, brought about by a higher price structure and an increase in the production of fish to supply an increased demand among both the civil and military populations. During the year the United States government continued the purchase of fishing vessels for conversion into naval craft, most of which were replaced by new and more efficient vessels.

The international convention for the conservation of the North Pacific fur seal terminated in Oct. 1941 as a result of a notice of abrogation given by the government of Japan dated Oct. 23, 1940. Signator countries to the convention, made effective in 1911, were the United States, Great Britain, Japan and Russia (U.S.S.R.). Any treaty power may terminate the treaty

by giving one year's written notice to all other parties to the treaty. In 1941 the fur seal herd of the Pribilof Islands, administered under the convention by the department of the interior through the fish and wild life service, numbered over 2,338,000 animals. When the treaty became effective the herd numbered about 125,000 animals. In the interim, to and including the season of 1941, about 895,000 surplus animals were taken under regulated conditions for their pelts. Proceeds from their sale each year have been divided among the signator countries. The Japanese authorities had indicated informally that it was not the intention of the Japanese government to abandon the possibility of effecting a new convention for regulating the taking of North Pacific fur seals, and there would be no legislation in Japan before April 1942 relative to conditions under which Japanese nationals might engage in pelagic sealing.

The production of canned salmon in Alaska was greater in 1941 than in the previous year, amounting to about 6,865,000 cases. This was due mainly to a larger output of pink salmon. U.S. packers' stocks of all grades of canned salmon at the beginning of the last quarter of 1941 were about 1,500,000 standard cases, or about 100,000 cases less than on hand at the same time in 1940. The total pack of canned salmon in North America (Alaska, British Columbia, Pacific Coast states) amounted to 9,850,000 cases in 1941, compared with 7,000,000 cases in 1940. Increased quantities of fish and shellfish were frozen during 1941.

The U.S. government concluded an expedition to explore areas for king crabs off the Alaska peninsula and to conduct studies in the capture and canning of this shellfish which was begun in the fall of 1940. In 1941 three fishing vessels were used in the expedition. Operations were centred off the south coast of the peninsula during the early spring and along the north coast during the summer and early fall. The expedition returned to Seattle, Wash., about the middle of September. This fishery heretofore had been carried on by Japanese vessels and fishermen. As a result of this exploratory work by the U.S. government it was found that a commercial crab fishery was feasible, especially in Bering sea where the crabs are most abundant before and after the salmon season.

In various countries of South and Central America an interest was shown in exploiting local fishery resources. Attention was directed mainly toward producing marine products for domestic consumption to replace foods from abroad. In this connection individuals from several South American countries made investigations of the fisheries in the United States, and under the U.S. government's program for co-operation with other American republics several were assisted in fishery matters. In this connection a mission of fishery experts from the fish and wild life service conducted a survey of the Peruvian fishery resources. (*See* also FISH AND WILD LIFE SERVICE.)

During 1941 interest was continued by various countries in securing an adequate supply of fish oils potent in vitamins A and D. Exports of cod liver oil from Norway to the United States, ceased. Canada prohibited the export of cod liver oil except under licence approved by the Wartime Prices and Trade board, and in order to increase production a cod liver oil plant was established in Quebec. A strong demand, with prices higher than in the United States, resulted in increased shipments of Newfoundland cod liver oil in favour of Great Britain. In view of this condition, manufacturers and importers of vitamin fish oils in the United States continued to exert efforts to augment domestic supplies. The fishery in California for soupfin sharks, the liver of which is potent in vitamin A, was prosecuted intensively, and a new fishery was developed for this shark as well as dogfish in waters of the state of Washington. The meat of this shark and dogfish is of little commercial value. These were instances in the U.S. where a fishery was developed because of an unusual value placed on a visceral organ. The manufacture of synthetic vitamin D received impetus because of world events. One such product was based on irradiated cholesterol derived from sea mussels. The manufacture of this product also created a new fishery for sea mussels which was conducted along the coast of Virginia. Heretofore this mussel had little or no market value. In the United States interest also was shown in the extraction of vitamin A and D concentrates from certain low-cost fish oils, without rendering the original oil unfit for its normal use in the manufacture of soap, paint and other products. Efforts also were made during the year to locate sources of vitamin-bearing fish oils in other American republics. Some supplies were found in Peru and possibly in Argentina.

Whaling.—During the two decades from 1920 to 1940 the whale fisheries of the world were prosecuted with renewed vigour. Operations were centred almost entirely in the Antarctic. Previously little whale fishing was done in this area because of dangerous weather and ice conditions. In the recent years, however, such adverse conditions were no obstacle to the staunchly built factory ships and killer boats. The take was enormous. During the period from the season 1919–20 (the inception of the fishery on a large scale in the Antarctic) to the 1938–39 season, inclusive, 421,708 whales were captured in this region, from which 32,741,897 bbl. of oil were produced. Due to war conditions complete data were not available on the production in the Antarctic during the seasons 1939–40 or 1940–41. In the latter season it is believed the fishery there was conducted almost entirely by Japanese vessels. (*See* also OCEANOGRAPHY.)

(R. H. F.)

Fisheries, Bureau of: *see* FISH AND WILD LIFE SERVICE.

Flax: *see* LINEN AND FLAX.

Flint: *see* ABRASIVES.

Floods and Flood Control.

The world did not experience any large disastrous floods in 1941. Melting ice and snow caused many local floods in various parts of the world. These local flood waters caused some crop and property damage in many areas.

In the southwestern United States sudden violent rainstorms called cloudbursts took their usual toll by causing violent streams to arise in usually dry gulches, with disastrous damage to highways and railroads.

During the rainy season, on various parts of the earth's surface, floods occurred due to climatic conditions over which man has little or no control. When there is over 225 in. of rain falling on the headwaters of the Amazon river in Ecuador there must be inevitable floods in the lowlands in Brazil. Similar floods occurred on the Ohio and Mississippi rivers in the United States, on Hwang Ho in China, the Ganges in India and the Nile in Egypt although, according to available information, not to the extent as in some previous years.

In California, in January, February and December, floods due to torrential rains, caused severe damage approximating conditions resulting from the 1937 floods in this area.

The month-long rain in the Sacramento valley and in the headwaters of the Sacramento river and its tributaries caused the Sacramento river to pour over its levees, creating a lake which submerged some of the smaller towns and caused widespread damage to ranches, towns, highways and railroads.

There is little that man can do to protect himself from such floods as prevailed in California in 1941. Flood reservoirs, such as those projected by some engineers of the day, would be of trivial consequence in meeting such downpours and stream run-offs as those that occurred in some of the California sections. Under ordinary flood conditions they would doubtless prevent great damage at times, but when the heavens open, as they did during this period in 1941, and millions of tons of water are concentrated into the canyons and ravines within a very few hours, no ordinary works of man can hold them. Human beings must then pay for the advantages they acquired when they settled in the low spots.

The completion of the great Shasta dam on the Sacramento river, near Redding, Calif., by 1943 was expected to be helpful in controlling these flood waters.

In September, torrential rains in the Mogollon mountains made raging torrents of the Gila and Frisco rivers in southwestern New Mexico. Farm lands were inundated and damage to livestock was caused. The Hondo river inundated the streets in the residential district of Roswell, N.Mex.

The heavy rains which caused these floods extended into Mexico and 20 lives were lost in the floods in the village of San Vicente Chicoloagon on the Mexico City-Pueblo highway.

The rains caused the Missouri river to rise and some concern was felt regarding damage to the industries along the Missouri river. A major flood has not occurred on the Missouri river since 1903, but since that time many industrial plants in North Kansas City and Kansas City have been erected along the unprotected lowlands bordering the river.

Five miles of the Kansas City industrial section on the Kansas side of the river has been partially protected by the completion of a very elaborate levee. The September minor flood threatened the airport and temporary sandbag levees were erected to keep the water from the runways used by the Transcontinental airways. A flood of the size of 1903 would probably send 10 to 15 ft. of water over the municipal airport and destroy factories and industries in several districts and submerge much of the lowland area.

The control of floods by levees and dams in the headwater of the rivers and its contributaries is very helpful in flood control. Much has been done in this connection but much remained to be done. The great Boulder dam on the Colorado river has regulated the flood waters of that river for several years. The Bonneville and Grand Coulee dams on the Columbia river helped regulate the flood waters of this river although these two projects were primarily for the production of hydroelectric power.

(Ro. St.)

Federal Control.—General flood control legislation provided up to Jan. 1, 1942, authorizations totalling $930,400,000 for the construction of nearly 500 reservoirs and local flood protection projects widely dispersed throughout the entire United States. These projects were incorporated in comprehensive, co-ordinated plans for the beneficial development of the river basins of the nation, and they provided economic flood protection for a large number of centres of population and industry and to many thousands of acres of rich agricultural lands. Many of the authorized reservoirs were suitable for multiple-purpose use for flood control in combination with the development of hydroelectric power and other purposes.

The Flood Control act approved Aug. 18, 1941, modified certain conditions of local co-operation prescribed in previous flood control legislation. As the policy stood (Jan. 1, 1942) dam and reservoir projects, because of their general benefits over large areas, were usually built entirely at federal expense and were maintained and operated by the federal government. As the benefits provided by other types of flood protection projects were more local in character, contributions by the communities protected were usually required. The amount of this local co-operation of contribution depended upon the circumstances of each case, but generally the minimum requirements were that the local interests should provide without cost to the United States all lands, easements and rights-of-way needed for the project, hold the United States free from damages due to the construction works, and maintain and operate the works after completion in accordance with regulations prescribed by the secretary of war.

The act of 1941 authorized the construction of projects at about 90 localities and also modified several projects which had been approved in the previous Flood Control acts. Of particular note were the multiple-purpose projects for flood control, the generation of hydroelectric power and other allied uses which that act adopted. These were the Allatoona reservoir on the Etowah river, Ga.; the Whitney reservoir on the Brazos river, Tex.; the Narrows reservoir on the Little Missouri river, Ark.; the

SEVERAL PERSONS were drowned and hundreds were left homeless in the vicinity of Carlsbad, N.M. when the Pecos river overflowed its banks in May 1941

Bull Shoals and Table Rock projects on the White river in Arkansas and Missouri; and the system of reservoirs on the Grand (Neosho) river in Oklahoma.

The Federal General Flood control program had been under way continuously since 1937, when the first funds for that purpose were appropriated by congress. During 1941, 30 dams and 125 projects for local flood protection were under construction. Of particular importance were the several multiple-purpose reservoir projects for flood control and power which were being rushed to completion to augment the power demands of national defense industries. The more important of the latter type of project were the Denison reservoir on the Red river, Texas and Oklahoma; the Norfork reservoir in the White river basin in Arkansas; and the Wolf creek project on the Cumberland river, Ky. Additional important dams for flood control and power development were planned to be initiated early in 1942. Numerous reports on investigations authorized by congress were completed and submitted to congress in 1941. Many other authorized studies begun in previous years were carried on vigorously and a large number of new investigations were started in compliance with congressional directives.

One phase of flood control which became of great importance was its value to national defense. All flood control projects, being directly connected with the national economy, were either directly or indirectly related to national defense. This connection is entirely clear when it is remembered that one major flood in a large river basin, such as the Ohio or Mississippi, may cause in a short time many times the damage and disruption of industrial production that result from many air raids. The value of multiple-purpose reservoir projects producing power is obvious. Another type of multiple-purpose project important to national defense is a reservoir for flood control and stream flow regulation. The Berlin project on the Mahoning river, O., was expected, when completed, to protect the important steel producing areas of Youngstown and Warren, O., from floods and would increase the low water flow in the stream from which those industries obtain their industrial water supply.

Several local flood protection projects were also found to be of special importance because they protected vital manufacturing establishments. An example was the levee and flood wall for the protection of the Guyandot section of Huntington, W. Va., where a large nickel refining plant was located in a zone formerly subject to severe flooding from the Ohio river. (For a listing of floods occurring in 1941, *see* DISASTERS: *Natural Disasters.*) (J. L. S.)

Great Britain.—During the war there has been great activity in the control of floods in river areas, not only because of the damage to property by occasional floods but to reclaim arable land for the production of foodstuff; many thousand acres of such land have been brought under cultivation.

Increased interest has been taken in the catchment boards which in addition to controlling the rivers and streams, have sometimes to protect the coast from sea flooding. The East Norfolk Rivers Catchment board took over the control of about 10 mi. of coast line when, in Feb. 1938, the high seas made a breach, 1,800-ft. wide, and flooded a low-lying area of 15 sq.mi. cutting off villages and damaging farms and farm land. An attempt to close the breach was soon made but a further breach occurred in March. Steps were then taken for a permanent defense bank, the work of which has been successfully carried out.

The River Great Ouse Catchment board was formed to control the whole catchment area of the Great Ouse and its tributaries, covering an area of more than 2,000,000 ac. It is one of a number of districts adjacent to the Wash inlet from the North sea, into which flow rivers draining 5,850 sq.mi. of territory. In these rivers not only are there changes of levels by erosion in some areas and deposits of silt in others but the gradual seaward shifting of the coast line, at the head of the inlet, complicates the whole problem of dealing with the rivers.

The many schemes which have been tried, to reduce the volume of the flooding, have not been entirely successful. There were new schemes submitted to deal with the problem, each of which had certain advantages. One of the schemes included the digging of a new channel to divert the upland water into higher and more solid ground, the channel to begin at Grantchester and to discharge into the tidal river at St. Germans. The estimated cost of the whole scheme was about £3,460,000.

Egypt.—Two new barrages, at the apex of the Egyptian delta, for regulating the flow of water on the river Nile, were constructed on the Rosetta and Damietta branches of the river. These barrages take the place of others which were constructed between 1860 and 1870. Toward the end of the 19th century defects were found in the floors and the foundations of the barrages; to remedy the defects the effective head on the structures was reduced by construction of weirs downstream.

In order to pass more water down the three main canals the Egyptian government decided, in 1935, to construct new barrages under the name of the Mohammed Ali barrages; these were completed and brought into use in 1940. The cost of the works was approximately £2,500,000.

The Assuit barrage, on the river Nile, was remodelled in order to raise the level of the river, upstream of the barrage, so as to provide more water for the Ibrahimia canal.

India.—Schemes were in progress in 1941 in the Punjab to bring 1,000,000 ac. of the Thal desert under cultivation, designed to bring the Indus waters into an area between the Indus and the Jhelum rivers.

On the Sutlej river, also in Punjab, the proposed Bhakra dam site has a catchment area of some 21,460 sq.mi. on the Himalayas and it was proposed to impound about 5,000,000 ac.-ft. of water. (*See* also DAMS; FORESTS; IRRIGATION; METEOROLOGY; SOIL EROSION AND SOIL CONSERVATION.) (J. EU.)

Florida. An extreme southeastern state of the United States, called the "Peninsula state" because of its peculiar outline. Its coast line is greater than that of any other state, extending 472 mi. along the Atlantic and 674 mi. along the Gulf of Mexico. Area, 58,560 sq.mi., of which 4,298 sq.mi. are water surface; pop. (1940) 1,897,414, of which 1,045,791 were urban and 851,623 were rural; 1,384,365 white and 513,049 Negroes. Only about 60,000 were foreign born. Capital, Tallahassee (16,240). The larger cities are Jacksonville (173,065), Miami (172,172) and Tampa (108,391).

Florida gained an additional representative in the census of 1940, who was to be chosen in 1942.

The state elective administrative officers, whose terms expire in Jan. 1945, were as follows in 1941: Spessard L. Holland, governor; R. A. Gray, secretary of state; J. Thomas Watson, attorney general; J. M. Lee, comptroller; J. Ed. Larson, state treasurer; Colin English, superintendent of public instruction; and Nathan Mayo, commissioner of agriculture.

Education.—The state maintains two higher institutions of learning for whites: the University of Florida at Gainesville and the Florida State College for Women at Tallahassee, with enrolments of 3,438 and 1,968 students and teaching staffs of 197 and 143 respectively in 1941. The state's higher institution of learning for Negroes, the Florida Agricultural and Mechanical college, is located at Tallahassee and had an enrolment of 876 and a teaching staff of 81 in 1941. State appropriations for higher education for 1939–40 amounted to $2,299,760.

The biennial report of the state superintendent of public instruction for 1939–40 showed enrolment in the public schools through grade 12 as follows: white, 291,528; Negro, 105,460; total, 396,988.

There were 2,001 elementary and 828 secondary public schools in the state, with instructional staffs totalling 13,629 teachers, of whom 10,339 taught in the schools for whites and 3,290 in the schools for Negroes.

Municipally operated institutions of learning are the University of Tampa and St. Petersburg college. John B. Stetson university at DeLand, the University of Miami at Coral Gables, Rollins college at Winter Park and Southern college at Lakeland are privately endowed institutions.

Public Welfare, Charities, Correction.—Florida appropriated for pensions, benefits and public welfare about $13,756,000 in 1940–41. From grants by the federal government, the state received in 1940–41, for old-age pensions $2,892,206; for dependent children $490,421; and for pensions to the blind $214,181. There was collected from employers for unemployment insurance $26,910,821, from which benefits were paid out amounting to $13,533,551, leaving a balance with accrued interest in trust fund of $14,319,320. Considerable WPA and PWA money was expended in the state on which reliable total figures were unavailable in 1941.

Florida has no state penitentiary, but maintains a prison farm at Raiford, an Industrial School for Boys at Marianna and an Industrial School for Girls at Ocala. The appropriation for these institutions in 1941 carried the sums of $606,600, $155,280 and $59,500 respectively.

The state also supports a State Hospital for the Insane, the Florida Farm colony for the feeble minded, and the Florida School for the Deaf

and Blind. For the operation of these charitable institutions the appropriations were $1,578,010, $171,250 and $198,271 respectively in 1941–42.

Communications.—The total highway mileage of the state in 1941 was 13,378.6 mi., of which 8,000 mi. were paved or hard-surfaced. The construction costs in 1939 were $1,349,240.09 and the maintenance costs $3,256,951.43; while in 1940 the construction costs were $3,466,632.51 and the maintenance costs $4,176,638.37.

Florida in 1941 had about 6,000 mi. of railroads, of which the Atlantic Coast line, Seaboard, Florida East Coast and the Louisville and Nashville are the most important.

Banking and Finance.—On June 30, 1941, there was a total balance in the treasury of $13,323,115.68. The state is constitutionally forbidden to incur a debt except to put down rebellion or repel invasion, hence the state as such had no bonded indebtedness in 1941; however, the counties and municipalities had incurred in some cases a large bonded debt by issuing bonds, usually for roads and schools. Florida had no state income tax in 1941 and the state by constitutional amendment had abolished its *ad valorem* tax on real estate. Homesteads were exempted from taxation by local taxing units up to the value of $5,000.

On June 30, 1941, there were within the state 52 national banks with deposits amounting to $420,492,000 and 116 state banks and trust companies with deposits of $120,690,000, representing total deposits of $541,182,000, a gain in deposits of $89,350,000 in the fiscal year.

Agriculture, Manufactures and Minerals.—Agriculture is the most important industry in the state. In 1935 there were 72,857 farms with a total acreage of 6,048,406 ac., of which 1,142,767 were in crops, 489,006 were idle (fallow), 2,362,374 were in pasture, 1,140,941 were in farm woodland and the rest mainly in fruit.

The citrus production for the season 1940–41 and the estimates for 1941–42 were as follows: oranges (including tangerines) 29,800,000 boxes and 31,300,000 boxes; grapefruit 21,000,000 boxes and 21,400,000 boxes.

Table I.—*Principal Agricultural Products of Florida, 1941 and 1940*

Crop	1941	1940
Corn, bu.	7,533,000	9,031,000
Tobacco, lb.	12,125,000	16,123,000
Potatoes, bu.	3,190,000	4,312,000
Sugar cane, short tons	119,000	101,000

On Jan. 1, 1941, the livestock resources of the state were as follows: 753,000 beef cattle, 117,000 milch cows, 538,000 swine, 35,000 sheep, 20,000 horses, 41,000 mules.

Manufacturing.—The more important manufactures of the state in 1941 were lumber, naval stores (turpentine and rosin) and cigars.

In the 12 months' season, April 1940 to March 1941, Florida produced 4,328,000 gal. of gum turpentine and 294,000 bbl. (500 lb. each). Estimated 1940 output of lumber was about 602,000,000 bd.ft., mainly cypress and yellow pine.

The cigars manufactured in Florida are valued at about $20,000,000 annually. Tampa and Jacksonville are the leading cities in this industry. Tung oil and the production of paper pulp and the manufacture of paper are also important industries.

In 1937 the state had 1,835 manufacturing establishments, paying $36,501,359 to 52,005 workers and producing $217,044,982 worth of goods. In 1939 there were 2,083 establishments, paying $37,883,204 to 52,728 workers and producing $241,538,534 goods.

Mineral Production.—Florida has only limited resources in minerals, but has large and valuable deposits of phosphates, lime and limestone and less extensive, though highly valuable deposits of kaolin and fuller's earth. The mineral production of the state was valued at $13,060,453 in 1939 and $12,866,981 in 1940.

Table II.—*Principal Mineral Products of Florida, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Phosphate rock	$7,893,457	$8,773,680
Stone	1,462,730	1,223,438
Sand and gravel	779,708	672,106
Lime	215,472	185,286

(J. M. L.)

Flour and Flour Milling.

During 1941 the major influences affecting the flour milling industry were (1) the war and (2) the flour enrichment program. In the United States the latter influence was by far the most spectacular in effect and widespread in influence. In Canada and in Britain, however, the most significant developments of 1941 might be attributed directly to the war, although in some sections of the British empire the flour enrichment program was not without some effect.

Throughout the U.S. the flour and bread enrichment program developed with such rapidity that by the middle of the year a shortage of certain vitamins, particularly thiamin and nicotinic acid, became acute. For some time it appeared as though the entire program might be curtailed until the productive capacity of the vitamin producers could be sufficiently expanded to meet the unprecedented demand.

To some degree the situation with respect to fortified or "enriched" flour in Britain paralleled that in the U.S. except that owing to the absolute wartime control of the food industries—particularly the milling and baking industries—the fortification program was intentionallly retarded until the vitamin supply appeared adequate to provide the millers and bakers with sufficient vitamin concentrates to meet fully the standards of vitamin content which were set up by the ministry of health as announced on July 18, 1940. (*See* also VITAMINS.)

In Britain it was not until June 18, 1941, that Lord Woolton, the minister of food, announced that arrangements had finally been completed for the introduction of vitamin- and mineral-fortified flour in an area in South Wales. As sufficient supplies became available, it was expected that the enrichment program would be extended throughout England, in spite of the fact that there was some controversy over the ministry's intention of calcium fortification of flour and bread.

Credit for the exceptionally well co-ordinated development of the enrichment program in the U.S. is due to a large number of scientists, executives and government officials, including Dr. Russel M. Wilder, chairman of the Committee on Foods and Nutrition, National Research council; Dr. W. H. Sebred, U.S. Public Health service; Major General E. B. Gregory, quartermaster general in the U.S. army; Peter G. Pirrie, editor *Bakers' Weekly;* M. L. Wilson, assistant director of Defense, Health and Welfare Service in Charge of Nutrition, Washington, D.C.; and G. Cullen Thomas, vice president in charge of research, General Mills, Inc.

Standards of Identity.—U.S. federal standards of identity and definitions for flour and other wheat products were published in the *Federal Register* in May 1927. However, because of the shortage of riboflavin, the effective date with respect to vitamin content of "enriched" flours was postponed to Jan. 1, 1942. The riboflavin requirement, despite protests of the Millers' National federation, and others, was left the same as it appeared in the proposed standards published April 1, 1941, calling for a minimum of 1.2 mg. and a maximum of 1.8 mg. per lb. Other required ingredients, according to Paul V. McNutt's announcement, were to remain unchanged.

Production.—Wheat stocks reported as of July 1, 1941, were estimated by the Crop Reporting board, Washington, D.C., at 73,240,000 bu., which is more than double the 33,618,000 bu. held in interior mills, elevators and warehouses on July 1, 1940, and is the highest July 1 interior stocks of any year since these estimates had been made. These figures indicated that there should be no shortage of wheat for flour production in the North American continent during 1942.

Japan, on the other hand, because of its inability to obtain flour or wheat supplies from the Americas, would, according to a report of the Canadian trade commissioner in Tokyo, be rather short on wheat flour requirements. According to reliable estimates of the Japanese National Millers' association, Japan requires at least 7,000,000 bbl. of wheat flour per year, while the milling capacity of Japan is only 1,500,000 bbl. Because of the trend toward the occidental mode of living, there has been a gradual replacement of wheat flour for rice flour, and wheat bread had become, prior to the war, an important article in the daily diet of the Japanese.

Production of flour in the U.S. during 1941 reached the greatest total since the season of 1931–32, output for the crop year ending June 30 amounting to 105,330,437 bbl., representing an increase of about 900,000 bbl. over the production of the previous crop year.

Further gains in U.S. production of flour were reported Nov. 10, 1941 by the bureau of the census of the department of commerce. The output for Sept. 1941 amounted to 9,495,471 bbl., compared with the August total of 8,592,209 bbl. For the first nine months of 1941 a gain of 1,668,102 bbl. over 1940 was reported, according to data representing 94.6% of the total U.S. milling capacity.

Wheat-Peeling Process.—A new wheat-peeling process for the manufacture of a new type of whole wheat flour was announced on April 7 by M. Lee Marshall, head of the Continental Baking company. The process employed was described as "revolutionary" and embodied the use of a number of flotation cells, lined with rubber, against the insides of which the wheat is impelled with sufficient force to fracture the branny layers without crushing the endosperm. This process was developed and patented by Theodore Earle, a mining engineer of southern California. The new "whole wheat" flour made by Earle's process was first produced in the latter part of February and the mill at Kansas City, which was designed and built according to Earle's specifications, had been operating at its full capacity of 1,000 bbl. per day since the first of March 1941. (*See* also BREAD AND BAKERY PRODUCTS.)

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(H. E. BA.)

Fluorspar.

World production of fluorspar is 500,000 metric tons, of which the United States produces about one-third, Germany slightly less and most of the remainder comes from the soviet union, France and Great Britain. The United States output increased heavily in 1940, to 233,600 short tons, and consumption to 217,200 tons. Both mine and consumer stocks increased to a total of 164,500 tons. Imports dropped to 11,871 tons.

mostly from France, Newfoundland and Mexico. (G. A. Ro.)

Folk Dancing: *see* DANCE.

Food and Drug Administration: *see* DRUGS AND DRUG TRAFFIC.

Football.

Football, generally, had a normal season in the United States in 1941. Conscription took few players, and in the main the teams suffered little in loss of personnel or at the box office, though the outlook for 1942 was dubious unless hostilities should be brought to an early conclusion.

For the United States as a whole, there was an increase in attendance of 4% over 1940. Every section shared in it with the exception of the Pacific coast, where the quality of the football was not quite up to the usual high standard. The record crowd of the season—100,000 persons—saw Navy defeat Army for the third successive year. The Southern California-Stanford game at Los Angeles drew 87,000 and Michigan attracted 85,000 for its meeting with Minnesota and the same with Ohio State. Notre Dame played to well over 400,000 and Pennsylvania drew 358,000 for its six home games.

The outstanding team of the country was Minnesota. For the second successive year, the Golden Gophers beat all opponents, running their winning streak up to 17. They were voted the No. 1 team of the country in a national poll.

Behind Minnesota were ranked Duke, Notre Dame, Texas, Michigan, Fordham, Missouri, Duquesne, Texas A. and M. and Navy. Also strong were Northwestern, which lost to Minnesota and Notre Dame by a point each, Pennsylvania, Oregon State, Mississippi State, Ohio State, Georgia and Harvard.

Minnesota, Duke, Notre Dame and Duquesne went through without defeat. Notre Dame was tied once, by Army, which made big strides under its new coach, Earl Blaik. Notre Dame, under its new coach, Frank Leahy, enjoyed its first unbeaten season since 1930, Knute Rockne's last year. Leahy, continuing his marked success at Boston college, was voted the coach of the year, barely beating out Bernie Bierman, whose Minnesota teams had won eight Big Ten championships. The outstanding player of the season was Minnesota's great halfback, Bruce Smith, who was voted the Heisman Memorial trophy over Notre Dame's famous sophomore passer, Angelo Bertelli.

The sectional champions were as follows: Big Ten, Minnesota; Big Six, Missouri; Pacific Coast, Oregon State; Southwestern, Texas A. and M.; Southern, Duke; Rocky Mountain, Utah; Missouri Valley, Tulsa; Southeastern, Mississippi State. Fordham was voted the No. 1 team of the east in the balloting for the Lambert trophy, and Navy, Duquesne and Penn were outstanding also. Navy won the Ivy Crown; Harvard, the Big Three; and Williams, the Little Three.

Oregon State was picked to represent the Pacific coast in the 1942 Rose Bowl game for the first time and invited Duke as its opponent. The game was transferred, because of the war, from Pasadena, Calif., to Durham, N.C., and was won by Oregon State, 20 to 16.

In the Sugar Bowl at New Orleans, La., the rivals were Fordham and Missouri. Victory went to Fordham by the score of 2 to 0.

Texas A. and M. and Alabama met in the Cotton Bowl at Dallas, Tex., the latter winning by 29 to 21.

In the Orange Bowl at Miami, Fla., Georgia won from Texas Christian, 40 to 26.

The big surprises of the season were furnished at the expense of Texas and Fordham. Texas, rated the best team in Longhorn history, suffered a stunning tie with Baylor and then was beaten by Texas Christian. Dana Bible's team vindicated itself later by decisively ending the winning streak of Texas A. and M., as it did in 1940, and then concluding with an amazing 71–7 rout of Oregon. Fordham, after winning its first five games, was the victim of Pittsburgh, which had lost five in a row.

Aside from Ossie Solem's reversal of his centre at Syracuse, to pass the ball facing his backfield, there was no innovation in offense comparable with the revival of the T formation by Stanford and the Chicago Bears of the National Professional league in 1940. Harvard caused a stir with the variety and flux of its defense, using as many as 28 variations and a sliding, looping line that confused opponents' blocking assignments. The new free substitution rule worked out satisfactorily.

Professional Football.—Professional football also had a thriving season. The New York Giants, after clinching the eastern championship, drew 55,000 in their final game with Brooklyn, which was too good once again for the Giants. The Chicago Bears, 1940 champions, and the Green Bay Packers tied in the Western Division, and in the playoff, before 43,000 in Chicago, the Bears won by 33–14. The Bears and the Giants then met for the national crown at Chicago and the Bears won by a score of 37 to 9.

Canada.—As in the United States, football continued to have a large following in the dominion despite the war, though the restrictions imposed upon all intercollegiate athletics since the outbreak of hostilities remained in force.

The East-West final for the dominion championship, abandoned in 1940 because of the failure of the western representatives to conform to the rule of the Canadian Rugby union regarding the use of interference, was renewed. The rule was changed, allowing linemen to block five yards ahead of the line of scrimmage and backs one yard ahead, as compared with three yards ahead for linemen and one yard behind the line of scrimmage for backs under the old rule. The rule permitting forward passing from any point behind the line, in force in U.S. professional football and followed for several years in western Canada, was accepted by the Canadian Rugby union as legal.

The Winnipeg Blue Bombers, Western Interprovincial Football union champions, won the dominion crown and the Grey Cup by defeating the Ottawa Rough Riders, eastern champions, 18–16, before 20,000 at Toronto. The Blue Bombers were national champions in 1939 also. They won the western title for the fifth successive year by defeating the Regina Roughriders 8 to 2 in the rubber game after losing the first 8 to 6 and winning the second 18 to 12.

The Ottawa Rough Riders defeated the Hamilton Wildcats for the eastern championship by 7 to 2. They had previously taken the championship of the Big Four by winning the two-game series with the Toronto Argonauts on a total point basis, 18 to 17. The Argonauts won the first contest 16 to 8 and the Rough Riders took the second, 10 to 1. (A. Da.)

Great Britain.—The organization of rugby and association football, amateur and professional, in 1941 proceeded on much the same lines as in the previous year. In the rugby union game professionals serving with the forces played with the amateurs, and in view of the fact that professionals and amateurs in peacetime follow different rules, it was interesting to see how well they fitted in. The outstanding sides were Cambridge university and Saint Mary's hospital. Cambridge beat Oxford at Cambridge fairly easily, while St. Mary's won nearly all their matches, though when it came to the "sevens" at the end of the season they were beaten by Middlesex in the hospitals competition and by the Welsh Guards in the Middlesex competition. G. T. Wright, the Cambridge outside half, and T. A. Kemp and F. M. McRae of the St. Mary's side were among the best players of the year. In services' football Hayden Tanner, the Welsh international scrum half, who captained the Welsh Guards, was outstanding. Late in the year a rousing match between the army and the R.A.F. at Richmond ended in the army's winning by the surprisingly large score of 30 points to 3. Vice-Admiral N. A. Wodehouse, one of England's most famous rugby players, was killed in action during the year. He played for England regularly from 1910–13, and captained the 1912–13 side that beat Scotland, Wales, Ireland and France, the first time this had ever been done. Leeds won the rugby league final, beating Halifax (19–2).

In association football Leslie Compton, the Arsenal player and brother of the famous cricketer, performed an interesting feat. He was chosen to play against Clapton Orient at fullback, later being asked to play at centre half. On the day of the match the manager decided to play him at centre forward, and he scored 10 goals. Many international matches were played, England *v.* Scotland (twice), and England *v.* Wales (twice). England won three out of four, losing to Scotland at Newcastle (3–2), but winning (2–0) at the second meeting at Wembley in October. Stanley Matthews, Stoke City outside right, and E. Hapgood, the Arsenal fullback and England captain, were perhaps the best players of the year. Preston North End was undoubtedly the best English team of 1941, since they won both the league war cup, beating the Arsenal (2–1) after a replay, and the north regional championship. In Scotland the war cup was won by the Rangers, and in Ireland the Irish F.A. cup by Belfast Celtic. (D. R. G.)

Foreign Exchange: *see* EXCHANGE CONTROL AND EXCHANGE RATES.

Foreign Investments in the United States.

Foreign investments in the United States, long- and short-term, were estimated at $9,695,000,000 at the end of 1940. The in-

crease during that year—just over $100,000,000—was considerably less than that of other years. The principal changes that occurred during 1941 were the result of capital movements which were clearly affected by the course of the war. For instance, foreign holdings of the common shares of the U.S. corporations declined in value by about 20%, largely because the British treasury was selling the mobilized investments of British nationals. A decline in the average market price of common stocks was a further factor reducing the value of the common stocks held abroad.

Increased foreign deposits in U.S. banks, which more than offset the decline in foreign investments in common shares, were also traceable to the war. There was not much change in these deposits until April 1940 when the invasion of Denmark and Norway by Germany created widespread concern among neutral European countries. The later attacks on and occupation of Belgium, the Netherlands and France intensified the flow of foreign balances to the United States, and during the latter part of May and during June and July 1940 the inflow was extremely large. A considerable part of this movement was for the account of foreign central banks and governments. In fact, a large part of the gold reserves of European countries was shipped to the United States during 1940 to be held under earmark in that country or to be converted into dollar balances. Later, as some of the countries were invaded by Germany, the United States extended the freezing control, with the result that withdrawals later in 1940 were greatly curtailed, often completely stopped. French deposits were increased greatly in June 1940. A large shipment from the gold reserves of the Bank of France arrived in New York about the time of the Franco-German armistice, and the proceeds were blocked when foreign funds' control was extended to cover the dollar assets of France. The increase in official balances was furthered by the shifting of accounts from private ownership, particularly by Canada and Switzerland.

Although Canada, the United Kingdom and France during the period of its belligerency, were making large purchases of war material in the United States, they did not reduce their balances in American banks to any considerable extent, because their deposit accounts were continually being replenished from the proceeds of the sales of gold.

Imports for the account of the British empire were estimated at $2,800,000,000, and those for France amounted to a further substantial sum. By the utilization of their gold reserves and current production those countries were able to purchase supplies in the U.S. without reducing their working cash dollar balances greatly and without selling earning assets, such as stocks and bonds, until late in 1940.

After the defeat of France, Great Britain took over most of the French commitments or contracts for aeroplanes and other war supplies. The need for dollar balances was very great and, inasmuch as its gold reserves were nearly exhausted, it became necessary to sell the mobilized dollar investments of British nationals. The sales of listed securities were arranged by the special agent of the British treasury, through the syndicates of bankers and brokers. Sales of small blocks were effected on the floor of the exchange but the large blocks were sold by special offering after the close of the exchange trading period. Such sales were made in considerable volume from Oct. 1940 through March 1941.

In the spring of 1941 it became apparent that the British government would have to liquidate some of the so-called British direct investments in the United States. In March it was announced that a banking syndicate had been organized in the U.S. to underwrite the sale to the public of the shares of the American Viscose company. This company, the largest producer of rayon yarns in the United States, was a wholly owned subsidiary of Courtaulds, Ltd. The book value of the Courtauld investment was more than $100,000,000. The amount realized by the British government from the sale of the company was $54,348,923. Further sales of this character were not necessary because the passage of the Lend-Lease bill on March 11, 1941, relieved the British government of the necessity for hurried liquidation of its dollar assets. Additional relief was given by amending the Reconstruction Finance Corporation act (June 10, 1941) to permit loans on the collateral of United States securities. In this manner the United Kingdom was freed of the task of liquidating such a large volume of securities. Under these provisions a loan to the United Kingdom of $425,000,000 was announced by the RFC on July 1, 1941.

Other changes in foreign investments in the United States were of minor importance. As of the end of 1940, United Kingdom investments (long- and short-term) were estimated roughly at $2,400,000,000, Canadian at $1,430,000,000, those of continental Europe at $4,200,000,000, and the rest of the world, $1,665,000,000. A large part of the investments of continental Europe had been subjected to foreign funds control measures when Belgian, Dutch and French dollar assets were included in May and June 1940. Various small countries were added to the list of those affected later in the year and in the spring of 1941. On June 14 the foreign funds control was extended to include all countries of continental Europe, including Switzerland. The order (no. 8389), as amended at that time, provided also for the registration of all foreign assets in the United States. On July 25, 1941, the assets of China and Japan were frozen. The effect of these measures of control was to prevent changes in the investments except under licence from the treasury department.

Foreign funds control, as conceived at the time of the invasion of Scandinavia, Belgium and the Netherlands, was intended primarily to protect the assets of those countries from seizure by Germany. As the world designs of the nazis became clearer in the United States, the control began to be considered as one of the measures of national and hemisphere defense. The actions of June 14 and July 25 in freezing German, Italian and Japanese assets, as well as those of neighbouring states, were frankly aggressive steps against the axis.

There was a continuation of the flow of refugee capital to the United States in 1940, although probably to a lesser extent than in previous years because of more stringent exchange controls abroad. Naturally, such a flow of funds was carefully concealed and its volume not known. This capital took many forms in the United States, namely, bank deposits, holdings of stocks and bonds, real estate and business enterprises. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES.)

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Foreign Investments in the United States by Principal Types, 1938–40

(Year-end data; in millions of dollars)

Type of Investment	1938	1939	1940
Long-term investments:			
Direct investments (book value)	1,895	1,978	2,000
Common stocks (market value)	2,715	2,493	1,947
Preferred stocks (par value)	530	490	450
Bonds (par value)	580	570	570
Miscellaneous investments (capitalized value)	750	750	750
Total long-term investments	6,470	6,290	5,717
Short-term investments	2,231	3,296	3,078
Grand total	8,701	9,586	9,695

Source: Long-term data from International Economics Unit, Bureau of Foreign and Domestic Commerce, Economic Series No. 17, "The Balance of International Payments of the United States in 1940."

Short-term data from the *Bulletin* of the Treasury Department, as adjusted in "The Balance of International Payments of the United States in 1940."

Foreign Missions. During 1941 the wars in Europe and the far east brought increasing problems to Christian foreign missions. In Germany and even in unoccupied France and in Scandinavia, the giving to missions held up remarkably well. However, this money could be sent with difficulty or not at all to those for whom it was intended. In this emergency, Christians in other countries, notably in the United States, came to the rescue. For Protestants, the International Missionary council acted as a transmitting agency. Funds were forthcoming in sufficient amounts to prevent any of the Protestant "orphaned missions"—those cut off from their supporting constituencies—from closing. In the far east the increased tension between Japan on the one hand, and the United States and Great Britain on the other, led to the removal of a very large proportion of the citizens of the latter two powers, including missionaries, from the Japanese empire and the Japanese-occupied parts of China. This particularly affected the Protestant missionary staffs, since these were chiefly from the Anglo-Saxon countries, while the Roman Catholic missionaries were mainly from Germany, Italy and France, with which, through its pact with the axis, Japan was associated.

By the close of 1941 nearly nine-tenths of the Protestant missionaries had withdrawn from Japan and large numbers had come out of occupied China. The governmental freezing of funds made difficult the transmission of money to the missions in the far east. In Japan the union of the Protestant denominations was consummated. All the chief bodies except the Anglicans came into it. The intensification of the war in the near east, especially in Syria, brought embarrassment to the missions in those lands. Yet missionaries, old and new, continued to come from and go to their fields. (K. S. L.)

Foreign Trade: *see* AGRICULTURE; INTERNATIONAL TRADE.

Forests. A single French army corps is said to have used up to 30,000 trees daily in World War I, during which England sacrificed timber in its game preserves and shade trees on the home estates.

In the struggle which began in 1939 there was obvious need for wood for such things as pontoon bridges and railroad ties, crates, ships, cantonments, hospitals. But there was also need for wood and plywood in training planes and for wood charcoal in gas

masks. Glycerol, obtainable from wood, is a source of nitroglycerin. The latter, mixed with sawdust, becomes dynamite. Sawdust, transformed into wood plastics, makes instrument panels, switchboards and hundreds of other articles.

This is only a fragmentary listing of the role forests were playing on the armed front in 1941. On other fronts they were helping to prevent damage by erosion and floods to croplands and cities; to fill rapidly expanding needs for outdoor recreation; to furnish wood and wood products for countless everyday uses; and, through forest-land forage, to produce meat, wool and leather.

Although there probably always will be need for better administration of the national forests, their major contributions to armed and other fronts were made through practices which, besides using the resources, also protect and renew them and improve the power of the land to produce. But destructive cutting and fires on privately owned forest land have been responsible for most of the 80,000,000 acres that are practically devastated, and for additional millions of acres with forests so depleted and inferior that they were in 1941 producing only one-third to one-half as much as they can and should.

This is significant. For the best and most productive three-fourths of all forest land in 1941—from which are obtained about 95% of forest products—was in private rather than public ownership and, although an increasing number of far-sighted leaders adopted better forest practices, about 80% of all privately owned timberland was without conscious care for the perpetuation of its forest resources except for fire protection on part of it.

Destructive cutting, greatly accelerated because of the war, was also unfortunate. For it was unnecessary, even for defense, and it contributed to deplorably unfavourable social and economic conditions—including most of the worst of rural slums—within some 1,250 out of the 3,000 odd counties in the United States.

With these conditions in mind, and because forests should be instruments through which to secure such things as more and better homes and more jobs and more permanent ones for more and more people, the department of agriculture and the forest service included in the program they advocated two measures offering assurances that the U.S. forest problem would be solved.

The first of these measures was nation-wide public regulation of forest practices on privately owned forest land. This would establish standards that are simpler than most of those already adopted by a number of leaders among private owners of forest land but that, as a minimum, would (a) stop further destruction and deterioration of forests generally, and (b) keep all forest lands at least reasonably productive.

The second measure that would give positive assurances was a substantial increase in public ownership by communities, states and the federal government. This should take over forest land submarginal for private ownership and other forest land—like that vital for watershed protection—in which the public interest could not be safeguarded in any other way.

Even with this second measure there was a large part of the forest land in the U.S. (more than half of the best of it, according to current estimates) that would remain in private ownership unless its owners failed to redeem their resource and social obligations. There were in 1941 also many serious and diverse problems that affected most private owners of forest land, and there was a broad but definite public interest in the forest land they owned.

In addition therefore to the two measures, the department and the forest service also advocated various forms of public co-operation designed to help private owners with problems like protection against forest fires and other measures designed to help meet the widespread demand for more and better public services than could be rendered then through the national forest system.

This system included 177,652,648 acres of land, publicly owned or approved for purchase, in 42 states and 2 territories. Like many community and state forests, the national forests were managed on that regulated multiple-use basis designed to build up productivity of land and resources while assuring the greatest combined benefits for the greatest number of people in the long run.

In 1941 the national forests contributed to social and economic security through transactions like the 25,550 sales that involved 1,400,000,000 bd.ft. of timber and the 47,260 permits to graze 6,300,000 head of domestic livestock; and through uses made during the more than 16,000,000 visits by people to improved camp and picnic grounds, winter sports areas, organization camps and resorts.

Contributing more directly to defense, approximately 700,000 acres of national forest land in the U.S. were made available to the war department, and investigations were made and advice given about problems like those involving wood as a substitute for key materials like aluminum, wood for plugs for naval shells and conversion of wood into chemicals and nitrating pulps.

The forest service also detailed experts to train men in aeroplane factories; made arrangements so that 3,200 lookout stations, 63,000 mi. of telephone line and some 3,000 radio stations in the national forests might, if necessary, be used for reporting the approach and movement of hostile aircraft; redesigned a shipping container for bombs, for example, so that it used less wood, weighed less, had greater strength and required less cargo space; and co-operated with many farm and industrial timberland owners to help improve their cutting and forest management practices.

(E. H. CL.)

British Empire.—The efforts of the forest departments throughout the empire were in 1941 mainly concentrated on the war effort. Staff was considerably reduced by the absence of officers and men serving in H.M. forces or in other war duties, such as timber control. The reduced staff had in many cases to deal with increased demands for timber and other forest products, both for the supply to Great Britain and to replace timber previously imported which was unobtainable owing to lack of shipping. Timber control was in force in most of the dominions during 1941.

The necessity of using local supplies of timber undoubtedly led to a better appreciation of indigenous timbers and to the products of exotic plantations, especially in South Africa, Australia and New Zealand. Quite apart from justifying the policy under which the plantations were originated, the increased reliance on these timbers overcame previous prejudices against them and showed that they could be fully justified from a financial point of view.

The lessons of 1914–18 and of World War II showed the necessity for a greater activity in forest management in all forests and of further encouragement, and the institution of some control of privately owned forests. In Great Britain, the leading forestry societies paid special attention to the future of private forests and elaborated plans for better management and control of these forests to be placed before the government for action after the war. In Canada, likewise, the Society of Forest Engineers was framing the lines of a future forest policy to be recommended. Other parts of the empire were also looking to the future and it was generally realized that war must result in a further appreciation of the imperial importance of the forests of the empire. In the colonial empire, the importance of forests in relation to the welfare of the people was being recognized. Not only do they provide the means for improving the standard of living of many of the inhabitants, but they are also essential for the protection of the most fundamental of all resources, the fertility of the land. The Colonial Development and Welfare act should be a powerful aid to placing the conservation of forests in the interests of local inhabitants on a sounder footing.

As far as the greatly denuded staffs were able to deal with other activities in addition to the supply of timber and other products required for the prosecution of the war, the normal work of forest conservation, protection, regeneration and improvement, together with research in all branches, were being carried out as much as possible under the circumstances of total war. (*See* also LUMBER.) (H. R. BD.)

Formosa (TAIWAN), a large island in the western Pacific, separated from China on the west by the Taiwan straits and from the Philippines on the south by the Bashi and Balintang channels. Area, 13,429 sq.mi.; pop. (1938), 5,746,959, of whom 308,845 were Japanese; capital, Taihoku. There were 43,405 aborigines in the mountainous interior of the country; but the majority of the population is of Chinese stock, the island be-

ing acquired by Japan after the war with China in 1894–95. The governor general in 1941 was Admiral Seizo Kobayashi.

Formosa, with its important and jealously guarded naval base at Mako, in the Pescadores, was a valuable base for Japanese naval and air operations against China and, in Dec. 1941, against the neighbouring Philippines.

Trade, Agriculture, Mining, Industries.—Formosa's overseas trade in 1939 was valued at 592,938,000 yen (exports) and 408,650,000 yen (imports). Trade with Japan proper and its territories accounted for 509,745,000 yen of exports and 357,608,000 yen of imports. The Taiwan budget for 1940 was 260,530,226 yen, and the average note issue of the Bank of Taiwan in 1939 was 146,460,000. Formosa's largest articles of export are sugar and rice. The island is one of the world's chief sources of camphor; the fertile coastal plains also produce tea, pineapples and citrus fruits. Sugar output, which had been pretty constant in the neighbourhood of 1,600,000,000 kin (a kin is about 1⅓ U.S. lbs.) from 1935 until 1938, leaped to 2,364,550,976 kin in 1939. Inasmuch as there had been a growing shortage of sugar in Japan, leading to stringent rationing of this product, it seemed to be a reasonable assumption that there was a substantial expansion in the industrial and military uses of the product in 1939–41. There are government monopolies in the sale of opium, camphor, salt, tobacco and sake, the Japanese rice wine. Formosa contains mineral resources, of which gold and coal are the most important, although mining is of secondary importance in the economy of the island. During the decade 1931–41 there was a considerable amount of hydroelectric power development, and spinning and chemical industries were established.

(W. H. Ch.)

Fougner, G. Selmer (1884–1941), U.S. newspaperman and gourmet, familiarly called "the Baron," was born Aug. 24 in Chicago. He developed an interest in gastronomy while he was a student and later a newspaper correspondent in France. When the United States entered World War I in 1917, he returned to the U.S. to serve as publicity agent for the treasury department. In 1933, on the eve of prohibition's repeal, he became the "official gourmet" of the New York *Sun* and wrote a column, "Along the Wine Trail," devoted to helping Americans bridge the abyss from bathtub gin to refined drinking. Intrigued by the romance and history of foods, he founded 14 epicurean societies and enjoyed a wide reputation as a connoisseur among gourmets in the U.S. and on the continent. He died in Washington, D.C., April 2.

Foundations: *see* Donations and Bequests and foundations under their specific names.

Four-H Clubs. All 4-H club members during 1941 participated in the 4-H seven-point program for national defense. Major emphasis was placed on demonstrations in the increased production of food, as well as in the construction of clothing and home equipment for better family living; conservation of human and natural resources on the home farm and in the local community; development of the health of the individual and the community; acquirement of useful technical and mechanical skills; practice in and appreciation of the democratic way of life; development of an understanding of present-day social and economic forces; and the interpretation of the total national defense program to the community. Following the declaration of war a "Victory Program for the 4-H Clubs" was developed providing for more intensive contributions on the part of these rural young people.

Enrolment in the 4-H clubs totalled more than 1,420,000 in 1941, the membership being composed of rural boys and girls ranging in age from 10 to 21 years. Of these, approximately 625,000 were boys and 795,000 girls. The 4-H clubs are conducted by county extension agents co-operatively employed by the state colleges of agriculture, the United States department of agriculture and county governing bodies and local organizations, as a part of the program of co-operative extension work in agriculture and home economics. Assisting in the 4-H club work during 1941 were 154,600 volunteer local leaders, usually local farmers, homemakers and former club members.

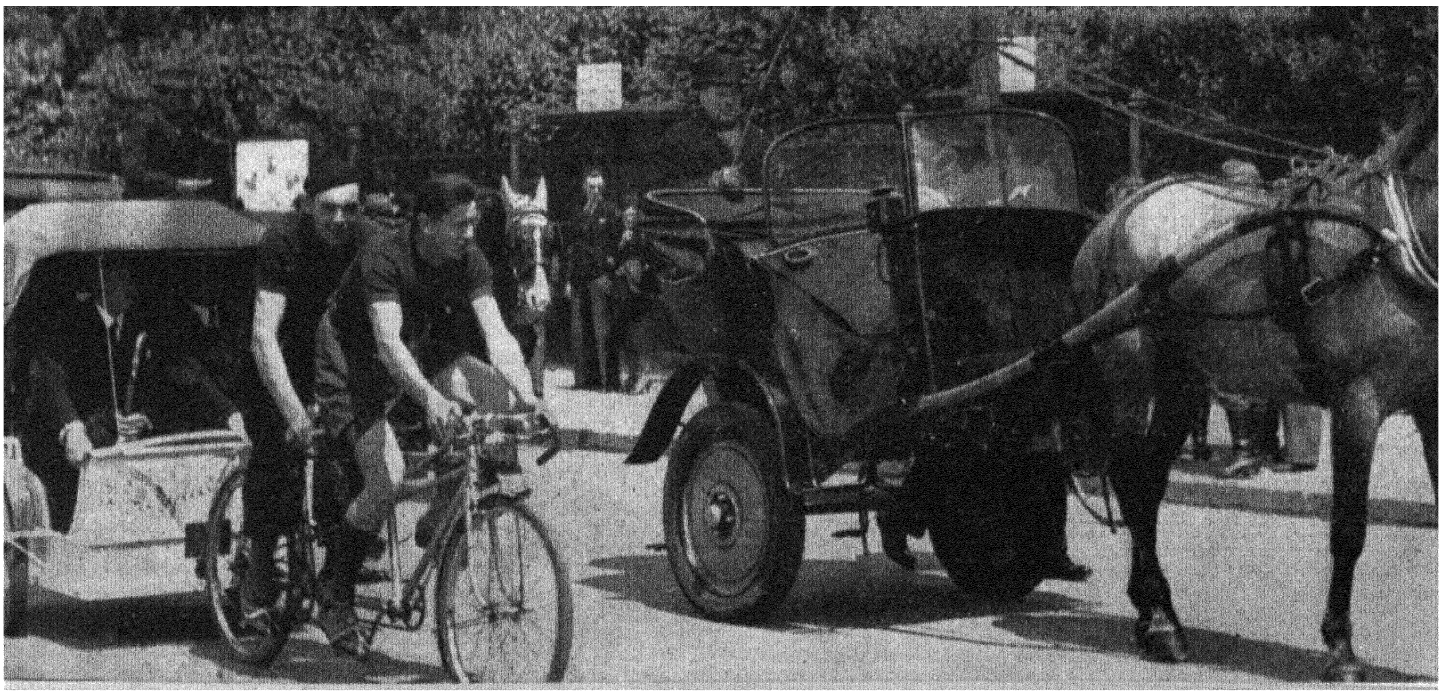
The 4-H clubs are organized on a community basis usually, although in some states they are organized according to the demonstrations conducted by the members. In 1941 there were 79,721 local 4-H clubs, representing practically every county in the 48 states and Alaska, Hawaii and Puerto Rico.

National 4-H club events in 1941 included the National 4-H Club camp held in Washington, D.C., June 18–25; the 4-H division of the National Dairy exposition held at Memphis, Tenn., Oct. 11–18; and the National 4-H Club congress at Chicago, Ill., Nov. 29–Dec. 6.

(M. L. W.)

France. A state situated in the west of Europe; bordered N. by Belgium and Luxembourg, N.E. by Germany, E. by Germany and Switzerland, S.E. by Italy, S. by Spain, with the Mediterranean sea on its southeast coast, the Atlantic ocean on the west, and the English channel and the North sea to the north. Area, 212,736 sq.mi.; pop. (est. April 1, 1941), 39,302,511, exclusive of war prisoners; provisional capital, Vichy; chief of state, Marshal Henri Philippe Pétain (*q.v.*). By the armistice of June 22, 1940, France was divided into two zones, the occupied and the unoccupied (*c.* 85,000 sq.mi.); the line of demarcation is drawn from the Swiss frontier near Geneva to a

RUBBER-TIRED CHAISES and bicycle taxis were fashionable replacements for motor cars during 1941 in occupied France



point 12 mi. east of Tours and thence southwest to the Spanish frontier at St. Jean-Pied-de-Port. Thus, although the Vichy government has theoretical administrative authority over both zones, three-fifths of the country, and that the richer part both agriculturally and industrially, is occupied by the Germans. Language: French; religion: Roman Catholic; *c.* 1,000,000 Protestant.

History.—Throughout 1941 the terms of the Compiègne armistice were the most powerful determining factor in French politics. All intercourse between the occupied and unoccupied zones was rigorously controlled by the Germans, which greatly complicated the efforts of the Vichy government toward reconstruction. Moreover, during 1941 the Germans collected the enormous sum of 122,000,000,000 francs for costs of occupation, a sum equivalent to about $3,050,000,000. In May the costs were reduced from the rate of 400,000,000 to 300,000,000 francs a day. Inasmuch as unofficial estimates place the actual costs of occupation at no more than 125,000,000 francs a day, part of the surplus was used by the Germans, it is alleged, to purchase an interest in, and (in some cases) outright control of, French businesses. In addition, the German government had, according to the official statement of the Bank of France of Oct. 23, an unused credit of 63,423,000,000 francs; by Oct. 31 the Bank of France had advanced to the French government a total of 129,000,000,000 francs for occupation costs.

On July 2, 1941 it was officially announced that the total number of French war prisoners had been 1,800,000; by the end of the year, according to official Vichy figures, 1,426,422 still remained in German custody.

Though in his famous interview with Hitler at Montoire on Oct. 24, 1940, Pétain accepted the principle of "collaboration," from then, throughout 1941, events revolved around the differences between the French and the German interpretations of that extremely ambiguous word. By his dismissal of the ardent "collaborationist," Pierre Laval (*q.v.*) Dec. 13, 1940, Pétain precipitated a protracted crisis with Germany. On Dec. 24, 1940, minister of the navy, Admiral Darlan (*q.v.*) had presented to Hitler Pétain's explanation of Laval's disgrace. No German reply was received for several weeks. On Jan. 19 Pétain and Laval had an inconclusive conversation at La Ferté-Hauterive. On Jan. 27 constitutional act no. VII was published. It required ministers and other high officials to take an oath of loyalty to Pétain personally, and gave him the retroactive authority to punish any official for misdeeds committed from 1932–41. The marshal was also empowered to banish or imprison ministers on his own authority.

On Feb. 8 Laval declined an offer to be minister of state. This refusal paved the way for the rise to power of Darlan, an equally ardent "collaborationist." On Feb. 9 Darlan became foreign minister (succeeding Pierre Etienne Flandin), and director of the information service, while remaining also minister of the navy. By constitutional act no. VIII, issued Feb. 11, he was named vice-premier, and Pétain's eventual successor, and was also appointed vice-president of the council of ministers. On Feb. 24 he added to his other portfolios that of the ministry of the interior, and in the quarterly budget, published April 3, an extra 265,000,000 francs was allotted to that ministry for secret police. In a broadcast of April 7 Pétain emphasized that "Admiral Darlan enjoys my complete confidence." On May 6 a decree stipulated that in all large cities the police would thenceforth be national, under the jurisdiction of the minister of the interior. Darlan relinquished the ministry of the interior on July 18, but his successor, Pierre Pucheu, was a trusted Darlan henchman. On Aug. 12 Darlan became defense minister, in addition to his other offices, with supreme command in matters of defense over the army, navy, aviation and the colonies. In this way Gen. Maxime Weygand (*q.v.*), delegate general of the French government in Africa, was subordinated to Darlan's orders. Finally, following the death in an air crash on Nov. 12 of Gen. Charles Huntziger (*q.v.*), minister of war, Darlan became temporary minister of that department, a post which he still held as the year ended. He is alleged to have been industrious in "purging" officials upon whose allegiance he could not implicitly rely.

FRENCH MANIKINS paraded new styles at Auteuil, near Paris, in July 1941—as they did in the years before France's defeat

Admiral Darlan is an Anglophobe, principally because of the British attack upon the French fleet at Oran in July 1940. On March 10 he called the British blockade "imbecile," and declared that the Germans, who had given 2,000,000 quintals of wheat, were more generous than the British. Two weeks later it leaked out that the German "gift" was in reality only a part of a barter agreement. The public possession of this news moderated Darlan's ire, as well as the agitation in the U.S. for supplying foodstuffs to France.

During 1941, as in 1940, Vichy France experienced great difficulty in holding its empire together. On Jan. 23 Japanese mediation was accepted in the four-months-old undeclared war between Thailand and French Indo-China, and on March 11 an agreement was initialled at Tokyo which ceded some important border districts to Thailand. This peace, which also included an economic agreement with Japan, became definitive on May 9. In July the Japanese exerted great pressure for further concessions in French Indo-China, and on July 21 the Vichy government acceded to the Japanese demands, the military clauses of which evidently allowed large Japanese garrisons in eight new bases in the southern part of Indo-China and Japanese use of the naval base at Cam Ranh bay. In addition, beginning in June, the British and Free French kept French Somaliland in a state of blockade, with precarious communications open only by air.

Late April and early May marked the high point of "collaboration" in 1941, as a result of which it seemed for a time that

France might join the axis. The League of Nations was informed on April 19 of France's withdrawal. On May 11 Darlan had an interview with Hitler at Berchtesgaden. There were persistent rumours, soon proved to be true, that German airmen were using Syrian airfields en route to Iraq. On May 15 Pres. Roosevelt voiced his concern over the policy of "collaboration," and on the same day U.S. coast guards began to guard the French vessels, including the "Normandie," laid up in U.S. ports. Admiral Darlan was evidently convinced that the Germans would win the war, and on May 23, in a radio broadcast, he praised the policy of "collaboration" and Hitler's "new order," although he declared that France would not give up its colonies or its fleet. On May 28 Pétain reviewed recommissioned French planes at Aulnat, and it was understood that the Germans were permitting the French to send planes to Tunisia and Syria, which constituted a modification of the armistice terms.

This threatening international crisis died down because the Germans chose not to figure prominently in the Syrian campaign against the British and the Free French. Moreover, Gen. Weygand, who visited Vichy on June 2, is said to have disagreed sharply with Darlan about letting the Germans use military facilities in Syria. In the meantime the British and Free French invaded Syria on June 8; the Vichy French, under the command of High Commissioner Gen. Henri Fernand Dentz (*q.v.*), were unable to obtain sufficient re-enforcements for a long campaign, and, after severe fighting, an armistice was initialled at Acre on July 12. The occupying authorities permitted all Frenchmen in Syria to opt for repatriation, if they chose. Officially, the Vichy government did not recognize that it had voided any of its rights in this mandated territory, and Gen. Dentz, who was repatriated, still bore the official title of high commissioner at the end of 1941.

On June 30 the Vichy government broke off diplomatic relations with the U.S.S.R., and later tolerated, in the unoccupied zone, recruiting for the Legion of French Volunteers Against Bolshevism. War on the soviet union was not, however, declared in 1941, and it was particularly remarkable that France was not a signatory to the renewed and expanded anti-Comintern pact which was signed with much fanfare at Berlin on Nov. 25.

The title of "French Republic" was dropped from the masthead of the *Journal Officiel* on Jan. 4, 1941, and Pétain, throughout the year groped tentatively toward the "hierarchical and authoritarian" state he announced as his goal on June 4. The reorganization, in conformity with the slogan "Work, Family, Fatherland," proceeded slowly and piecemeal, partly because of financial and administrative difficulties, partly (it may be suspected) because of covert opposition and resistance. On Jan. 24 Pétain announced the membership of a consultative national council, composed of 188 members, of whom only 27 were former senators and 41 former deputies. On March 14 old-age pensions were announced, and on April 9 it was decreed that no divorce might be obtained within three years of the date of marriage. On April 18 a long-range plan was announced for grouping the infinitesimal landstrips of peasants into unified and more arable holdings, with the ultimate intention of persuading peasants to leave the villages and live on farmsteads. The government contemplated dividing the country into regional administrative units, controlling but not completely superseding the departments. A beginning was made in the free zone on April 12, "to improve the distribution of supplies." At Vichy on July 8 Pétain opened the sessions of that commission of the national council whose function it was to prepare a constitution for "an authoritarian, hierarchical, social state." He instructed the commission to make universal suffrage give place to a form of hierarchical group representation. By Oct. 23 the commission had finished its work, but its recommendations had not been published at the end of the year.

PARISIAN BREADLINES grew longer in 1941

The government was also moving slowly toward reorganizing the nation's economy along corporative lines in 1941. An elaborate banking law of July 6 put all French banks under the direction of a "professional committee." On Oct. 27 the long-awaited Labour Charter was published. Lock-outs and strikes were prohibited; although labour unions were not abolished, they were to be restricted within a single profession or industry, and no political or confessional activity was to be permitted.

Marshal Pétain in his broadcast of Aug. 12 took cognizance of the growing discontent and unrest by admitting that "an ill wind was blowing over France," and reminded his people that "the only authority is that which I entrust or delegate." The repercussions of the German campaign in the U.S.S.R. were partly the cause of this unrest, as was also the sensation aroused by the assassination on July 26 at Montelimar of Marx Dormoy, who had been minister of the interior in Leon Blum's Popular Front government. The perpetrators of this crime were not certainly identified to the public. The populace is said also to have been restive over the concessions to the Japanese in Indo-China, while in early August there was once again heavy German pressure for more "collaboration." In his broadcast of Aug. 12, Pétain announced that salaries for senators and deputies would be discontinued on Sept. 30 (this date was subsequently extended to June 2, 1942); that Freemasons would no longer be permitted to exercise public functions; and that the French Legion of War Veterans was to be expanded, apparently in order to form party backing for the Pétain regime. On Aug. 16 was published constitutional act no. IX, which required the army and all magistrates to take an oath of fealty to the chief of state. On Aug. 31, Pétain announced that membership in the French legion would thenceforth be extended to all who were ready to "volunteer their services for the National Revolution," and to the legion was accorded the privilege of claiming for its members two-thirds of any newly created governmental posts. The legion, which was said to number 1,200,000 in 1941, was not, however, authorized in the occupied zone.

Widespread sabotage, and even riots and attacks upon German soldiers, began to occur in the occupied zone in August. On Aug. 23 the Vichy government created special courts to deal summarily with terrorists and saboteurs, in order to prove to the Germans that the French were able to handle the situation them-

selves. On Aug. 27 Pierre Laval and Marcel Déat, the latter a leading "collaborationist" journalist, were wounded while attending a review at Versailles of the Legion of French Volunteers Against Bolshevism. On Oct. 20 Lieut.-Col. Paul Friedrich Hotz was assassinated at Nantes, and the next day Major Hans Gottfried Reimers was killed at Bordeaux. In retaliation, the Germans shot 50 hostages on Oct. 22, and another 50 on Oct. 24. It is said that Pétain desired to offer himself as a hostage; certainly both he and also Gen. de Gaulle (*q.v.*) appealed to the French to abstain from further attacks. Sabotage and attacks flared up again in late November and sporadically throughout December. There were several bomb explosions in Paris, and the Germans announced on Dec. 13 that another 100 hostages had been shot, although it is not certain that these executions really occurred. At all events, the French government on Dec. 14 officially protested against these hostage-killings. The official count of Frenchmen known to be executed by the Germans up to Dec. 13 was 205.

A "collaboration" crisis in November was marked by the retirement of Weygand on Nov. 20. This crisis was climaxed by the meetings of Pétain with Goering at Saint-Florentin on Dec. 1, and of Darlan with Ciano at Turin on Dec. 9–10, but the consequences of these conferences had not become apparent as the year came to an end.

The immediate effect of the entry of the U.S. into the war seems to have been to render both Vichy and Washington cautious about taking brash action—so much so that as the year came to a close still another Franco-German crisis over "collaboration" was clearly impending.

U.S. Ambassador Admiral W. D. Leahy, who arrived in Vichy on Jan. 6, 1941, evidently endeavoured constantly to encourage the government to resist complete "collaboration." On Dec. 12 the U.S. took possession of the 14 French vessels, including the "Normandie," which were laid up in U.S. harbours, an act which French Ambassador Henry-Haye formally protested. On Dec. 19 it was announced in Washington that a naval agreement had been signed by U.S. Admiral Frederick J. Horne and High Commissioner Admiral Georges Robert, whereby the continuation of Vichy control in Martinique and Guadeloupe was guaranteed in return for a renewed pledge that those islands would remain neutral. On Dec. 25 the U.S. state department vigorously protested against the Free French seizure of St. Pierre and Miquelon.

The trial of the "war-guilt" prisoners, Daladier, Gamelin and Blum, was from time to time postponed, and as the year ended a date in late Feb. 1942 was being mentioned.

Education.—Emphasis was put upon religious instruction. On Feb. 26, 1941, a law was decreed requiring all schools to provide this instruction, although it was to be optional for the students. State funds were created for church schools, which in return were to be subject to some limited and strictly defined state inspection. Training colleges for teachers were abolished. On Feb. 8 it was decreed that all French youths must serve for eight months in work camps upon reaching military age. Tuition fees were established for all secondary schools, albeit with the provision of liberal scholarships.

Finance.—The budget for 1941 called for ordinary expenditures of 97,000,000,000 francs, plus extraordinary ones (for public works and the liquidation of war costs) of 37,234,000,000 francs. The estimated receipts were 68,200,000,000 francs, leaving a deficit (exclusive of the costs of occupation) of 66,000,000,000 francs. Some savings were made by the conversion of bond issues, for the outstanding financial feature of the year was the abundance of funds available for investment, because of the disruption of industrial conditions and the consequent decline in rates of interest.

In 1940 temporary economic accords and clearing agreements were concluded with Germany and Switzerland. Similar agreements were concluded with Belgium on Jan. 11, 1941, with the Netherlands on Feb. 15, with Italy on Feb. 18 and with Norway on Nov. 11. Such agreements were also discussed with Hungary, Rumania and Spain. Most of these financial arrangements are tied to the German mark and cleared through Germany.

Communication.—Some progress had been made by the end of 1941 in construction and reconstruction. Almost all the damaged railroad lines and canals had been repaired. On March 15, the construction of the Trans-Saharan railroad was authorized, and on Sept. 5 there was appropriated 128,000,000 francs for this purpose, as well as for the defense of Dakar and the construction of harbour works at Abidjan (Ivory Coast).

Economic Conditions.—Unemployment, which stood at 700,000 in Jan. 1941, was only 235,000 in September, although this problem would be greatly aggravated if and when French war prisoners were released. On July 23 many French industries began operating on a 48-hour week, instead of the former 40-hour week. Probably as many as 100,000 French workers had accepted jobs in Germany, and many French industries were undoubtedly being supplied with raw materials by the Germans for the production of German war supplies, notably tanks, planes and parachutes. The government was trying hard to keep down the rising cost of living and to avoid disastrous inflation. A subsidy of 1,500,000,000 francs was allotted in 1941 to reduce the cost of bread, and this sum was doubled for 1942.

The greatest problem was that of supplies and their distribution. Adequate transportation was an almost insoluble problem because of shortages of rolling stock, lubricants and fuel. Production of coal in 1941 was officially estimated at 2,800,000 tons, compared with 4,500,000 in 1940. In order to conserve fuel, a shutdown of all but the most essential industries from Dec. 21, 1941, to Jan. 14, 1942, was decreed. Shortages of food were universal, and the results of undernourishment were already clearly discernible. Crops were below average in 1941, and the yield of wine was particularly poor.

Various steps were taken to reduce the consumption of alcoholic beverages, and the government also made extraordinary efforts, with only partial success, to prevent food profiteering in the "black markets," and to secure an equable division, through elaborate price fixing, of the scanty supply of fuel and foodstuffs. The increase of bureaucratic regulations was noteworthy in 1941, and it is said that in the eight months preceding July 12, 1941, Pétain signed 700 laws and 500 decrees. (*See* also ANTI-SEMITISM; FRENCH COLONIAL EMPIRE; WORLD WAR II.) (A. M. WN.)

France, Free: *see* FRENCH COLONIAL EMPIRE.

Franco, Francisco (1892–), Spanish soldier and statesman, was born in Galicia. After military service in Morocco, he became a colonel in 1926, and served under the Spanish republic of 1931 in the Balearic Islands, being later transferred to Morocco again. In 1935, he was made chief of staff. On the outbreak of the civil war in June 1936, he flew to Tetuan, in Spanish Morocco, and there organized the transport of Foreign Legionaries and Moorish troops to the Spanish mainland, whither he soon followed. Upon the death of Gen. Sanjurjo, Gen. Franco became military leader of the insurgents. After his victorious conclusion of the civil war in 1939 he added the title of prime minister to the others he possessed, organized his cabinet, and began the task of reconstruction. Franco issued a declaration of "strictest neutrality" at the outset of war in Sept. 1939, but the possibility of Spain's entry into the conflict after the French defeat was the cause for much speculation during the last half of 1940 and throughout 1941. His conference of Feb. 12, 1941, with Mussolini at Bordighera produced nothing tangible except the usual expression of "identity of views on all points." Internal problems continued to dog the *caudillo* throughout 1941. On May 9 there was a general shake-up in the government and the national police chief was ousted; later that month Franco delegated to the Falange (fascist) party complete control over the Spanish press. The problem of food remained acute, and Franco saw fit on July 17 to denounce the United States for refusing to ship grain to Spain. In August a report from Berne stated that an unsuccessful attempt had been made to assassinate Franco. At the end of the year Spain was still in the ever-diminishing neutral camp, Franco having signed a decree on Dec. 19 which proclaimed Spain's nonbelligerent status in the Pacific war. (*See* also SPAIN.)

Frazer, Sir James George (1854–1941), British anthropologist and author of *The Golden Bough*, was born Jan. 1 at Glasgow. He was recognized as one of the world's foremost authorities on folklore. (See *Encyclopædia Britannica.*)

His last work, published in four volumes, was *Anthologia Anthropologica, a Selection of Passages for the Study of Social Anthropology* (1938–39), and comprised studies on Africa, Madagascar, Australasia, Asia, Europe and America. Among his other late works were: *Myths of the Origin of Fire* (1930); *Garnered Sheaves* (1931); *The Fear of the Dead in Primitive Religion*, 3 vols. (1933–36) and *Aftermath* (1936). With his wife, the

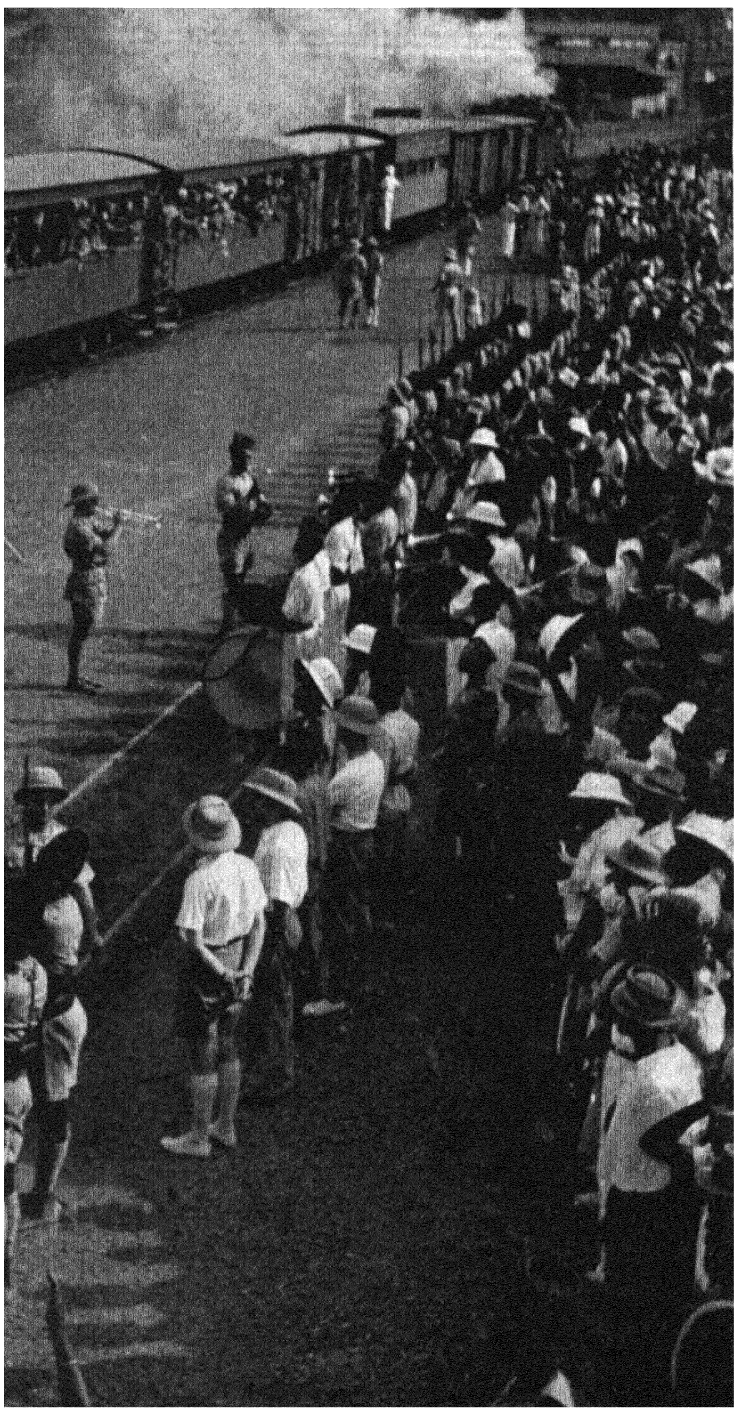
former Mrs. Lilly Grove, he wrote several children's books, including *Pasha the Pom* (1937). Sir James died in Cambridge, England, May 7; Lady Frazer died 12 hours later.

Free France: *see* FRENCH COLONIAL EMPIRE.
Freemasonry: *see* MASONIC ORDER.
Freer Gallery of Art: *see* SMITHSONIAN INSTITUTION.

French Colonial Empire.

Total area (approx.) 4,657,000 sq.mi.; total pop. (est. Dec. 31, 1937) 70,147,000. Certain essential information on the French colonies, protectorates and mandates is given in the accompanying table.

History.—On Jan. 6, 1941, the public was informed of the letter by which the British government recognized the Council of Defense of the French empire established by two decrees of General Charles de Gaulle (*q.v.*), issued at Brazzaville Oct. 27, 1940. In that letter the British government informed General de Gaulle that it would be happy to treat with him and with the Council of Defense on all military, political and economic questions involving collaboration with the French overseas territories under the authority of General de Gaulle. Several commercial and financial agreements were subsequently signed by the British government and General de Gaulle as leader of the Free French and on behalf of the Council of Defense of the French empire. As a result of these agreements the Free French colonies were being restored to their former prosperity. The colonial budgets were again balanced, and provision was made for their contribution to the war effort. Credits were also granted for extensive public works.



PART OF THESE AFRICAN TROOPS shown leaving Duala in the Cameroons formed the Free French army which stormed into southern Libya and captured the Italian garrison of Murzuk in Jan. 1941

The first Free French airline began operations in Oct. 1941, linking Brazzaville to Cairo and Syria. One of the most powerful broadcasting stations in the world was set up in Free French Africa. The Cadets' school at the Camp Colonna d'Ornano, inaugurated Feb. 23, 1941, was often referred to as the "Saint Cyr" of the Free French empire. Research on sleeping sickness was carried on at the Institut Pasteur in Brazzaville.

Relations were also systematically developed between the Free French colonies and the United States of America. Chrome, nickel, lead, tin and rutile were exported to U.S. factories engaged in war work. An open general licence was granted for U.S. exports to the Free French colonies. A U.S. mission headed by Col. Cunningham was sent to Free French Africa, and the United States government appointed consuls in Nouméa and Tahiti.

During 1941, several changes took place in the administration of the Free French empire. In the national committee set up by General de Gaulle on Sept. 24, colonial questions were delegated to the commissariat for economy, finance and the colonies. General Sicé was appointed high commissioner for Free French Africa in August, replacing General de Larminat, who was nominated assistant to the commander in chief in the Levant, General Catroux. Post-Captain Thierry d'Argenlieu was appointed French high commissioner for the Pacific in July, and was given the task of making military preparations in order to counter any move made by Japan in that direction.

As to French Indo-China, which still owed allegiance to the Vichy government, it had been unable to prevent Japan from gaining a strong foothold there—a foothold the Japs used to launch their attack on Malaya in December. Thailand's aggressive move against Cambodia at the end of 1940 had the moral support of Japan, which acted as mediator during the long and difficult negotiations resulting in the peace treaty signed May 9. At the same time, on May 6, French Indo-China, which had experienced a regime of customs autonomy since the end of 1940, entered into an agreement of economic co-operation with Japan, which thus acquired an overwhelming influence in the economic life of the colony. On July 29, the French government was forced to sign a protocol providing for the joint defense with Japan of Indo-China. This gave Japan the right to use certain airfields and station troops in French Indo-China, thus facilitating attacks, after the surrender of Thailand, on Burma and Malaya, as well as south China and the strategic Burma road.

Certain portions of the French colonial empire still adhering to the Vichy government in 1941 were able to obtain food supplies under agreements signed with the United States. By terms of these agreements a fixed amount of the French treasury credits in the United States was unfrozen and paid into a special account, which was supervised by the U.S. treasury. It was thus impossible to divert the funds from the appropriation previously agreed upon between the treasury and the French representatives. Each colony coming under this scheme, *e.g.*, the French West Indies, Madagascar, and French Indo-China, was allowed a certain

French Colonial Empire

Country and Area sq. miles (approx.)	Population (est. Dec. 31, 1938) (000's omitted)	Capital, Status, Governors, Premiers, etc.
I.—ALLIED TO THE FREE FRENCH MOVEMENT IN 1941		
AFRICA		
French Equatorial Africa, 867,700. . .	3,500	Brazzaville, *High Commissioner for Free French Africa:* Médecin-Général Sicé. Brazzaville, *Governor-General:* M. Eboué.
Gabon, 106,500. . .	410*	Libreville, colony, *Governor:* M. Valentin-Smith.
Middle Congo, 150,700	747*	Brazzaville, colony, *Administrator:* M. Fortuné.
Oubangui-Chari, 214,600	834*	Bangui, colony, *Governor:* M. de St.-Mart.
Chad, 386,900 . . .	1,432*	Fort Lamy, colony, *Governor:* M. Lapie.
Cameroons, 161,200 .	2,400	Yaoundé, mandated territory, *Governor:* M. Cournarie.
AMERICA		
St. Pierre and Miquelon, 93	4	St. Pierre, colony, *Administrator:* M. de Bournat.
ASIA		
French India, 190 . .	330	Pondicherry, colony, *Governor:* M. Bonvin.
†Syria and Lebanon, 77,700	3,600	Damascus, mandated territory, military occupation, *Commander-in-Chief:* General Catroux.
OCEANIA		Nouméa, *High Commissioner for the Pacific:* Capitaine de Vaisseau Thierry D'Argenlieu.
New Caledonia and Dependencies, 7,310	55	Nouméa, colony, *Governor:* M. Sautot.
New Hebrides, 5,700 .	50	Vila, condominium, *Resident-Commissioner:* M. Kuter.
Pacific Islands, including Society Is., Tuamotu Is., Tubuai Archipelagos, etc. 1,540	45	Papeete, colony, *Governor:* Lieutenant-Colonel Orselli.
II.—ADHERING TO THE VICHY GOVERNMENT IN 1941		
AFRICA		*Permanent Secretary-General for French Africa:* Vice-Admiral Fénard.
Algeria, 845,400 . . .	7,490	Algiers, colony under jurisdiction of the Minister of the Interior, *Governor-General:* M. Chatel.
Morocco (F.), 165,800	6,500	Rabat, protectorate, under the Minister of Foreign Affairs, *Sultan:* Sidi Mohammed, *Resident-General:* General Nogues.
Tunisia, 48,800 . . .	2,700	Tunis, protectorate, under the Minister of Foreign Affairs, *Bey:* Sidi Ahmed. *Resident-General:* Admiral Esteva.
French West Africa, 1,807,700.	14,800	Dakar, *Governor-General:* M. Boisson.
Senegal, 77,000 . .	1,790*	St. Louis, colony, *Governor:* M. Rey.
Mauritania, 330,000	383*	St. Louis, colony, *Governor:* M. Beyriès.
French Guinea, 97,000	2,011*	Conakry, colony, *Governor:* M. Giacobbi.
Ivory Coast, 183,000	3,851*	Abidjan, colony, *Governor:* M. Deschamps.
Dahomey, 43,000 . .	1,352*	Porto Novo, colony, *Governor:* M. Truitard.
French Sudan, 577,000	3,569*	Koulouba (Bamako), colony, *Governor:* M. Desanti.
Niger, 500,000 . . .	1,747*	Niamey, colony, *Governor:* M. Falvy.
Togoland, 20,000. . .	781	Lomé, mandated territory, *Administrator-Superior:* M. Delpech.
French Somaliland, 8,380	50	Jibuti, colony, *Governor:* M. Nouailhetas.
Madagascar and Dependencies, 236,900	3,900	Antananarivo, colony, *Governor-General:* M. Annet.
Réunion, 920	210	St. Denis, colony, *Governor:* M. Aubert.
AMERICA		
French Guiana, including Inini, 34,740 . .	37	Cayenne, colony, *Governor:* M. Chot-Plassot.
Guadeloupe, 690 . . .	310	Basse-Terre, colony, *Governor:* M. Sorin.
Martinique, 386 . . .	255	Fort-de-France, colony, *Governor:* M. Nicolle.
ASIA		
French Indo-China, 283,000	23,500	Saigon, *Governor-General:* Admiral Decoux.
Annam, 55,800 . . .	5,656	Hué, protectorate, *Resident-Superior:* M. Graffeuil.
Cambodia, 69,200. .	3,046*	Pnom-Penh, protectorate, *Resident-Superior:* M. Thibaudeau.
Cochin-China, 25,400	4,616*	Saigon, colony, *Governor:* M. Veber.
Laos, 88,800	1,012*	Vientiane, protectorate.
Tongking 43,800 . .	8,700*	Hanoi, protectorate, *Resident-Superior:* M. Châtel.
Kwangchow Wan, 310	250	Fort Bayard, territory (leased from China), *Administrator:* M. Le Prévot.

*Population 1936 census.
†Syria and Lebanon were recognized by Great Britain and Free France as independent republics in Sept. and Nov. 1941 (*see* Syria and Lebanon).

quota. The funds were used in payment of purchases made in the United States or elsewhere in the western hemisphere. The goods so imported could not be re-exported either to France or to another colony.

French North Africa was originally the subject of a similar scheme, the execution of which depended upon navicerts issued by Great Britain. After the dismissal of General Maxime Weygand (*q.v.*) as delegate of the French government in French North Africa in Nov. 1941, however, the United States government ceased to send supplies to French North Africa. (*See* also Syria and Lebanon; World War II.) (X.)

French Colonies in America.—In 1941 the political position of the four colonies continued unchanged until December. In the first 11 months, attention was focused mainly on Martinique and, to a less extent, on French Guiana, especially after arrival of United States troops in adjacent Surinam. (See Surinam.) French naval units were kept under close surveillance by United States naval and air patrols. Both Martinique and Guadeloupe remained under semiblockade, with most of their external trade confined to the United States. On several occasions during the year, as the Vichy government seemed to turn more toward the axis, official and semiofficial statements were made in the United States regarding possible United States occupation of Martinique. With formal entry of the United States into World War II, fears that Martinique would become an axis base against the Americas were heightened. On Dec. 18, however, it was officially announced at Washington that an accord had been reached with Admiral Georges Robert, high commissioner for the French colonies in the western hemisphere. This agreement, it was understood, provided for continued trade with the United States in return for pledges that neither French vessels nor nationals would take any action detrimental to the United States. The Vichy government, however, denied any change in the status of the French American colonies. French Guiana reputedly was serving as an entrepôt for axis agents into South America in 1941.

The most critical international crisis, however, developed at St. Pierre and Miquelon. Throughout the year, the Vichy-appointed governor of that colony was harassed by intermittent undercover Free French agitation. On the night of Dec. 24, a Free French armed vessel seized St. Pierre. This move brought swift condemnation from the United States as a violation of agreements with the Vichy government, and a formal demand for restoration of the *status quo ante,* in spite of a plebiscite which showed an overwhelming Free French sentiment. As the year ended, a *modus vivendi* was reported in the making, under which Vichy control would be restored, with, however, a close supervision of the St. Pierre radio station (established under the Vichy government), whose weather reports were calculated to give aid to the enemy.

Finance.—The monetary unit is the French franc (=2.083 cents, Jan.–June 1940).

Trade.—In 1940 total St. Pierre and Miquelon imports were 28,614,000 fr. in value (1939, 28,735,000 fr.); exports, 16,475,000 fr. (1939, 18,010,000 fr.). Ship stores represented 72.9% of all exports (1939, 43.8%). After the collapse of France, the United States and Canada supplied nearly all imports. The former furnished $124,600 value in 1940 (1939, $141,980), and took $57,920 of exports (1939, $93,723). Imports of all the colonies are chiefly foodstuffs and miscellaneous manufactured goods. In 1940 Guadeloupe and Martinique together imported from the United States $2,221,698 in value (54% increase), and exported $175,749 (a 10% rise); French Guiana took $196,411, a 116% increase, and exported $26,541 value (a 25.4% decline). In the first eight months of 1941 Guadeloupe and Martinique imports from the United States increased 158% over 1940, to $3,223,401, and exports rose 207% to $224,345. French Guiana imports from the United States increased 49% to $114,894; exports remained stationary at $20,779. The unbalance of trade was settled from French funds "frozen" in the United States.

Communications.—Normally, the French American colonies have adequate external communication by sea. Guadeloupe, Martinique and French Guiana are on main Pan American Airways routes. Guadeloupe and Martinique have adequate highway systems. French Guiana has 250 km. of highway and 12 km. of railway, but in the interior, transport services are primitive.

Resources.—St. Pierre and Miquelon depend entirely on fishing, Guadeloupe and Martinique on agriculture (sugar especially, and bananas, with coffee and cacao in Guadeloupe), French Guiana on gold mining, cabinet woods and miscellaneous products of tropical agriculture. Martinique and Guadeloupe produce from 55,000 to 60,000 tons of sugar and 16,000,000 litres of rum annually. (L. W. Bz.)

French Congo: *see* FRENCH COLONIAL EMPIRE.
French Equatorial Africa: *see* FRENCH COLONIAL EMPIRE.
French Guiana: *see* FRENCH COLONIAL EMPIRE.
French Guinea: *see* FRENCH COLONIAL EMPIRE.
French Indo-China: *see* CHINESE-JAPANESE WAR; FRANCE; FRENCH COLONIAL EMPIRE; JAPAN; THAILAND; WORLD WAR II.

French Literature.

After the nazi invasion of June 1940, literary activity in France was paralyzed, and it was only in 1941 that the creative forces began to revive. The fact that the country was split in two, and also that the free elements rallied around Gen. de Gaulle (*q.v.*) dominated the general picture.

In metropolitan France, literature marked a more or less sterile period. Paris publishers brought out only such works as met favour with the "collaborationist" dicta, and even in the so-called "free zone"—in Lyons, Marseilles, Clermont-Ferrand—where the occupying control was less oppressive, the official adherence to "collaboration" with the invader did not fail to shackle both writers and publishers. Certain younger poets and littérateurs issued their works in French North Africa, principally in Algiers. For the first time in France's long, brilliant history many of its important new literary works came from the French Diaspora. A new and vital phase began, one in which exiled writers, editors and publishers brought out significant creations from the strongholds of the democracies: London, New York, Montreal, Buenos Aires, Rio de Janeiro.

Many of the great Paris publishing houses resumed business, although, of course, under the restrictions imposed by nazi regime. The famous house of Gallimard (*Editions de la Nouvelle Revue Française*) was entirely in the hands of nazi sympathizers. Marcel Jouhandeau, who announced himself before the war as a militant anti-Semite, published in 1941 *L'Arbre de Visages, Chaminadour III.* Other books published by this house included: *Vie d'Alphonse Daudet,* by Lucien Daudet; *Iles de Beauté,* by Alain Gerbault; *L'Année Cruciale (1789),* by Frédéric Braesch; *Les Causes Perdues,* by V. Tréfusis; *Vie de Mallarmé,* by Henri Mondor; *Rayonnement de Lyautey,* by Patrick Heidsick. Bernard Grasset, another convert to the cause of the invader, returned to Paris to reorganize his publishing house. He issued novels by Henry de Montherlant, François Mauriac and others. The house of Stock carried on with such books as *Sur Une Terre Menacée,* by Marcel Arland; *Les Contes de Poindi,* by Jean Mariotti; *Le Grand Passage,* translated from the English of Kenneth Roberts. The house of Plon published in 1941 *La Légion des Vivants,* a novel of the far east, translated from the English of O. P. Gilbert. Denoël brought out *Histoire de la Maison de Savoie,* by Fernand Hayward; and the *Editions de France* published *La Cantinère de Napoléon,* by Robert Burnand. From the *Presses Universitaires de France* came *La Mort et Ses Problèmes* by Henri Bon.

Louis-Ferdinand Céline, who gained notoriety with his *Voyage au Bout de la Nuit,* a few years before, appeared with a new volume, *Les Beaux Draps,* in which his anti-Semitism is only equalled in violence and ordure by his hatred of his country's effort. Georges Duhamel, in Paris, had his new novel *Lieux d'Asile* banned, at the moment of publication, by the Paris gestapo.

The treachery and hypocrisy of the Germanophile spirit in Paris was only too manifest. The well-known monthly, *Nouvelle Revue Française,* which flourished under the liberal editorship of Jean Paulhan before the war, was in 1941 in the hands of a nazi sympathizer, the poet and novelist, Drieu la Rochelle. André Gide, the original founder of the magazine, withdrew, after an excerpt from his diary was published without his permission. The chief collaborators were: Marcel Jouhandeau and Robert Brasillac. Brasillac, taken prisoner in the surrender of June 1940, was released by the Germans and was in 1941 an active "collaborationist." Another militant pro-nazi in 1941 was Jean Luchaire, whose *Nouveaux Temps* was reaping the fruit of prewar Hitlerite activities.

More reassuring was the news that Adrienne Monnier, publisher of the French version of James Joyce's *Ulysses,* around whose bookshop since World War I had been centred all that was most interesting in French literary life, was still pursuing her independent career. During the year, to mark the 25th anniversary of the founding of her "librairie," such distinguished men as Léon-Paul Fargue, Daniél Hálévy, Francis Poulenc, the composer, Paul Valéry and others met together in the little backroom of the Rue de l'Odéon shop. Paul Valéry, on that occasion, read fragments from his new work, *Faust.*

The persecution of liberal writers continued. Jean Wahl, the philosopher, was arrested and put in a concentration camp. It was rumoured that Julien Benda was also sought by the gestapo. André Gide was prevented by the police of Nice from speaking on his chosen subject of the poetry of Henry Michaux.

In the "free zone," Marseilles offered a semitotalitarian atmosphere. The magazine, *Cahiers du Sud,* continued to appear there under the direction of Jean Ballard who offered a haven to a number of the younger men, poets and novelists. *La Revue des Deux Mondes* continued to publish conformist articles by Henry Bordeaux, F. Charles Roux, André Chaumeix, Maurice Genevoix. Charles Maurras, editor of *Action Française,* who was the royalist power behind the throne of Vichy, was a regular contributor to the *Revue Universelle,* which also published Jacques Delebècque. The voice of his former associate, Léon Daudet, was in 1941 silent. Another review, *La Cité Nouvelle,* with contributions by André Desqueyrat and Guy Chastel, had a strictly official direction.

The publisher H. Lardanchet brought out in Lyons *Les Idées Restent,* by Henri Massis, a popular potpourri of reactionary ideas; *Le Troisième Richelieu,* by J. Fouques Duparc; *Le Solliloque de Maurice Barrès,* by René Benjamin; and a novel, *Le Diable à l'Hôtel,* by Emile Henriot. Paul Claudel, the Gothic-Baroque poet, playwright and critic, revealed himself once more in 1941 as a master of prose in his *Présence et Prophétie,* published by the University of Fribourg Editions in Switzerland.

Georges Bernanos, the novelist, who lives in Rio de Janeiro, published *Lettre aux Anglais.* In Buenos Aires, Roger Caillois, a lycée professor, and former member of the Collège de Sociologie in Paris, brought out the first numbers of *Lettres Françaises,* the only exclusively Free French literary review in South America. It was published under the protection of the well-known Argentine review, *Sur,* which also sponsored the regular appearance of French books and pamphlets, such as: *Le Roman Policier,* by Roger Caillois; *Petite Stèle pour Joyce,* by Louis Gillet; *Actualités de La Fontaine,* by Paul Hazard.

The most intense activity in the publication of exile French books in 1941 was to be found in New York and Montreal. *La Maison Française* in New York city began with the publication of a great trio: André Maurois, Jules Romains, Jacques Maritain. It soon branched out. Many other exiled French writers began to appear: André Morize, Robert de Saint Jean, Julien Green, Pierre de Lanux, Geneviève Tabouis, Max Beer, Richard Lewinson, Claire Goll, Robert Goffin, Maurice Coindreau, as well as numerous translations. The *French Forum,* a review issued since 1939, under the editorship of Dr. Henri Barzun, also counted among the activities of the *Editions de la Maison Française.* Also, in New York, Brentano's brought out distinguished French books, signed by such well-known names as Philippe Barrès (on General de Gaulle), Henry Torrès, Roger Secrétain, Michelle Le Normand. In Montreal, the *Edition de l'Arbre* rallied a number of leading French writers with metaphysical tendencies, such as Jacques Maritain, René Schwob, Marie-Alain Couturier, who published, respectively: *Crépuscule de la Civilization, Cinq Mystères en Forme de Retable, Art et Catholicisme. La Relève,* a Catholic review, having among its contributors such writers as Daniel-Rops, Robert Charbonneau, Comte Sforza, began publication in Montreal.

The arrival in the United States during the spring of 1941 of André Breton marked the official transplantation of *Surréalisme* from France to the western hemisphere. Breton's last book, *Humour Noir,* published by Kra in Marseilles shortly after the armistice, was banned by the Vichy authorities. In an interview with him published in a Surrealist number of the American poetry journal *View,* Breton announced his plans to write a *Third Surrealist Manifesto.* (E. Js.)

French Pacific Islands: *see* PACIFIC ISLANDS, FRENCH.
French Somaliland: *see* FRENCH COLONIAL EMPIRE.
French Sudan: *see* FRENCH COLONIAL EMPIRE.
French West Africa: *see* FRENCH COLONIAL EMPIRE.
Frequency Modulation: *see* RADIO: *Scientific Developments*

Frew, Walter Edwin

(1864–1941), U.S. banker, was born July 18 in Brooklyn, N.Y. At the age of 15 he started work as an office boy in a brokerage firm; at 31 he was president of the Queens County bank in Long Island City, Queens; and at 47 he was elected president of the Corn Exchange bank, one of the largest financial institutions in the United States. He was a member of the federal advisory committee of the Federal Reserve Bank of New York and was also a director of many corporations. In May 1929, when the Corn Exchange became a trust company, Frew resigned as president and became chairman of the board of the new institution. He died at his home in New York city, May 19.

Friends, Religious Society of.

The Religious Society of Friends has a membership of 164,209, representing 30 countries and comprising 54 yearly meetings and annual conference groups. In the United States and Canada there were in 1941, 29 yearly meetings with a

membership of 115,201. The Friends general conference is an association of six of these yearly meetings and the regular biennial conference was scheduled to be held at Cape May, N.J., in July 1942. The Five Years meeting with headquarters in Richmond, Ind., is an association of 11 yearly meetings which gathered for their last quinquennial conference in 1940.

The Friends World Committee for Consultation, composed of one representative and alternate from each of the 54 yearly meetings, was established in 1937 and is divided into a European section, American section and oriental section. The European section represents the Friends' groups in Denmark, France, Germany, Great Britain, Ireland, Netherlands, Norway, Czechoslovakia, Sweden and Switzerland. The oriental section draws together Friends in Africa, Pemba, Madagascar, China, India, Japan, Palestine, Syria, New Zealand and Australia. The American section includes Alaska, Cuba, Jamaica, Mexico, Honduras and Guatemala, besides the United States and Canada.

In the United States in 1941 there were 40 elementary and high schools directed by Friends, and there were 13 colleges under Friends' care. More than 150 schools of various natures were conducted throughout the world by Friends in 1941. There were more than 50 Friends' periodicals and more than 40 Friends' centres representing the Society of Friends.

The Religious Society of Friends is a spiritual movement based upon an experimental way of life which recognizes the imminence of God, the sacredness of human personality and the power of nonviolence as expressed in simple, straightforward, honest living. The society has borne a peace testimony for 300 years and seeks to make its pacifist ideals real by means of creative social action which is positive and constructive. Its program of social action is carried out by the American Friends Service committee in America and the Friends Service council in England co-operating in a program of child feeding, assistance to refugees, social-industrial rehabilitation, peace education and civilian public service.

During the summer of 1941 the social-industrial section conducted 17 summer work camps, with 312 university students participating. In these work camps, in areas of social conflict, the students helped construct playgrounds, swimming pools, recreation centres, improved buildings in a share-cropper community and worked on roads, parks and dams in co-operative communities.

Conscientious Objectors.—Civilian public service was organized during 1941 to provide a means of service for conscientious objectors who were released by the National Selective Service for work of nonmilitary nature. In co-operation with the Mennonites and the Church of the Brethren, 18 camps were opened with approximately 1,200 men in all the camps. There were in 1941 about 450 men in the six camps operated by Friends. These men were engaged in such work as reforestation, soil conservation and general rehabilitation and public service. These camps were supported by the pacifist churches and were not under government control, but were subject to government inspection.

Social Service.—The peace section in 1941 undertook some projects of building good will south of the U.S. border. Twelve students helped build a brick schoolhouse in Puerto Rico. Eighteen women went to Torreón, Mexico, to work with the women and children on problems of health and recreational activities.

In Tuxpan, Mexico, the city almost totally destroyed by earthquake, there were 43 workers who helped clean the debris from the streets and rebuild the schoolhouses. In the United States a civilian training unit for women was conducted near Philadelphia, where 34 women prepared themselves for greater usefulness in the skills of gardening, social service and the study of dietetics.

Refugee service continued throughout the year and during the first six months more than 2,000 requests for service were received from people scattered over 45 different nations. Friends' centres of good will continued to befriend refugees in Geneva, Paris, Berlin, Vienna, Amsterdam and Stockholm.

Offices of assistance were also maintained in Marseilles, France; Lisbon, Portugal; Santo Domingo; and Shanghai, China. In the United States interview and placement services were extended through the refugee hostels and seminars—workshops in Iowa, New York, New Hampshire and Pennsylvania.

American Friends co-operated with British Friends in War Victims Relief service. Hostels for children and evacuées and service to blitzed cities with the assistance of the Friends ambulance unit indicate the nature of the service to the dispossessed. One ambulance unit with 40 men went to China by way of the Burma road.

Child feeding and relief continued in unoccupied France, where more than 50,000 school children were fed daily, 2,000 orphan children were gathered in colony homes, 1,000 babies received an extra ration of milk and vitamins. Clothing was collected and sent to England, France, China, Mexico, Santo Domingo, to the share croppers in southern U.S. and the migrant workers in western U.S.

The Five Years Meeting Board of Missions in 1941 conducted schools and hospitals in Palestine, Africa, Cuba, Mexico and Jamaica, and offered services to Tennessee mountain people and Oklahoma Indians. Mission schools were also conducted by Oregon and California Friends in Bolivia, Honduras, Guatemala and Alaska. The Wider Quaker Fellowship was established for persons who desire to have a closer fellowship with Friends while at the same time continuing their previous denominational affiliation.

(L. D. Sh.)

Fruit: *see* Apples; Bananas; Grapefruit; Grapes; Lemons and Limes; Oranges; Peaches; Pears; Pineapples; Plums and Prunes.

FSLIC: *see* Federal Savings and Loan Insurance Corporation.

Fuel Briquettes.

World production of fuel briquettes in 1938 was estimated at 64,834,000 metric tons, including 51,000,000 tons in Germany, 7,475,000 tons in France, 1,712,000 tons in Belgium, 1,323,000 tons in the Netherlands, 936,400 tons in the United States and 724,000 tons in Czechoslovakia. After 1938 no information was available except for some scattered data for 1939, and the output of the United States. Production of briquettes and package fuel in the United States had been increasing and in 1940 amounted to 1,335,387 short tons, of which 1,050,000 tons was briquettes, and 284,513 tons was package fuel, that is, briquettes wrapped in paper for convenience and cleanliness in handling. (G. A. Ro.)

Fuller's Earth.

Competition from other products and improvements leading to greater economy in its use have gradually cut the production of fuller's earth in the United States from 335,600 short tons in 1930 to 146,600 tons in 1940. In the same period imports declined from 7,800 tons to less than 500 tons. (G. A. Ro.)

Furniture Industry.

America's 2,300 household furniture factories enjoyed the greatest boom since World War I in 1941 when dollar volume gained 36% for an estimated total production of $620,000,000, just $39,000,000 below the 1929 all-time peak production of $659,000,000. The only comparable gain was in 1920 when production increased 75% to $500,000,000, due largely to a 60% increase in prices. Contrary to all expectations, even those of the National Furniture Manufacturers association, the last quarter shipments showed the

greatest gain for the year, instead of a loss, bringing the total production of wooden furniture for 1941 to $660,000,000, a gain of 40% over 1940 and the highest peak ever reached in the history of the industry, a gain of 8% over 1929, the previous best year.

Defense housing accounted for perhaps half of the industry's gain, and new home building, the greatest in American history, for the remainder. Replacement purchases have remained fairly steady after 1937.

To produce this larger volume required 135,000 employees, a gain of 12% and a 40% higher pay roll than in 1940. It also required 25% more lumber, finishing materials, steel, fabrics and miscellaneous supplies.

Despite the fact most factories were operating to the limit of their production facilities, the industry completed the year with its backlog of unfilled orders more than double that of 1940, averaging four months output, but was shipping 40% more goods (dollar volume) daily.

During 1941 approximately 50 additional furniture plants were established bringing the total to 2,300 of which 65% were located in 11 states: New York, North Carolina, Illinois, Pennsylvania, Michigan, Indiana, Virginia, Ohio, Massachusetts, Wisconsin and Oregon.

The principal woods used in 1941 were walnut, mahogany, maple, oak, Philippine woods and aspen. It appeared that in 1942 less mahogany and Philippine woods and more walnut, maple and oak would be used.

Defense needs in 1942 were expected to restrict metal furniture, furniture hardware, finishing materials and spring wire for upholstered furniture and bedding. But there was no shortage of domestic hardwoods and substitutes were expected to be used, such as rubber mattress and upholstery filling, while for finishes, the industry might return to varnish since lacquer was scarce in 1941.

Europe.—The furniture industry, except in England and Switzerland, was demoralized and practically extinct due to war. The 400 factories in occupied France were closed. The 100 in Vichy France were hard hit by economic conditions. Germany's 1,000 plants were unable to obtain either supplies or man power. Switzerland's 200 plants, mostly small, had lost most of their customers in other European lands. Belgium and Italy, both large producers before the war, were operating only to meet war requirements. England's 1,200 plants, mostly small, were in partial operation caring for domestic needs. The U.S.S.R.'s 500 factories were closed by war. Canada's 100 factories were enjoying their biggest boom. (J. A. G.)

Furs. For the first nine months of 1941 the American fur industry followed up the gains of 1940 by a further increase in the volume of its business. It enjoyed a strong consumer demand throughout the early months, the spring season and the summer. Production and retail sales were about 50% greater than for the corresponding nine months of 1940. Skin prices advanced rapidly in July and August. There was a boom in fur apparel sales in September. This stimulation in public purchasing of furs was due largely to the new 10% federal tax on the retail selling price of all fur apparel and fur-trimmed apparel (where the fur was the part of chief value). People purchased furs early in order to "beat the tax" effective Oct. 1. There was also the incentive to buy furs since it was believed that fur prices would advance steadily because of war conditions and the cutting off of importations of fur skins from foreign sources.

The fur industry was misled by the activity of the summer months and made the mistake of concluding that business would continue throughout the winter months at the same pace as in August and September. Too much confidence was placed in the creation of a new consumer group in the defense industries. Actually the business practically came to a stop by the end of October. The fur trade and the retail distributors of fur apparel found themselves in November overproduced, overstocked and overextended. Unseasonably mild weather, the ever-growing threat of war and finally the attack on the United States by Japan in the Pacific on Dec. 7 gave the finishing touches to a disastrous three months for the American fur trade. Profits made by many firms during the first nine months were largely wiped out during the last three of 1941. The blow fell heaviest on the New York manufacturers and the east coast and west coast retail establishments. They ended the year with heavy stocks of fur garments, a large proportion of which was high-priced merchandise. Price cutting started before the end of December. Notwithstanding the slump in the final quarter of the year, it is estimated that more units were sold than in 1940 and the average of prices obtained was higher.

The United States imported an estimated $90,000,000 worth of furs in 1941 compared with $75,626,000 in 1940. Government import figures were available only for the nine months January to September ($76,213,687). Import figures were withheld after September as a war measure. Large quantities of furs came from Russia late in the year, following the break between the soviets and Germany.

Africa and Afghanistan again were the United States' greatest sources of supply for the favourite fur, Persian lamb. Imports were over 4,000,000 skins valued at $24,000,000, including the Russian shipments of Persians. Australia and New Zealand shipped most of the $15,000,000 worth of rabbitskins imported. China furs were received in reduced quantities and under great difficulties because of Japanese control over Chinese ports. Trade in European furs ceased, except for limited quantities of rabbitskins from England. The United States imported most of the Canadian 1940–41 fur production, estimated at about $16,000,000 in value. Imports of lambskins, nutria, guanaquito, hare, ocelot and other furs from the South Americas increased. Prices on all items were much higher by the summer of 1941 than at any time in 1940.

Exports dropped to about $4,000,000 compared with $11,236,000 in 1940.

The unexpected decline in consumer demand in the fall brought about a readjustment in the prices quoted on new crop raw American and Canadian furs. Prices opened from 15% to 50% above the levels of Nov. 1940. Country traders paid high prices early in the season only to find no buyers in the markets. Mink breeders found no buyers for their fine skins in December. There was no market for anything except silver fox, which was no higher in price than a year before. The condition continued throughout December.

The fur trade had no immediate need for skins. There was a large carry-over of mink, Persian lamb, muskrat (the three big furs of fashion). War conditions clouded the outlook. The year 1942 was obviously filled with uncertainty. Skin prices declined. By the end of December they were, with a few exceptions, on the same basis as in Dec. 1940.

Insolvencies in the fur industry totalled 83 for the 12-month period Dec. 1940 to Nov. 1941, according to the American Fur Merchants Association, Inc., New York. Of them 63 were in New York and losses were $1,354,184. Failures outside of New York were 20 representing losses of $302,171. Good recoveries were made in most instances. (During Dec. 1941 there were about thirty recorded insolvencies in the trade.)

The estimated production of the trade in 1941 was valued at about $200,000,000 wholesale. Retail valuation was impossible to

estimate because of the decline in consumer demand and the reductions in prices during the final quarter of the year.

(W. J. Bt.)

FWA: Federal Works Agency.

Gambia: *see* British West Africa.

Gandhi, Mohandas Karamchand (1869–), Hindu nationalist leader, was born at Porbandar (Kathiawar), India. For his biography, see *Encyclopædia Britannica*. On Jan. 22, 1937, Ghandi announced his retirement from active Indian politics, but by 1940 he was as prominent as ever in Indian affairs of state. The All-India congress on March 20, 1940, delegated to him the direction of negotiations with Great Britain for national independence. On Sept. 17, 1940, the congress committee elected Gandhi its leader by a vote of 192 to 7; only the communist members opposed him.

After a Christmas (1940) truce, Gandhi resumed his campaign of civil disobedience against British rule, despite pleas from London and from within the All-India congress itself. In April 1941 he announced that the congress had temporarily abandoned its aim of independence for India, but he reaffirmed his personal policy of nonviolence. On Dec. 30, after the congress had abandoned the civil-disobedience program also, Gandhi resigned from its leadership. (*See* also India.)

Garnet: *see* Abrasives.

Gas, Natural. Total production of natural gas in the United States usually exceeds the marketed production by about one-third, somewhat more than half coming from gas wells, and less than half from oil wells. Losses and wastage run 20% to 25% of the total output, and up to 5% may be pumped back into the ground, either for storage or for repressuring the field. In 1940 the marketed production was 2,672,000,000,000 cu.ft., an increase of 8% over 1939; the producers used 700,000,000,000 cu.ft. for light, fuel and power in the producing field, domestic fuel used 442,000,000,000, commercial heating and lighting 132,000,000,000, the production of carbon black 369,000,000,000, electric power and public utility plants 183,000,000,000 and petroleum refineries 100,000,000,000; about 5,000,000,000 was exported, mostly to Mexico, and the remainder went to varied industrial uses not classified. Of the total, 17% was used for domestic, 5% for commercial and 78% for industrial uses.

When the peak load demand on a long gas transmission line exceeds the capacity of the line, it becomes a serious matter, involving the laying either of a new and larger line, or of a second line to supplement the capacity of the first. To handle this problem in Cleveland, there was built in 1940 the first large-scale plant for the liquefying of natural gas, the product of which can be stored in much less space and at correspondingly less cost than to provide storage for the gas itself. This plant liquefies and stores the surplus gas at periods of low demand, and in peak load periods the stored liquid is gasified and fed to the distribution system to supplement the normal capacity of the system. Although the plant was built primarily for this purpose, the problems involved in the storage and transportation of the liquid gas were being studied, with a view of broadening the field of use of the liquid gas.

About 90% of the natural gas output of the United States was treated to remove a small percentage of gasoline vapour, before it is piped away for use. In this way there was produced in 1940 some 2,320,000,000 gal. of natural gasoline, most of which is blended with the gasoline from crude petroleum refineries.

(G. A. Ro.)

Gasoline: *see* Petroleum.

Gaulle, Charles de (1890–), French soldier and leader of the forces of Free France after the armistices of June 22–24, 1940, graduated from St. Cyr military college at Paris shortly before the German invasion of France in 1914. Wounded three times during World War I, he was captured by German troops at Verdun in 1916, but escaped and saw further action on the western front and in the near east. Foreseeing the future tactical importance of tanks and combat cars, he waged a one-man campaign to persuade France to mechanize her infantry after 1918, but army officers preferred to place their trust in such measures of immobile defense as the Maginot line. The first several days of Germany's lightning thrust through Belgium and the Netherlands in May 1940 proved the correctness of de Gaulle's theories, and he was belatedly made undersecretary of war in Reynaud's cabinet. He parted ways with Marshal Pétain's government when it elected to surrender, and he fled to London. There on June 23, 1940, he announced formation of the French National committee, an expatriate military and political organization. Much of French Equatorial Africa, French Oceania, French India and Caledonia rallied to de Gaulle's banner despite the fact that the Vichy government had condemned him to death *in absentia* for treason. After an abortive attempt to capture Dakar, Senegal, with the support of British warships Sept. 23–25, 1940,

GEN. CHARLES DE GAULLE consolidated his African positions in 1941; he also added Syria and Lebanon, and St. Pierre and Miquelon to the banner of the Free French

de Gaulle landed troops at Libreville Nov. 9 and within three days had secured all of Gabun.

The year 1941 saw an expansion of de Gaulle's Free French movement—geographically by the addition of Syria and Lebanon (*q.v.*) July 12 and St. Pierre and Miquelon Dec. 24, militarily by additions to its army and navy; and politically by formation Sept. 23 of the Free French National council. De Gaulle named himself president of the council and appointed a regular cabinet.

In April 1941, de Gaulle left London for a five-month inspection tour of his provinces; he was present at the occupation of Syria and Lebanon and witnessed the beginning of the Iranian campaign in August. From London or from Brazzaville he issued many appeals to the Vichy French colonies to join him; he also pleaded with the citizens of occupied and unoccupied France to support his cause, or at least not hinder it. During the Germans' mass execution of French hostages in October he appealed to the French to discontinue violence and to remain inactive for five-minute periods instead as a protest against the slayings. In September, de Gaulle concluded a military and political alliance with the U.S.S.R.; in November he secured lend-lease aid from the United States for Free France; on Dec. 8 he announced that the Free French National council was at war with Japan.

Gehrig, Henry Louis (1903–1941), U.S. baseball player, was born in New York city, June 19. A husky youngster, he played baseball at Columbia university and found the game so absorbing that he left college for a tryout in 1923 with the New York Yankees. But he lacked experience and was sent to minor league teams for further seasoning. In 1925 he returned to the Yankees and, on June 2 of that year, the illness of the regular first baseman gave the "rookie" a chance to display his talents. Not only did Gehrig win a permanent job at first base, but for the next 14 years he played 2,130 consecutive games, setting a modern baseball record. In addition, he set 14 other season records and tied three others during his career, and was surpassed in hitting home runs only by George Herman (Babe) Ruth, a Yankee teammate. Gehrig's record for consecutive games won him the nickname of the "Iron Horse." But in 1939 he lost his speed and co-ordination and voluntarily ended his consecutive game record on April 30. A medical examination disclosed that Gehrig was suffering from a form of paralysis and he retired from baseball at the close of the 1939 season. In Oct. 1939 Mayor La Guardia of New York appointed Gehrig to the municipal parole commission, a move that was hailed enthusiastically because of Gehrig's reputation as a gentleman and sportsman. He continued in that position until his death at his home in the Bronx, N.Y., June 2.

Gems and Precious Stones. The United States is the world's leading market for gem stones of all kinds. Imports in 1940 are shown in the table.

U.S. Imports of Gem Stones, 1940

	Carats	Value
Diamonds: rough or uncut	227,886	$11,595,701
cut but not set	321,471	22,001,719
Emeralds: rough or uncut	14,364	6,015
cut but not set	16,093	304,104
Pearls: natural	..	224,101
cultivated	..	355,505
Other gem stones: rough or uncut	..	153,858
cut but not set	..	2,191,513
Imitation or synthetic gems	..	819,336
Marcasites: real	..	6,790
imitation	..	18,071
Total value	..	$37,767,705

This amount was a decrease of 7% from 1939, largely because of inability to secure the desired amounts of cut stones, both natural and synthetic, though this reduction was offset to some extent by increased imports of uncut stones.

The impact of war on the gem trade was considerable, involving as it did numerous and widespread regulatory decrees on importation, exportation, sale and taxation in all countries concerned in the transaction. Along with these, there was the widespread disorganization of the cutting industries in Belgium, Netherlands, France, Germany, Switzerland and Czechoslovakia. In spite of all of these difficulties, imports into the United States during the first eight months of 1941 had a total value of $20,960,828, an average rate 17% less than that of 1940. (*See* also MINERALOGY.) (G. A. RO.)

General Education Board: *see* ROCKEFELLER FOUNDATION.

General Federation of Women's Clubs: *see* WOMEN'S CLUBS, GENERAL FEDERATION OF.

Genetics. In 1941 genetic studies on over 60 animal groups were published, with most attention given to the fruit-fly, *Drosophila,* man and poultry. In over 50 plant groups investigated, corn, cotton, tobacco and tomato led the list.

Human Genetics.—Ford and Mason reported that all of the Dionne quintuplets were "tasters" of phenylthiourea. Snyder, Baxter and Knisely found from a statistical study of 190 sibpairs that blood group, blood type and reaction to phenylthiocarbamide genes are not linked. Burks and Wyandt reported independent inheritance of sex, mid-digital hair and oval red blood cells and possible linkage of oval cells and the A-B agglutinogen factors. Haldane discovered that recessive spastic paraplegia is a partially sex-linked gene, carried in both X and Y chromosomes. He suggested that modifying genes may be responsible for the time of onset of certain hereditary diseases, such as Huntington's chorea. A concise and up-to-date Medical Genetics by L. H. Snyder presented clearly the role of heredity in human disease and discussed the possible application to medicine of research in human genetics.

Animal Genetics.—In the rat, Castle and King reported linkage of recessive anaemia to curly and brown and of wobbly gait to hairless, the latter case establishing a third linkage group. In poultry new mutants described were short upper beak by Landauer; polydactyly by Warren; dominant chalky shell by Taylor and Lerner; recessive microphthalmia by Jeffrey; and sex-linked imperfect albinism by Mueller and Hutt. Cooper for the first time observed spindle fibres in living material, using a mite egg for this study. White reported extensive work on the evolution of sex chromosomes in the Orthoptera. Many new cases of hybridization in the genus *Drosophila* were reported by Patterson, Sturtevant, Stone and others. After genetic and cytological comparison of *Drosophila* species, Sturtevant and Novitski concluded that during the evolution of this genus few translocations between chromosome elements have occurred. Philip Bridges published a cytological map of salivary chromosome III in *Drosophila melanogaster* showing over 2,000 bands. By urea-sodium hydroxide treatment Kodani demonstrated alternate regions of euchromatin and heterochromatin in salivary chromosomes of *Drosophila.* Helfer's work on breakage of chromosomes following X-raying established that natural chromosome inversions in *Drosophila pseudo-obscura* were not the result of pre-existing weak spots in the chromatin. Dempster and Kaufmann concluded independently by X-ray work on *Drosophila* sperm that no short time factor was involved between two breaks leading to chromosome aberration, as found by Sax in Tradescantia. Mueller's transfer of the fourth chromosome from *Drosophila simulans* to *Drosophila melanogaster* demonstrated interspecific sterility factors in this small chromosome.

Plant Genetics.—McClintock reported that some recessive mutants in corn are produced by small homozygous deficiencies. She found that broken ends of corn chromosomes could become stabilized. Anderson and Erickson suggested that "in hybrids between diverse parents, natural selection would tend to encourage those modifiers favouring one parental extreme or the other." They presented evidence that this theory of "antithetical dominance" might account for genetic peculiarities in corn, a plant of hybrid origin. Harland, Atteck and Silow published extensively on hybridization in cottons, dealing with the transfer of genes from one species to another and their expression in the new reaction system. The Meyer medal of the American Genetic association was presented to Dr. Navarro de Andrade for introduction of eucalyptus into Brazil.

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Geographical Society, American: *see* AMERICAN GEOGRAPHICAL SOCIETY.

Geology. Geological publications were again restricted, particularly outside of the United States, because of the concentration of scientific endeavour on war activities. This situation was offset somewhat by many reports on strategic minerals. The federal and some of the state geological surveys were devoting much attention to these resources.

More attention was being given to college curricula in the training of geologists and geophysicists. At least two American mineral industry societies had committees working on this problem in an effort to standardize curricula.

History of Geology.—The fiftieth anniversary volume of the Geological Society of America, entitled *Geology, 1888–1938* represented a review of the development of the various branches of geology by many specialists, each an authority in his field. Inasmuch as the greatest development of geology took place during this period the volume was of noteworthy importance.

Physical Geology.—The interest in submarine canyons continued and several contributions were made on this subject.

Revisions of several standard textbooks on geology appeared. Notable among these were *Outlines of Physical Geology* by Longwell, Knopf and Flint and *Introduction to Physical Geology with Special Reference to North America* by Miller.

Part two of the *Reports of the Greenland Expedition of the University of Michigan* covering meteorology, physiography and botany under the editorship of Hobbs appeared.

Historical Geology.—A new edition of *Outlines of Historical Geology* by Schuchert and Dunbar was published. This had been combined with *Outlines of Physical Geology* by Longwell, Knopf and Flint to form the second edition of *Outlines of Geology*.

The fourth edition of the widely adopted *Textbook of Geology, Part Two: Historical Geology* by Schuchert and Dunbar represented a great improvement over the early editions.

The thought provoking book, *The Rhythm of the Ages* under the authorship of Grabau appeared in Peking in 1940. This is a synopsis of the four volume work entitled *Palaeozoic Formations in Light of the Pulsation Theory* (1936–39) and a further application of the theory to all younger geological formations.

The semi-popular work entitled *The Last Million Years* by Coleman, edited by Kay, constituted an important addition to the literature on Pleistocene geology.

Sedimentation.—The exhaustive work by De Geer, *Geochronologia Suecia Principles* which is a summary of the author's pioneer contributions on geochronology based on the study of varves represented an outstanding contribution for the year.

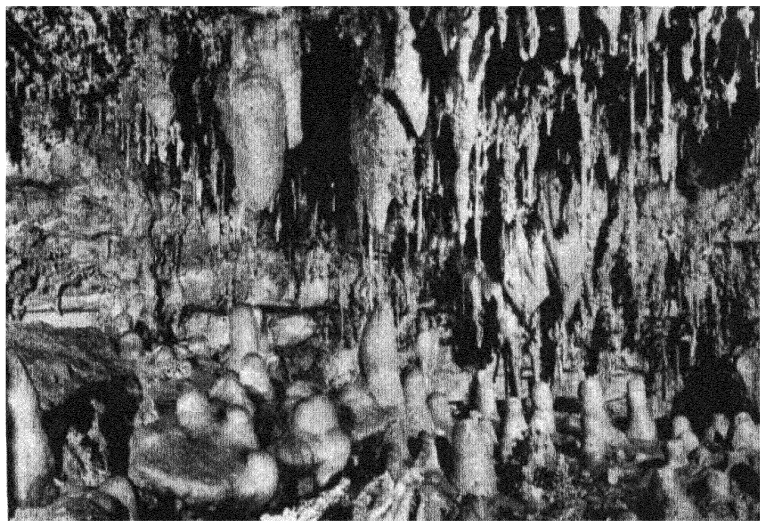
Technical Bulletin 695 of the United States department of agriculture, *Some Principles of Accelerated Stream and Valley Sedimentation* by Happ, Rittenhouse and Dobson was expected to serve as a model for future investigations on soil erosion.

Structural Geology.—*Outlines of Structural Geology* by Hills which came from the press in 1940 is a good summary of the modern conception of the fundamental principles of this subject.

The fourth edition of Lahee's *Field Geology* is a substantial improvement and enlargement of the earlier editions of this excellent handbook.

Petrology and Petrography.—Fenton's *The Rock Book* represents a semi-popular story of the rocks intended for the layman. The former widely used *Handbook of Rocks* by Kemp was revised by Grout. Two contributions on sedimentary petrography were issued, namely, the third edition of the classic work *Sedimentary Petrology* by Milner (1940) which is adapted to the use of the petroleum geologist and *Methods of Study of Sediments* by Twenhofel and Tyler (1941), a manual for students or workers in commercial laboratories.

Mining Geology.—Greater attention was being given to structural control in connection with the localization of ore bodies and to the application of geological and geophysical methods to ore-finding as a result of the demands of the second world war. Publication of reports on strategic mineral deposits was being given priority over other types of investigations.



THE "CRATER ROOM," one of a series of chambers in Wyandotte cave, Ind., discovered by guides in 1941

The comprehensive German book on the geology of coal by Stutzer was translated and revised by Noé in 1940. The second edition of Emmon's text and reference book, *The Principles of Economic Geology* was issued in the same year. A revision of the classic *Mining Engineers' Handbook* by Peele prepared with the collaboration of J. A. Church appeared.

Petroleum Geology.—A popular account by Ball describing all phases of the oil industry including the applications of geology bears the title *This Fascinating Oil Business*.

The American Association of Petroleum Geologists continued to sponsor research activities by numerous individuals on fundamental problems of the science. The same association, under the editorship of Levorsen, published the symposium *Possible Future Oil Provinces of the United States and Canada*. This work is of paramount importance in connection with the currently active search for new petroleum reserves in North America. The association also under the editorship of Levorsen issued a report on *Stratigraphic Type Oil Fields*, a symposium by 52 authors. *Source Beds of Petroleum* by Trask and Patnode represents a report of the investigations of the American Petroleum institute and the federal geological survey over the period 1931 to 1941. The results of their extensive studies on *The Time of Origin and Accumulation of Petroleum* by Van Tuyl and Parker were published.

From the standpoint of the petroleum industry as a whole, the excellent treatise *Elements of Petroleum Industry* prepared by 20 contributors under the editorship of De Golyer and published by the American Institute of Mining and Metallurgical Engineers represents one of the most notable works of the year.

Engineering Geology.—Geology continued to be used extensively in engineering construction work. A valuable contribution to this phase of the science is *Cofferdams* by White and Prentis (1940). (*See* also MINERALOGY; PALAEONTOLOGY; SEISMOLOGY.) (F. M. V. T.; B. H. P.)

George VI (1895–), king of Great Britain and Ireland (see *Encyclopædia Britannica*) together with Her Majesty the Queen again spent a busy year, and there must be few bombed areas or large armament factories between Land's End and John o'Groat's that they did not visit. A complete list of their tours is unnecessary, but whether it was Aberdeen (where the queen opened the new King George VI bridge), Edinburgh or Glasgow; Cardiff, Swansea and the most bombed parts of south Wales; the great and battered cities of the midlands and Merseyside; Portsmouth, Plymouth, Devonport or the east end of London, the story was ever the same; the ruins of little houses were inspected and comforting words spoken to the men and women who had lost them; there were receptions by mayors and lord lieutenants in wrecked guildhalls and tasting of dinners in community canteens and "British restaurants"; decorations of service and civilian heroes; endless reviews of troops and civil defense workers; visits to bomber and fighter commands, men of the merchant service—and to hospitals; and while the queen launched the new battleship, the *Duke of York*, and learned how to handle an electric riveter, the king had a personal talk with the shop-stewards at a big works and at Rosyth held an investiture in the dockyard cinema. Soon after he was visiting the

Polish forces training under General Sikorski on a wild moorland stretch in Scotland, then welcoming the Home Guard as they took over the King's Guard at Buckingham palace on the first anniversary of their formation; next day he drove a tank on a factory's testing-ground, and a little later received the dominion and Allied representatives after their conference in June.

The king's voice was not heard on the radio after his empire message—addressed specially to evacuated children at home and overseas—on Christmas day, 1940; but in August the queen broadcast her heartfelt thanks to the women of America for their sympathy no less than for the unceasing flow of canteens, ambulances and medical supplies that came from the United States. The king's message to India in March, thanking the princes and peoples for the magnificent support they were according the common effort, and his speech at the opening of the new session of parliament in November, were his principal public utterances.

Two departures from royal precedent are well worth recording. In Nov. 1940 the king received from the chairman of the Trade Union congress, George Gibson, the gold badge of the T.U.C., a specially struck variant, incorporating the royal arms, of that usually reserved for distinguished foreign visitors; and in March 1941 he went himself to the railway station to greet John Winant, the newly arrived American ambassador—who had been welcomed by the duke of Kent at the Bristol airport—thereby returning the compliment paid to the British ambassador by President Roosevelt when he personally met him on his arrival in American waters. (L. H. D.)

George II (1890–), king of Greece, was born at Tatoi near Athens on July 20, the eldest son of King Constantine, and succeeded to the throne for the first time in 1922. Deposed March 25, 1924 after a series of uprisings, he spent the next 11 years in exile until his recall by the Greek assembly in 1935. For his biography, see *Encyclopædia Britannica*. On Oct. 28, 1940, the day that Italy began its invasion of Greece through Albania, George assumed command of the army. His popularity increased in proportion to the Greek successes in Albania, and he spent considerable time at the front with his troops. On April 23, 1941, as German hordes approached Athens, George fled with members of his government to Crete after issuing a manifesto to the effect that the fight would continue. A month later he narrowly escaped capture by nazi parachute troops in Crete. After hiding in a shepherd's cave, he traveled overland afoot and by mule to the southern shore, where he was evacuated by a British destroyer and taken to Cairo with his premier, Tsouderos. From Cairo he went to Johannesburg, thence to London, where he arrived Sept. 22 to form his government-in-exile.

Georgia. A southern state, one of the original states of the United States, the fourth to ratify the constitution, popularly known as the "Empire State of the South." Area, 58,876 sq.mi. (including 358 sq.mi. of inland water); pop. (1940) 3,123,723. The urban population was 1,073,808 (34.4%), rural, 2,049,915. Capital, Atlanta (302,288). The next largest cities are Savannah (95,996); Augusta (65,919); Macon (57,865).

History.—Eugene Talmadge was inaugurated governor in Jan. 1941, the second man in the state's history to hold the office a third term. Numerous amendments to the constitution were made by referendum in June; one important amendment extended the term of governor and state school superintendent from two to four years. The entire state was placed on eastern standard time March 22, 1941. The biennial session of the General Assembly provided for reorganization of government departments; reduction in salaries of elected officials; more centralized control over state finances by the governor; family drivers' licences; reduction in unemployment compensation tax on employers. Ellis G. Arnall announced his candidacy for the gubernatorial nomination subject to the Democratic primary, 1942. Principal state officials for 1941 included: Eugene Talmadge, governor; John B. Wilson, secretary of state; Ellis G. Arnall, attorney general; George B. Hamilton, state treasurer; B. E. Thrasher, state auditor; Homer C. Parker, comptroller general; M. D. Collins, superintendent of schools; Tom L. Linder, commissioner of agriculture.

Education.—Enrolment in public schools in the biennial report dated June 30, 1940 was as follows: elementary, 642,632 (white, 390,538, Negro, 252,094); high school, 141,880 (white, 120,509, Negro, 21,371); state university (Sept. 1941) 2,980. The teaching staffs were enumerated as follows: elementary, 16,822 (white, 10,912, Negro, 5,910); high school, 5,957 (white 5,067, Negro, 890); state university (Sept. 1941) 254.

Charities, Correction.—Total payments for the year ending June 30, 1941: old age assistance, $3,992,567; blind, $170,974; dependent children, $1,165,169; crippled children $182,932. WPA employment in November, 1940 was 40,430; in November, 1941, 24,412. Population of the state institutions in 1940 was as follows: State hospital, 8,171; School for the Deaf, 225; Training School for Mental Defectives, 1,423; Academy for Blind, 131; Georgia State prison (1939), 915; Boys' Training school, 155; Training School for Girls, 143; Confederate Soldiers' home, 7.

There were 25 almshouses (county) with a population in 1940 of 528 whites and 213 Negroes.

Communication.—State road mileage in 1940 was 13,212.5, including 6,172 miles of paved roads. Railroad mileage, 1940, exclusive of yard and side track, was 7,960. Telephones in use, Nov. 1941, numbered 235,640.

Banking and Finance.—On Sept. 24, 1941 there were 238 state banks with deposits of $188,844,000, and 51 national banks with deposits of $314,416,000. The state revenue department collected in the year ending June 30, 1941 $51,348,312. The largest sources of revenue were the motor fuel tax and the income tax. Total budget appropriations for the year were $52,526,089.84. The state debt was reduced $13,623,000 in the first six months of 1941; on June 30, 1941 it stood at $16,135,000.

Agriculture.—The value of Georgia's main crops for 1941 totalled $178,042,000, an increase of 5.4% over 1940.

Table I.—*Leading Agricultural Products of Georgia, 1941 and 1940*

Crop	1941	1940
Cotton (lint), bales	624,000	1,010,000
Cotton (seed), tons	278,000	449,000
Corn, bushels	42,000,000	46,849,000
Peanuts, pounds	525,950,000	581,625,000
Tobacco, pounds	54,655,000	77,480,000
Hay, tons	790,000	803,000
Velvet beans, tons	505,000	593,000
Sweet potatoes, bushels	7,245,000	5,880,000
Oats, bushels	10,516,000	8,702,000
Peaches, bushels	5,561,000	4,216,000

Manufacturing.—There were, in 1939, 3,150 manufacturing establishments in Georgia which produced goods valued at $677,402,657 and paid $132,188,496 in salaries and wages.

Table II.—*Principal Industries of Georgia, 1939 and 1937*

Industry	Value of Products	
	1939	1937
Cotton broad woven goods	$131,627,016	$164,173,283
Food and kindred products	39,454,548	*
Cotton yarn and thread	38,200,073	46,920,575
Paper and allied products	24,457,566	*
Meat packing	23,648,314	24,987,606
Fertilizer	19,049,712	21,711,717
Saw mills, etc.	18,174,027	*
Cotton seed oil, etc.	16,487,862	27,268,138
Curtains, draperies, bedspreads	15,267,446	6,157,587

*No comparable figures.

Mineral Production.—Georgia's mineral deposits were unknown and undeveloped until 1829, when gold was discovered in McDuffie, White and Lumpkin counties. The value of mineral production in 1940 was $14,836,372. Georgia led the nation in the production of ochre, kaolin, barytes and fuller's earth. Principal mineral products in order of value were stone, raw clay, clay products and cement. (E. C. Gr.)

Georgia Warm Springs Foundation. The foundation is a membership corporation of the state of New York. It is a charitable, non-profit making corporation and conducts a thoroughly modern and scientifically equipped institution at Warm Springs, Ga., with a capacity of 100 beds, for the study and treatment of the after-effects of poliomyelitis (infantile paralysis) under the direction of a competent medical staff. The foundation is the only institution devoting its energies entirely to infantile paralysis. It concentrates its efforts upon a study of types of aftereffects cases in an effort to improve and perfect methods of treatment and make the

knowledge gained thereby available to the medical profession and the public. As a result of the construction of a building providing complete hospital facilities, not previously available on the site, the year 1940 was the first during which the foundation was able in a single building to care for patients and study every phase of treatment of the aftereffects of infantile paralysis.

In 1941 a school for the postgraduate training of physiotherapists was started, financed by a grant from the National Foundation for Infantile Paralysis.

Franklin D. Roosevelt was, in 1941, president of the foundation and Basil O'Connor of New York city was chairman of the executive committee and treasurer. The foundation's address is 120 Broadway, New York, N.Y. (B. O'C.)

German-American Bund. G. Wilhelm Kunze, who succeeded Fritz Kuhn as head of the German-American bund following the conviction and imprisonment of Kuhn for forgery and misuse of the funds of the bund, was indicted with eight others by a New Jersey grand jury in the summer of 1940 for trying to stir up race hatred. When the accused were brought to trial in Jan. 1941 they were all convicted and sentenced to imprisonment for terms varying from one year to fourteen months, but the state supreme court in December reversed the convictions on the ground that the law they were accused of violating was unconstitutional as an unwarranted interference with freedom of speech. The camp in Sussex county, N.J., at which the race hatred addresses were made was closed by the sheriff on the ground that it was a public nuisance. In June 1941 the New Jersey legislature repealed the charter of the bund, thus making it illegal for it to operate in the state. In the previous April the Florida legislature had passed a bill outlawing the bund and all organizations seeking the overthrow of the government by force. In June the wife of Fritz Kuhn sought to obtain the release of her husband on parole from the Dannemora prison in New York. The parole board refused to release him, the chairman saying that release would not be compatible with the welfare of society.

In the first issue following the Japanese attack upon Pearl Harbor on Dec. 7, the *Weckruf und Beobachter*, weekly organ of the bund, announced that the bund would set the example for German-Americans "to conform loyally and unreservedly to the duties of citizenship." A few days later the federal government took possession of the offices in New York city occupied by this newspaper with the bund and the German-American Business league, and closed them to the public. At about the same time FBI agents raided a bund camp at Sellersville, Pa., and arrested the leader. (G. W. Do.)

German Literature. In the realm of literature, as in everything else, national socialism has sought to organize, control and direct. All works must be submitted for approval by the nazi authorities before being printed. This may not be a serious handicap to political, military and technical works which bulk large in the German book output. But for the novelist who would like to portray current problems the path of safety is difficult. Consequently there was a strong tendency toward novels and books of phantasy in which escape from reality and the present were the characteristic features. These "timeless" books give the author scope for his imagination with less fear from the censor, and give the reader welcome diversion from the hard facts of war and its privations. Good examples of this escape literature were: Hans Fallada, *Kleiner Mann—Grosser Mann—Alles Vertauscht,* a story of "the troubles of a little family suddenly lifted by an inheritance out of obscure misery into the shiny hell of a millionaire's life"; Ina Seidel, *Unser Freund Peregrinus,* a kind of dream novel; and Grete Rehder, *Elredefleth,* the story of a submerged saga-village in Holstein.

Two-thirds of the German newspapers were in 1941 owned and published by the nazi party. The other third, under private management, received daily directions from Dr. Goebbels and differed little from the official press. As all the newspapers contained but little trustworthy news of foreign countries and only the official nazi version of domestic news, it is not surprising that there were only half as many newspapers in 1941 as when Hitler came to power in 1933. Their total daily circulation in Oct. 1941 was estimated at 25,000,000 by Max Amann, head of the nazi party publishing office.

Outside Germany, beyond the reach of the censor and the secret police, noted German refugee authors like Thomas and Heinrich Mann, Lion Feuchtwanger, Franz Werfel and many others continued to enrich German literature. Most important for the understanding of Hitler's character and power were works by refugees who sought to explain why they once worked with him and later turned against him: Fritz Thyssen, *I Paid Hitler;* Hermann Rauschning, *Make and Break with the Nazis;* and Otto Strasser, *L'Aigle Prussien sur L'Allemagne.*

BIBLIOGRAPHY.—For brief reviews of German literature, see *Books Abroad,* a quarterly published by the University of Oklahoma. (S. B. F.)

Germany. A totalitarian state or dictatorship, known as the "third reich," in central Europe south of the North and Baltic seas and north of the Alps, Italy and the Balkans. Capital, Berlin (*q.v.*); reich chancellor and leader (Fuehrer), Adolf Hitler (*q.v.*).

Area and Population.—The area of the old reich was 181,742 sq.mi.; population 66,029,806, census of June 16, 1933. According to the census of 1939, published in 1940, the total population of Greater Germany was 79,364,410, including the following populations of the *Länder:* Prussia (excluding the Saar) 41,762,042; Bavaria (excluding the Saar) 8,280,092; Wurttemberg 2,907,168; Mecklenburg 910,828; Baden 2,518,105; Saxony 5,206,863; Thuringia 1,760,597; Hesse 1,469,911; Oldenburg 582,402; Brunswick 599,210; Anhalt 436,215; Lippe 188,600; Hamburg 1,682,222; Schaumburg-Lippe 54,164; Bremen 400,088; Saarland 863,738; Austria 7,009,016; Sudetenland 2,945,263.

There were (1933) 104 cities with a population of more than 50,000 each, and 567 cities and towns with more than 10,000 each. About 32.5% of the population lived in villages of less than 2,000; 10.6% in towns of between 2,000 and 5,000; and 7.3% in towns of between 5,000 and 10,000; almost half the population lived in communities of more than 10,000.

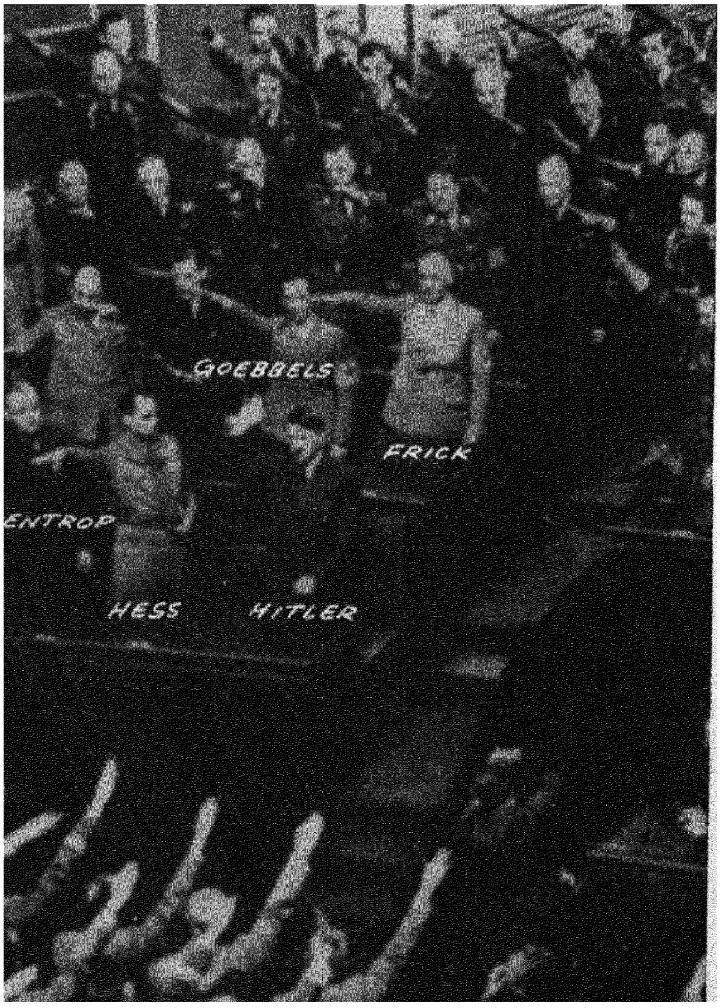
The population of the "greater reich," according to the census of May 17, 1939, was approximately 86,170,000 if the "protectorate" of Bohemia-Moravia is included. This greater reich was created by Hitler's annexation of the following territories: Jan. 13, 1935, Saarland, 864,000; March 13, 1938, Austria, 7,008,000; Oct. 1, 1938, Sudetenland, 2,945,000; March 15, 1939, Bohemia-Moravia, 6,805,000; March 22, 1939, Memel territory, 153,000. In addition, by his war against Poland in Sept. 1939, Hitler added to the 86,000,000 of the greater reich the populations of Danzig, the Polish Corridor, Posen and a strip of territory east of Silesia, regions aggregating 36,242 sq.mi., with a population of 10,000,000. The Poles, as far as possible, were exterminated or removed from these conquered districts and their places taken by Germans from the reich or by tens of thousands of Germans "repatriated" from their old homes in Estonia, Latvia and Lithuania. Hitler also conquered more than half of the rest of Poland; its population of about 15,000,000 was organized under a national socialist administrator, Dr. Hans Frank, as the

"general government" of Poland. Poles, if loyal to their conquerors, were allowed to hold subordinate official positions. Half a million Jews were herded into a walled ghetto in Warsaw.

The reich also controlled more or less completely the governments of the populations conquered in the spring and summer of 1940: Denmark (3,777,000), Norway (2,900,000), Netherlands (8,640,000), Belgium (8,386,000), Luxembourg (300,000) and the northern three-fifths of France, known as "occupied France" (117,000 sq.mi. with an estimated population of 27,800,000). The remaining two-fifths of the former French republic, known as "unoccupied France," and the French colonial empire were left under the Vichy government of Marshal Pétain. Some 70,000 French families were suddenly expelled from Lorraine to unoccupied France, and Lorraine ceased to exist. On Nov. 30, 1940, it was incorporated directly into the "third reich" and combined with the Saar territory under *Gauleiter* (District Leader) Joseph Buerckel as the "Westmark." Alsace, from which French families were also expelled in large numbers, was placed under the administration of Robert Wagner, *Gauleiter* of Baden.

In addition, by the infiltration of German troops and secret agents, Germany gradually acquired domination over Slovakia in 1939 and over Hungary, Rumania and Bulgaria in the winter of 1940–41. In April 1941 a blitzkrieg against Yugoslavia (15,000,000) and Greece (7,000,000) destroyed the independence of those countries, and brought their territories directly or indirectly under German control. Finally, attacking the U.S.S.R. June 22, 1941, Hitler advanced within five months almost to Moscow and reached a line running from Leningrad in the north to the eastern part of the Sea of Azov on the south. In late November and December a strong Russian counteroffensive pushed the German line back about 50 mi., but still left the western half of European U.S.S.R. in German hands at the end of December.

RUDOLF HESS standing beside Hitler in the Reichstag May 4, 1941, six days before the No. 3 nazi's momentous flight to Scotland



History.—Hitler's effort to destroy Britain by cutting off her overseas supplies of food and war munitions led to an intensification of the battle of the Atlantic in the spring of 1941. He sent out his newest and most powerful battleship, the 35,000-ton "Bismarck," accompanied by the cruiser "Prinz Eugen." On May 24, in the icy waters between Iceland and Greenland, they met and sank the British 42,100-ton battle-cruiser "Hood," largest warship in the world. But two days later the "Bismarck" was caught 400 mi. west of Brest and was sent to the bottom May 27, after receiving terrific punishment from British air bombs, torpedoes and direct gunfire. The "Prinz Eugen" escaped, presumably to Brest, where, along with the 26,000-ton battleships "Scharnhorst" and "Gneisenau," she was the object of repeated heavy bombings by the royal air force.

German attacks on British merchant shipping by mines, submarines, surface raiders and bombing from the air reached serious proportions in the spring of 1941, but were far less successful in the summer and autumn, owing in large part to the increased assistance given to Britain by the United States. British merchant shipping sent to the bottom during the four months March-June averaged 500,000 tons a month, according to a statement by Winston Churchill on Nov. 12, 1941. But during the following four months the losses were cut down to an average of 180,000 tons a month, and in November and December to about 100,000 tons a month.

Unable to invade or starve Britain, Hitler made three attempts in the spring of 1941 to destroy her power in the eastern Mediterranean.

In the Balkan campaign German mechanized troops suddenly attacked Yugoslavia and Greece April 6, in order to rescue the Italians who were being driven back into Albania by the Greeks and to check the British who had come to the aid of the Greeks. Yugoslav armies, greatly outnumbered, were defeated and forced to surrender April 18. Parts of their country were given to Italy, Bulgaria and Hungary; another part, the largest, was created into the German puppet state of Croatia (*q.v.*) under a former outlaw, Ante Pavelitch; the remainder was left to the Serbs. Many of the latter, however, escaped to the mountains with their weapons and in the autumn waged a very troublesome guerrilla war against the nazi troops of occupation. Greece, overrun by the end of April, was ruthlessly stripped of its food and other wealth by the nazis and then handed over to Italian occupying troops. The British, who embarked from Greece to Crete, were attacked by German parachute troops and were either killed or captured or escaped to Egypt. Thus, the Balkan campaign, the first of Hitler's three efforts, was a success; the other two were failures.

In the middle east Hitler hoped to use French Syria as a base from which to attack the British in Palestine and Egypt. He also fomented revolution in Iran and anti-British intrigues in Iraq in order to cut off British oil supplies. But the British and Free French occupied Syria in the early summer, and the intrigues in Iran and Iraq were nipped in the bud by the British, who persuaded the governments to expel the German agents.

In Libya British forces under Gen. Sir Archibald Wavell (*q.v.*) had defeated and driven the Italians out of most of the desert between Egypt and Tripoli early in 1941. Hitler, again coming to the rescue of his weak Italian ally, sent strong reinforcements to Libya under Gen. Erwin Rommel (*q.v.*). These troops recovered in April and May all the territories conquered by Gen. Wavell, shut up a British garrison in Tobruk, and even occupied coast towns within the Egyptian frontier. But in mid-November, the British, reinforced by U.S. planes and tanks, made a successful counterattack. They relieved Tobruk after its seven months'

siege, gradually reduced Rommel's German-Italian force of 150,000 men, and by the end of December had captured Bengasi and pushed more than 300 mi. west from Egypt.

Hitler's sudden invasion of the U.S.S.R. on June 22 was of momentous importance. He professedly feared that Stalin (*q.v.*) was planning to attack him, so he decided to attack first. He expected to annihilate the Russian armies in a short blitzkrieg similar to his former victories. But he had gravely miscalculated Russian power of resistance and the extent of Russian preparedness in tanks, planes and other equipment. After five months his armies did succeed in occupying all of White Russia, almost all the Ukraine and the whole of the Crimea except Sevastopol. They captured Rostov, temporarily, and partly surrounded Leningrad, but could not reach Moscow. In late November and December a powerful Russian counteroffensive drove the Germans back along their whole line reaching from the Gulf of Finland to the Sea of Azov.

By Christmas it was clear that Hitler's fundamental aim of destroying the Red armies had failed. The blitzkrieg changed into a retreat. The Germans suffered terribly from the cold, because they had not been provided with the clothing and other equipment for a long winter campaign. The appalling number of dead and wounded in battle and the suffering and loss of life from exposure to cold could not be concealed from the German people. Hitler also lost great numbers of tanks, planes and other war material in the U.S.S.R. during a precious six months in which Britain and the United States were forging ahead in their war production. On Dec. 11, following the example of Japan, Hitler declared war on the United States, thus adding to his enemies the most powerful country in the world. On Dec. 22, as a scapegoat for his own foolish Russian adventure, he dismissed Field Marshal General Walther von Brauchitsch (*q.v.*), and following his "intuitions" took over personal command of the German armies. All these events had a seriously depressing effect upon German morale. (*See* also WORLD WAR II.)

Education and Religion.—Education went through a drastic reorganization under nazi rule. The period of school attendance was shortened by one year in 1937. Many new schools were established to provide a year or two of professional or technical training; for many students this replaced the last years at the regular schools or at universities and the older technical institutes (*hochschule*). Many schools were established for training "leaders" for the nazi party and for government positions; emphasis in them is placed on comradeship, sports, nazi ideology and leadership.

Evangelical Protestants and the Roman Catholics suffered what they regarded as severe persecution under the nazi regime. The Protestant regional churches took steps in 1933 to form a single reich church in accord with Hitler's general policy of centralization. But aggressive nazis, who ordinarily seldom attended church and who indulged in semipagan views, mobilized their efforts to secure the election of Ludwig Mueller as reich bishop of the new church. This caused a split, which grew deeper and deeper, between the official Evangelical church and the really devout Christian Opposition pastors and their followers, led by Dr. Martin Niemoeller, who was placed in a concentration camp.

Pope Pius XI signed with Hitler in 1933 a concordat guaranteeing to the Roman Catholics the free exercise of their religion, their religious schools and their various religious youth, professional and charitable organizations. The guarantees were not observed. Monasteries, nunneries and church funds were confiscated by the nazis, and the Catholic clergy was restricted in preaching and teaching. With the outbreak of war in 1939 an informal truce was made between the Catholic clergy and the government, but in March, 1941, the Vatican newspaper published a protest by the archbishop of Freiburg against nazi oppression. Later the archbishop of Muenster sent a strong complaint to Hitler against Gestapo (secret police) persecution, but the complaint went unheeded.

Defense.—In March, 1935, Hitler repudiated the Versailles treaty clauses which limited Germany to a professional army (*reichswehr*) of 100,000 men, and reintroduced universal military service. In 1939 all young men ordinarily received two years of regular military training, in addition to earlier semimilitary training in the Hitler Youth (eight years) and Labour service (six months).

The approximate size of the German armed forces and the number of industrial workers at various dates is estimated in Table I (in millions of marks):

Table I.—*Armed Forces and Industrial Workers, 1939-41*

	Pre-War	Polish War	End of 1939	French War	End of 1940	Russian War	End of 1941
Armed forces*	2.5	5.0	4.0	6.5	5.5	8.0	6.9
Workers, male	15.8	13.3	14.5	12.2	13.6	12.2	12.0
Workers, female	8.1	7.9	7.6	8.3	8.4	8.5	8.6
Foreign workers	0.5	0.6	0.8	1.0	1.6	1.8	1.8
War prisoners	....	....	0.8	0.6	1.0	1.2	1.3

*Including army, navy and air forces.

It is interesting to note that the German high command and the supreme defense council seem to have acted together very efficiently in demobilizing between campaigns whatever man power could be spared for production purposes; also the steady increase in the number of German female workers, foreign workers and war prisoners.

Finance.—The unit of currency is the German mark, equivalent in U.S. money to 40.3325 cents. Its official exchange value was kept close to its U.S. and other foreign equivalents by rigid government control, but in fact there are many kinds of marks whose actual value depends on where and by whom they are used. There are also special paper "occupation marks" (*reichskassenscheine*) for the use of troops in several of the occupied lands. These have to be accepted by the local population at a rate fixed by Germany, in the U.S.S.R., for instance, at ten rubles to one reichsmark in 1941. As the official rate of exchange before the invasion of the U.S.S.R. was two rubles to one reichsmark, Germany exacted a fivefold profit in 1941. The total amount of these "occupation marks," by which the reich virtually robbed the populations it subjugated, was not divulged.

BRITISH BOMBS dropping on the Knapsack power plant near Cologne Aug. 12, 1941 during a mass daylight raid by 54 Blenheim bombers

No exact statement of German revenues and expenditures can be given, as the budget had not been published after 1935. Taxes collected by the reich central government increased more than sixfold after Hitler came to power, being about 6,000,000,000 marks for 1932–33, and officially estimated by the reich finance minister, Reinhardt, in May 1941, at 40,000,000,000 marks. The war economy decree of Sept. 4, 1939, increased the rate of taxation on many objects; the tax on corporation profits was increased 25% in Aug. 1941, and the tax on luxury articles like tobacco and champagne was considerably raised in November.

The cost of building Germany's war machine was publicly stated by Hitler on Sept. 1, 1939, to have been 90,000,000,000 marks (about

$36,000,000,000). The monthly cost of running the war machine averaged about 4,000,000,000 marks in the autumn of 1939, 5,000,000,000 in 1940, and more than 7,000,000,000 in 1941. About half the cost was met from current taxation, and the other half by government borrowing from savings banks, insurance companies and other public credit institutions. The cost of the German armies of occupation was exacted from the occupied countries in 1940 and 1941. From France, for example, 400,000,000 francs a day was exacted; but this amount in fact was much greater than the actual cost of the army of occupation and made it possible for Germany to use the surplus in buying up control of industries in France and in the Balkans.

Table II.—*Imports, Exports and Balance of Trade, 1932–39*

	Total Yearly			Monthly Average		
	Imports Million marks	Exports Million marks	Balance Million marks	Imports Million marks	Exports Million marks	Balance Million marks
1932 . . .	4,667	5,739	+1,072	389	478	+89
1933 . . .	4,204	4,871	+ 667	350	406	+56
1934 . . .	4,451	4,167	− 284	371	347	−24
1935 . . .	4,159	4,270	+ 111	347	356	+ 9
1936 . . .	4,218	4,768	+ 550	352	397	+46
1937 . . .	5,468	5,911	+ 443	456	493	+37
1938* . . .	6,052	5,620	− 432	504	468	−36
1939† . . .	2,755	2,814	+ 59	458	468	+10

*Figures do not include Austria and Sudeten area.
†Figures are for the first six months of 1939 only.

The publicly admitted reich debt more than trebled during the war, being 37,000,000,000 marks in Sept. 1939, 69,000,000,000 in Sept. 1940 and 114,000,000,000 in Sept. 1941. The 4½% rate of interest on government bonds and treasury notes during the first 18 months of the war was lowered in 1941 to 3½% on new borrowings, thus considerably reducing the cost of the debt.

The reichsbank's gold reserve (including foreign exchange reserves), which was about 4,000,000,000 marks in 1932, had shrunk by Nov. 29, 1941, to 77,179,000 marks. It afforded a coverage of only 0.43% for the paper money in circulation, as compared with a 24.3% coverage in 1932, and with the 40% coverage which before World War I was considered the lowest coverage compatible with safety. The reichsbank's paper note circulation on Nov. 29, 1941, was the largest in its history since the reorganization of the bank in 1924, being 17,792,897,000 marks as compared with the circulation at the end of preceding years: 8,222,000,000 (1938), 11,798,000,000 (1939) and 14,033,000,000 (1940). This increase in paper money and government borrowing and spending would normally tend toward an inflation of prices and a rise in the cost of living, but the government by very rigid control of prices and wages managed to keep the price level close to what it was at the outbreak of the war in 1939. The cost of living index, according to official announcement, rose only from 131.6 in Sept. 1940 to 133.3 in Sept. 1941. The share price index on the Berlin stock market, however, rose from 133.05 in Aug. 1939 to 217.20 in Aug. 1941, and the bond index from 101.26 to 107.20.

Trade and Communication.—After 1935, Germany's exports and imports were very strictly controlled, first by Dr. Schacht's "new system," then by Goering's dictatorial economic power as commissioner for the four-year plan, and finally by the ministerial council for reich defense, established by Hitler on Aug. 30, 1939, and headed by Goering with sweeping powers to co-ordinate economic and administrative activity. Germany's imports and exports and resulting balance of trade during the years 1932–39 are shown in Table II.

The figures show that the imports tended to increase, especially in 1937 and 1938, while the exports increased less, with the result that the balance of trade became less favourable. Among the reasons for this is the fact that Germany increased its imports of raw materials for its rapidly growing armaments, and to some extent its imports of food for its people and fodder for its cattle. The figures do not include the exports and imports of the annexed Austrian and Sudeten territories. If they did so, the deficit in the trade balance would have been greater in 1938, since Austria and the Sudeten territories have always had to import a larger proportion of their food than has Germany; as far as Germany's food problem went, these two territories were a liability rather than an asset.

"OPTIMISTIC STRONG MAN." Mahon's appraisal, in the *Philadelphia Evening Bulletin*, of the task Hitler set for himself June 22, 1941, when he attacked the U.S.S.R.

With the outbreak of war, Germany ceased publishing official statistics so that no exact trade figures were available for 1940–41. From other sources, however, it is clear that Germany was at once cut off from almost all its overseas trade and thus deprived of half of its normal foreign commerce. To compensate for this loss it sought to intensify its trade with its immediate continental neighbours by trade agreements to get food, fodder, iron ore, bauxite, petroleum products and other war materials, in exchange for German coal, machinery and manufactured goods. By its much-advertised "new order" in Europe it also sought to make Berlin, as much as possible, the trading centre for continental Europe by making its neighbours clear their trade accounts in marks through Berlin as a clearing centre instead of settling their accounts directly with one another.

Enemy countries and neutrals had accounted before the war for a large proportion of the reich's imports of strategic raw materials—98.5% of the cotton, 87.7% of the copper, all the rubber and 44.1% of the iron ore. Gasoline and lubricants continued during 1940–41 to be one of the reich's most serious needs, since the annual domestic production of 4,000,000 tons of synthetic gasoline, plus imports from Rumania and the U.S.S.R., hardly sufficed to meet German industrial and war demands. The conquest of Yugoslavia and Greece in April 1941 increased somewhat Germany's supply of food, bauxite, copper and other raw materials. But the invasion of the U.S.S.R. in June cut off all deliveries from that country, and yielded little booty because Stalin's "scorched earth" policy destroyed or removed food, raw materials, rolling stock and factories from the grasp of the advancing German armies.

The German state railway (*reichsbahn*) included in 1938, prior to the annexation of Austria and other lands, 53,330 km. (33,076 mi.) of standard-gauge lines and 879 km. (546 mi.) of narrow-gauge lines. Privately owned lines included 3,732 km. (2,313 mi.) of standard and 752 km. (476 mi.) of narrow gauge. Owing to Hitler's great efforts at rearmament and public works, the railways were not kept up in proper repair with adequate replacement of roadbed and rolling stock. As a result the railways had difficulty in meeting the added strain of war. This was particularly true in the case of hauling oil in tank cars from Rumania and in making coal deliveries to Switzerland, Italy and throughout the reich during 1940–41, and especially true after the Russian invasion added 30,000 km. of railway without any corresponding increase of locomotives and rolling stock.

By the middle of 1939 Germany had completed and opened to traffic 3,065 km. of the new automobile highway network (*reichsautobahn*); 1,383 km. were under construction and preliminary work was proceeding on 2,449 km. The outbreak of war compelled Germany to cut this building program by half. Work was continued only on those stretches which were of greatest strategic or economic importance, particularly in linking Germany with its newly acquired territories in the east. The volume of motor traffic was also sharply curtailed for the duration of the war in order to economize on gasoline. The number of private autos in circulation was cut to 15% of the prewar total. Many trucks were converted to use methane or butane gas instead of gasoline as a motor fuel.

German inland shipping at the beginning of the war included 5,373 vessels moving under their own power and totalling 528,000 tons; and 12,488 canal boats and other vessels without power, totalling 5,835,000 tons. High seas shipping included 3,579 vessels with a total registered net

"INFERIOR DECORATION." An English cartoonist's idea, in the *Daily Dispatch* (Manchester), of Paperhanger Hitler's "new order" for Europe in 1941

tonnage of 2,238,000. During the war, aside from trade in the Baltic, German ocean-going vessels were mostly kept tied up in home ports or in neutral ports abroad. Some vessels which were caught by the British at the beginning of the war or which tried to return home, like the luxury liner "Columbus," were sunk or captured by the British or scuttled by their own crews.

Agriculture, Manufactures, Mineral Production.—Germany's agricultural production in the prewar years in thousands of metric tons was as shown in Table III. The potato harvest of Greater Germany (including Austria

Table III.—*Agricultural Production from 1932 to 1939*
(In thousands of metric tons)

	Rye	Wheat	Barley	Oats	Potatoes	Sugar Beets	Fodder Beets
1932 . . .	8,363	5,003	3,214	6,650	47,016	7,875	34,486
1933 . . .	8,727	5,604	3,468	6,952	44,071	8,578	30,716
1934 . . .	7,607	4,532	3,203	5,452	46,780	10,394	33,804
1935 . . .	7,478	4,667	3,387	5,385	41,015	10,567	34,711
1936 . . .	7,386	4,426	3,390	5,618	46,323	12,095	37,826
1937 . . .	6,920	4,580	3,640	5,920	53,600	15,701	40,538
1938 . . .	8,493	5,502	4,177	6,274	48,700	17,200	41,700
1939* . . .	—	—	—	—	54,540	17,400	39,500

*Figures for 1939 are estimated. The total grain harvest was estimated at 27,430,000 metric tons, *i.e.*, 6.4% more than the total for 1938.

and Bohemia-Moravia) was good (70,000,000 metric tons) in 1940, but poor (65,000,000 tons) in 1941, so that in Nov. 1941, potatoes for the first time had to be rationed.

The latest available figures (in 1941) for Germany's mineral and manufactured products, in metric tons, are shown in Table IV.

Table IV.—*Production of Minerals and Manufactured Products, 1933–37*
(In metric tons)

	1933	1934	1935	1936	1937
Coal . . .	109,532,600	125,405,600	143,491,300	159,756,600	184,500,000
Lignite . .	126,756,600	137,223,400	147,162,100	161,426,900	184,700,000
Iron ore . .	2,592,000	4,343,000	6,044,000	7,570,000	9,792,000
Lead . . .	91,000	98,400	122,300	139,000	158,500
Zinc . . .	162,000	212,800	205,000	207,700	194,300
Rock salt .	1,841,300	2,024,200	2,077,200	2,383,800	2,767,000
Potash . .	7,362,800	9,616,700	11,672,500	11,764,600	14,400,000
Pig iron . .	5,246,500	8,716,700	12,846,200	15,302,500	15,960,000
Steel . . .	7,303,200	11,601,700	16,013,500	18,590,900	19,387,000

As a result of Germany's conquest of the resources of Austria, Czechoslovakia, western Poland, Belgium, northern France, Yugoslavia and parts of western U.S.S.R., its mineral and manufacturing products were greatly increased, but they mostly had to be devoted to war purposes. Increased capital and labour were devoted to the production of substitute (*ersatz*) products—synthetic gasoline, rubber, soap, textiles, plastics—in place of imported goods or goods made from imported raw materials. Many of these substitutes were fairly satisfactory, but they required more labour and cost more than the old natural products. Even before the war, Germany suffered from a labour shortage which became more serious with the mobilization of men into the army. The labour shortage in 1940–41 was partly met by bringing in large numbers of captured Poles, Belgians, Dutch, Serbs and Russians to work in German fields or factories; French prisoners, who numbered nearly 2,000,000, were also in many cases set to work. Some 70,000 Italians went to work in the reich.

(*See* also AIR FORCES OF THE WORLD; ANTI-SEMITISM; ARMIES OF THE WORLD; BOHEMIA AND MORAVIA; CZECHOSLOVAKIA; EDUCATION: *General World Movements;* FASCISM; PROPAGANDA; RELIGION; ROMAN CATHOLIC CHURCH; RUTHENIA; SLOVAKIA; UNITED STATES; WORLD WAR II; YOUTH MOVEMENTS.

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Gibraltar: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Gilbert and Ellice Islands Colony: *see* PACIFIC ISLANDS, BRITISH.

Ginger: *see* SPICES.

Girl Scouts. Members of all ages were active in defense work of all kinds, but to fill a special need for older girls, the Senior Service Scout program of civilian defense activities was launched in the fall of 1941. Senior high school girls were required to pass stiff tests before they were qualified to wear the triple S insignia. They then might specialize in one of four fields: foods; child care; transportation and communication; clothing, shelter and recreation.

Contributions to the Juliette Low memorial fund, set up in memory of the founder of girl scouting in the United States to promote understanding among girls of all nations, reached an all-time high. Part of the money was used for the relief of guides and scouts of war-torn lands, especially China, Britain and refugee guides in Britain. Part was used to finance the second western hemisphere encampment to foster friendship among the girls of the Americas. One hundred sixty American girls were hostesses to delegates from Argentina, Barbados, Bermuda, Brazil, British Guiana, British Honduras, Canada, Cuba, Guatemala, Jamaica, Mexico, Newfoundland, Puerto Rico, Trinidad and the Virgin Islands. As a result of suggestions made by the girls themselves, a third encampment was planned for 1942.

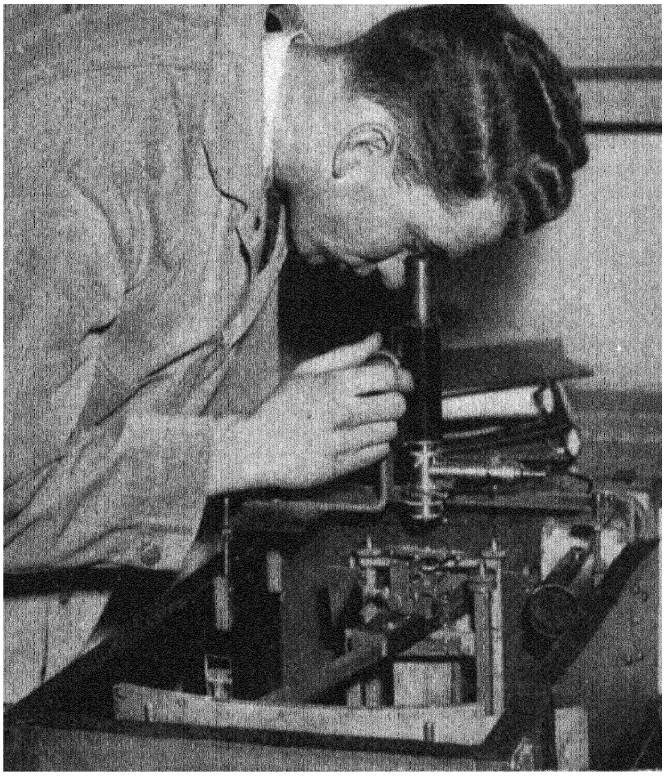
In 1941 there were approximately 670,000 members of the Girl Scout organization in the United States. Of these, more than 100,000 were adults, the rest, girls ranging in age from seven to eighteen. (C. M. R.)

Glands: *see* ENDOCRINOLOGY; MEDICINE.

Glass. The year 1941 was one of great activity in the American glass industry. Production reached the highest value in history, approaching $440,000,000. Almost all lines of glassware shared the increased demand arising from higher national income, but the greatest gain was made by window glass, as a result of new construction in connection with preparation for war. More than 16,000,000 boxes (800,000,000 sq.ft.) of window glass were produced.

Plate glass output, curtailed somewhat in the latter part of the year by reduced production of automobiles, amounted to 190,000,000 sq.ft. Small volume was anticipated for 1942, because no private cars would be made, and few buildings requiring plate glass would be constructed.

Nearly 10,000,000,000 bottles and containers were made. Part of these were needed to offset the shortage of tin and other materials used in metal and paper containers. Statistics were not available for illuminating glassware and pressed and blown ware, but these branches of the industry enjoyed unusual prosperity. Optical glass, because of the military demand, showed large gains in volume of production and in plant capacity.



MEASU[illegible] TEXTURE of [illegible] at the Mellon Institute of Industrial Research, Pittsburgh, Pennsylvania

Fibre glass, glass blocks, cellular glass in blocks for insulating purposes, fluoride films on lens surfaces to diminish reflection, and lightweight bottles were among new items manufactured in larger quantity. Growing demand for fluorescent lighting units resulted in the establishment of new plants for making the necessary tubing. The commercial production of ground and polished plate glass, coloured and only 3/4-in. thick, for use in goggles and as laminated windows for aeroplanes, was an outstanding achievement of the year.

The effect of World War II on the glass industry in America appeared in the statistics, and was reflected in the scarcity of certain glassmaking chemicals, notably soda ash, cryolite and metallic oxides used in colouring.

Research and Invention.—Research and invention continued, with 329 U.S. patents relating to glass and its manufacture issued during 1941. The government's anti-patent-monopoly suit was still far from a decision, after reams of testimony had been heard. New silica-free glasses of high refractive index, invented by G. W. Morey, came into lens production. Fabrics woven from glass threads replaced other cloths for certain technical and military purposes. (S. R. S.)

Gliding. The most important development in motorless flying in 1941 was the military use of large troop-carrying gliders. Following their successful employment for surprise attack by the Germans in Belgium and Crete, new designs were started by the U.S. army and navy. These craft were planned to carry from 8 to 24 fully equipped soldiers and the larger types to have a wing span of more than 100 ft. Several were planned to be towed behind a single transport or bombing plane, and this would probably lead to commercial application for air transport.

Training of army air corps pilots in glider flying was begun at Elmira, N.Y. following the conclusion of the 12th annual National Soaring contest in July. John Robinson, who again won the national championship, became chief instructor of the school, which was operated by the Elmira Area Soaring corporation. Marine corps pilots were being trained at the Frankfort-Lewis School of Soaring at Joliet, Ill. and the Motorless Flight institute, Chicago Heights, Ill. Another school for civil instruction was the Briegleb Soaring school, Van Nuys, Calif.

Parker Leonard, newly elected president of the Soaring Society of America, reported that there was a marked increase in public interest and participation in the sport of gliding and soaring during the year. Many of the pilots and builders were employed in the factories and schools. (L. B. Ba.)

G-Men: *see* Federal Bureau of Investigation.

Goering, Hermann Wilhelm (1893–), German reichsmarshal and statesman, was born at Rosenheim, Bavaria, on Jan. 12 and was commander of the famed Richthofen squadron in the German air force during World War I after Richthofen's death. Goering was an early member of the nazi party and became air minister and minister of the interior in 1933 upon Hitler's accession to the chancellorship. (See *Encyclopædia Britannica.*) On July 19, 1940 Hitler conferred the newly created title of marshal of the reich on Goering and declared before the reichstag that his aide, as creator of the German air force, "has individually made the highest contribution to the reconstruction of the German army." Goering, appointed head of the economics general staff on Jan. 4, 1940, had supreme control over Germany's economic life.

As usual, Goering spent much time in 1941 at the various fighting fronts; in addition, he took over some of the diplomatic duties formerly reserved to Hitler and Ribbentrop (*qq.v.*). On March 5, in a conference with Ion Antonescu (*q.v.*) at Vienna, he secured for Germany the right to overrule all Rumanian economic pacts with other countries. On Dec. 1 he met with Marshal Pétain (*q.v.*) at St. Florentin in occupied France, to confer on French collaboration with Berlin. Despite many rumours of a rift with Hitler, Goering continued to direct the *Luftwaffe* in 1941.

Gold. A turning was at last reached in 1941 in the long lane down which gold had been moving for more than seven years. Ever since the devaluation of the dollar in Jan. 1934, gold had been moving toward the United States. A variety of influences conspired to heap gold on the United States in an unprecedentedly mountainous pile. Gold arrived because the dollar was priced too cheaply by government action in 1934. Gold arrived because European nationals were fearful, in the years before Sept. 1939, of a conflagration in Europe. Gold streamed in because governments in Europe sought to place their metallic reserves beyond a conqueror's grasp, and because the Japanese government required dollars to buy materials for the war for which it was so strenuously preparing. Latterly, gold flowed to the United States in a swollen torrent to provide purchasing power for the British empire in its struggle with the axis powers.

These mighty forces, which in seven years had swept $16,000,000,000 of gold to the United States, spent themselves abruptly in the late spring of 1941. Slowly opposing influences took shape and gained momentum, and finally, as the year drew to a close, the flow of gold turned outward from the United States. The losses of the metal which the United States experienced were on a scale greatly reduced from the vastness of the preceding inflow. Nevertheless, it was recorded that the gold stock of the United States showed a net decline in November—the first month since Feb. 1933, just before the banking holiday, in which the United States sold to foreign countries more gold than it bought from them and from its own domestic mines.

In five of the last nine weeks of 1941 the United States lost gold on balance, and the trend carried over into the early weeks of 1942. For the year as a whole the gold reserve of the United States expanded $741,000,000 net to a total of $22,736,000,000. But the rise was noticeably the smallest for any year since 1934. It compared with a net increase in the gold stock of $4,351,000,000 in 1940, $3,132,000,000 in 1939, $1,751,000,000 in 1938 and $1,502,000,000 in 1937. In contrast to these huge increases the net shrinkage of $60,000,000 in the gold stock in the concluding nine weeks of 1941 seemed trivial.

In considering the break which the gold movement made in 1941 with its recent past, a beginning may be made by noting the exhaustion of those forces which brought gold to the United States in the years after 1933 in unparalleled volume. The mastery which Germany gained of the European continent prevented the continuance of the flow of refugee gold to the United States. Fears by Japan that the United States would "freeze" its balances—fears that were borne out in July—brought to a halt the shipments of gold eastward across the Pacific. The "freezing" regulations made it impossible for several of the occupied European nations to sell any large amount of the gold which they had under earmark at the Federal Reserve Bank of New York.

Most important of all, though, was the virtual exhaustion of the gold resources of the United Kingdom. In a letter dated Jan. 21, 1941, Secretary of the Treasury Henry Morgenthau, Jr., disclosed official British figures showing a decline of $2,316,000,000 in the gold and dollar resources of the United Kingdom in the first 16 months of the war. These official estimates placed the British gold holdings at $2,038,000,000 on Aug. 31, 1939, the day before Germany invaded Poland. By Dec. 31, 1940, the British gold stock had fallen by $1,746,000,000 to a net available sum of

$241,000,000, which was considered the minimum amount necessary for the British central banking and currency reserves.

With the virtual depletion of the British gold reserve, the United States government took a step of great significance, considered purely on the ground of international capital movements. The Lend-Lease act became law in March 1941, providing for dollar advances by the United States treasury to cover debts thenceforth contracted by Britain, as well as other countries resisting the axis if they needed dollars, in the purchase of war materials in the United States. The importance of this move was not confined to the sphere of the war. Economically, it meant that the United States was, after an interval of years, making foreign loans or their equivalent. The retirement of the United States as a foreign lender ten years before had left the favourable balance of payments of the country an unrelieved drain on the gold reserves of the rest of the world. The privileges of the Lend-Lease act were widely availed of, and by its workings the United States exported goods without receiving gold in exchange.

In still another way did the United States lend dollar resources to foreign nations. Through the Export-Import bank of Washington, a government institution, large sums were placed at the disposal of Latin-American countries, and the dollar resources of these western hemisphere nations were still further augmented by the large-scale purchasing of their commodities by the United States. It was these same Latin-American nations which were thereby enabled to reverse the gold flow which had been running so heavily and without a break to the United States for years. They began converting a portion of their swollen supply of dollar balances into gold and placing the gold under earmark to their account in the United States. Largely because of their buying, the quantity of gold under earmark at New York increased $307,900,000 in the first 11 months of 1941 to the highest level on record at $2,115,600,000.

It is not possible to set the gold movement story down in the accustomed detail for 1941 because the war led to a suspension of gold statistics by the U.S. department of commerce. In May 1941 the department of commerce discontinued publication of gold export statistics by country of destination. Following the Japanese attack on Pearl Harbor on Dec. 7, the department suspended publication of gold import and export statistics by months. The table gives the gold import figures for all of 1940 and the first ten months of 1941.

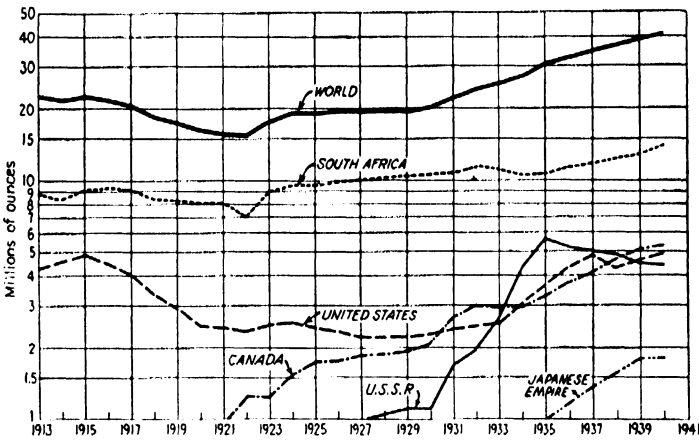
Gold Receipts of the U.S., 1941 and 1940
(000's omitted)

	1941*	1940		1941*	1940
Total	$879,163	$4,749,467	Norway	$.....	$ 33,405
Canada	366,793	2,622,501	U.S.S.R.	25,844	30,851
United Kingdom	3,495	633,100	South Africa	292,663	184,756
France	1	241,778	Japan	9,444	111,739
Sweden	1,747	161,489	Australia	57,798	103,777
Switzerland	899	90,320	British India	8,954	49,089
Portugal	354	75,087	Philippines	35,346	38,630
Netherlands	.....	63,260	Argentina	160	59,072
Italy	.....	43,935	Colombia	20,100	23,000

*Ten months.

With the spread of the war over the entire world, the shipments of gold across the oceans which mark times of peace were all but ended. Perhaps never were foreign exchange dealings so completely at a standstill. As the year closed the gold standard was in low estate, its usefulness as a medium for settling international balances confined almost entirely to transactions between Latin America and the United States. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES. (E. H. Co.)

Production.—Although there had been no suppression of statistics on gold production because of the war, the general slowing down of the distribution of data left only scanty information. The 1940 world total was estimated at 41,000,000 oz., and this



GOLD PRODUCTION: world total and output of the principal producing countries *(The Mineral Industry)*

was expected to increase in 1941, as it had in every year since 1932.

The only information available on South Africa, the leading producer, was that the 1940 total of 14,047,000 oz. would be surpassed in 1941.

In the United States, gold production increased by 5% in 1940 to 5,984,163 oz. for mine production, and 6,003,105 oz. for refinery production, a 7% increase. The usual monthly figures were lacking for 1941, but preliminary estimates indicated an increase of about 10% over 1940.

Canadian production to the end of Oct. 1941 was 4,466,373 oz., against 4,409,571 oz. in the same period of 1940, and 5,322,857 oz. for the full year of 1940.

Mexico reported 431,900 oz. for the first half of 1941, as compared with 883,124 oz. in the full year of 1940.

The price of gold remained unchanged throughout the year, at $35.00 in the United States and 168*s.* in Great Britain. (*See* also FEDERAL RESERVE SYSTEM; MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. Ro.)

Gold Coast: *see* BRITISH WEST AFRICA.

Gold Standard: *see* GOLD.

Golf. Individual players of national standing entered the military service, including among others Charlie Yates of Atlanta, former holder of the British amateur championship, and Ed Oliver, young Delaware professional, who achieved considerable notice during 1940 by equalling the score at which Gene Sarazen and Lawson Little tied for the Open Championship, only to be disqualified for starting his last round before his scheduled starting time.

Important titular competitions for the year saw honours distributed equally between representatives of the Pacific and Atlantic coast regions, to the exclusion of the midland sections.

Marvin "Bud" Ward of Spokane, Wash., regained the amateur championship, which he had previously won in 1939, in the annual tournament held at the Omaha Field club. In the final match he defeated another Pacific coast player, Pat Abbott of California. The tournament was marked by the heavy toll of well-known players eliminated in the first two rounds of matches, each at 18 holes. Among those beaten were defending champion Richard Chapman and former champions Johnny Fischer and Johnny Goodman. The latter, a popular favourite with Omaha galleryites, was eliminated by Bobby Riegel, a little-known player. Goodman's experience was in a way a re-enactment of the experience of Robert T. Jones, whom Goodman defeated in the first round of the 1929 championship, to become nationally known overnight.

Mrs. Frank Newell, formerly Miss Elizabeth Hicks, of Long Beach, Calif., won the women's championship, played over the course of the famous country club of Brookline near Boston, Mass., defeating Helen Sigel of Philadelphia, Pa., in the final match. Mrs. Newell is the first representative of the Pacific coast to win this title. Combined with the triumph of Ward, her victory gave that section its first double victory in the important national championships.

Scarcely more than two months after winning the title, Mrs. Newell announced that she was giving up her amateur status, and entered the shop of a Long Beach professional to begin her apprenticeship toward becoming a professional teacher of the game.

In the professional field, Craig Wood, representing the Winged Foot Golf club of New York, won the open championship, played over the course of the Colonial club of Fort Worth, Tex. His winning total was 284. Victor Ghezzi of the Deal Golf club on the New Jersey coast, won the Professional Golfers' association championship, over the course of the Cherry Hill club of Denver, Colo. In the final he defeated Byron Nelson in an extra-hole match. The triumph was the most notable in the career of the New Jersey player.

Considering the ill fortune which had attended him in previous important competitions over a period of several years, the victory of Wood was possibly the most popular with golfers throughout the country since the completion of the famous "grand slam" by Robert T. Jones in 1930.

Twice before Wood had tied for national Open titles. First in 1933, when he finished even with Densmore Shute in the British Open, and lost in the play-off. Again in the 1939 U.S. Open, when he finished in a three-way tie with Shute and Byron Nelson. Nelson won that play-off. Further in the 1934 Professional Championship, Wood and Paul Runyan were even at the end of 36 holes in the final match. Runyan won at the second extra hole.

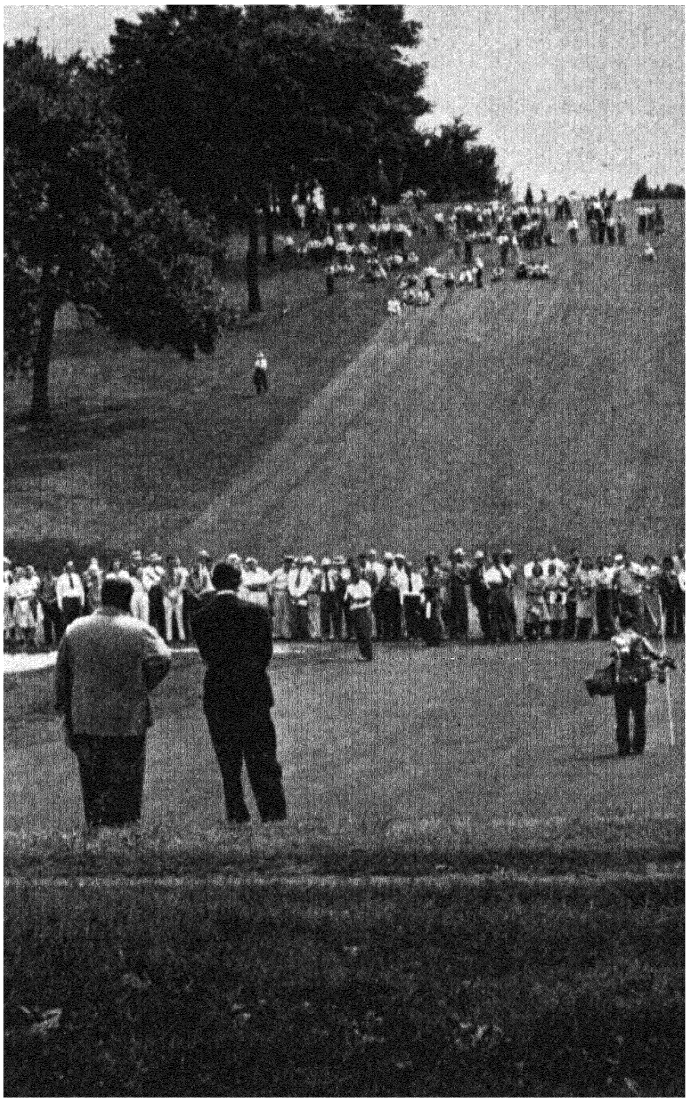
Wood enjoys the distinction of being the oldest native-born player ever to win this championship. He was a matter of some five months short of his 40th birthday when he won. Ted Ray, who won at the age of 44, is the oldest ever to win.

International relations with European golf were wholly blotted out by the war. At the same time, relations with golfers in South America continued to be fostered. Following the precedent of other professionals in earlier years, Sam Snead and Jimmy Demaret visited Argentina, where they took part in a number of special matches. Demaret won the Argentine Open championship. Both were highly pleased with the cordial reception given them. Meantime, Mario Gonzalez, a fine young amateur player from São Paulo, Brazil, took part in the United States amateur championship and drew the plaudits of observers for his skilful play and engaging personality.

The year marked the 20th playing of the Public Links championship, over the Indian Canyon public course of Spokane, Wash. No more fitting proof of the popularization of the game throughout the country, than the growth of this event, can be cited. The championship was inaugurated at Toledo, Ohio, in 1922. There were 138 entries. This year's event attracted a total of 2,816, who engaged in sectional elimination contests in more than 30 cities.

This was by far the largest entry ever recorded in a national championship. William Welch, employee of an oil company in Houston, Tex., won the championship. In the final match he defeated John J. Kern, a Denver insurance man.

Another record was established in the total or prize money offered for competition by professional players, when purses passed the $200,000 mark. Approximately half of this was distributed among contenders in events of the winter season. This begins around the middle of December and ends at mid-April.



SPECTATORS at the 1941 national amateur golf tournament in Omaha, Neb. were reprimanded for poor sportsmanship in showing their hostility to the winner, Marvin Ward of Spokane. In the photograph the crowd watches an early contestant send a long putt to the pin

This development has been achieved largely by the efforts of the tournament bureau of the Professional Golfers' association.

Incidental to tournament earnings, Ben Hogan, professional at the Hershey country club at Hershey, Pa., repeated his performance in 1940 in leading all rivals. His total from purses exceeded $17,000. In the Hurst tournament at Philadelphia, Pa., which ended Sept. 21, Hogan failed to finish among the money-winners for the first time through 57 consecutive starts.

Five additional nominations for golf's hall of fame were elected. They are: Charles "Chick" Evans, and Jerome D. Travers, both former winners of the U.S. Amateur and U.S. Open championships, J. J. McDermott, first American-born professional to win the U.S. Open championship (1911), and Alex Smith and Willie Anderson, both Scottish-born professionals, who won the U.S. Open championship two or more times.

Under the sponsorship of the Professional Golfers' association, plans for the hall of fame contemplated the creation of a shrine of golf at the Augusta National Golf club at Augusta, Ga. Four players were named in the original selection, Robert T. Jones, Francis Ouimet, Walter Hagen and Gene Sarazen. A trio of veteran golf writers, Grantland Rice of New York, O. B. Keeler of Atlanta, Ga., and A. Linde Fowler of Boston, Mass., constitute the committee on nominations.

In keeping with the efforts of sports generally, golf made a considerable contribution to the different campaigns for raising funds for patriotic purposes. Scores of well-known players, both amateur and professional, participated in this work. Notable was

a special three-round match, staged in Boston, New York and Detroit, between two of the most famous of all baseball players, who have taken enthusiastically to golf in recent years, Tyrus Raymond Cobb, and George Herman "Babe" Ruth. Cobb emerged the winner of this interesting match, by a small margin.

Following the declaration of war, action by the federal government, looking toward the conservation of rubber, imposed gross curtailment in the manufacture of balls for the duration of the war. (I. Bn.)

Gonads: *see* Endocrinology.

Gonorrhoea: *see* Venereal Diseases.

Göring, Hermann Wilhelm: *see* Goering, Hermann Wilhelm.

Government Departments and Bureaus.

The following are the leading officers of the more important government departments and bureaus of the United States. The date for the information is Jan. 1942.

Department or Bureau	*Name*	*Post*
Department of State	*Hull, Cordell	Secretary
	*Welles, Sumner	Under-Sec'y
Department of the Treasury	Morgenthau, Henry, Jr.	Secretary
	Bell, Daniel W.	Under-Sec'y
Bureau of Comptroller of Currency	Delano, Preston	Comptroller
Treasurer of the U.S.	Julian, William A.	Treasurer
Bureau of Customs	Johnson, W. R.	Commissioner
Bureau of Internal Revenue	Helvering, Guy T.	Commissioner
War Department	*Stimson, Henry L.	Secretary
	Patterson, Robert P.	Under-Sec'y
Chief of Staff	*Marshall, George C., Gen.	Chief of Staff
Office of the Adjutant General	Adams, E. S., Maj. Gen.	Adjt. General
Office of the Chief of Engineers	Reybold, Eugene, Brig. Gen.	Chief
The Army Air Forces	*Arnold, H. H., Maj. Gen.	Chief
Department of Justice	*Biddle, Francis	Att'y-Gen.
Solicitor General	Fahy, Charles	Solic. Gen.
*Federal Bureau of Investigation	Hoover, J. Edgar	Director
Bureau of Prisons	Bennett, James V.	Director
Immigration and Naturalization Service	(Vacancy)	Commissioner
*Post Office Department	Walker, Frank C.	Postm'r Gen.
Department of the Navy	*Knox, Frank	Secretary
	Forrestal, J. V.	Under-Sec'y
Office of Chief of Naval Operations	*Stark, H. R., Adm.	Chief
Bureau of Navigation	Jacobs, Randall, Rear Adm.	Chief
Bureau of Ordnance	Blandy, W. H. P., Rear Adm.	Chief
*U.S. Marine Corps Headquarters	Holcomb, Thomas, Maj. Gen.	Commandant
*U.S. Coast Guard	Waesche, Russell R., Rear Adm.	Commandant
Department of the Interior	Ickes, Harold L.	Secretary
	Dempsey, John J.	Under-Sec'y
General Land Office	Johnson, Fred W.	Commissioner
Office of Indian Affairs	Collier, John	Commissioner
Geological Survey	Mendenhall, W. C.	Director
*Fish and Wild Life Service	Gabrielson, Ira N.	Director
Bureau of Reclamation	Page, John C.	Commissioner
*National Park Service	Drury, Newton B.	Director
Bureau of Mines	Sayers, R. R.	Director
Division of Territories and Island Possessions	Swope, Guy J.	Director
Department of Agriculture	*Wickard, Claude R.	Secretary
	Appleby, Paul H.	Under-Sec'y
Bureau of Agricultural Economics	Tolley, Howard R.	Chief
Agricultural Marketing	Hendrickson, Roy F.	Administrator
Surplus Marketing Administration	Gaumnitz, E. W.	Administrator
Commodity Exchange Administration	Mehl, Joseph M.	Chief
Agricultural Marketing Service	Kitchen, Clarence W.	Chief
Agricultural Adjustment and Conservation	Evans, R. M.	Administrator
Agricultural Adjustment Administration	Wallace, Fred S.	Administrator
*Soil Conservation Service	Bennett, Hugh H.	Chief
Federal Crop Insurance Corporation	Smith, Leroy K.	Manager
Sugar Division	Bernhardt, Joshua	Chief
Agricultural Research	Auchter, E. C.	Administrator
Bureau of Animal Industry	Mohler, John R.	Chief
*Bureau of Agricultural Chemistry and Engineering	Knight, Henry G.	Chief
Bureau of Dairy Industry	Reed, Ollie E.	Chief
Bureau of Entomology and Plant Quarantine	Annand, P. N.	Chief
Office of Experiment Stations	Jardine, James T.	Chief
Bureau of Plant Industry	Auchter, E. C.	Chief
Bureau of Home Economics	Stanley, Louise	Chief
*Commodity Credit Corporation	Hutson, J. B.	President
Farm Security Administration	Baldwin, C. B.	Administrator
Farm Credit Administration	Black, Albert G.	Governor
*Forest Service	Clapp, Earle H.	Acting Chief
*Rural Electrification Administration	Slattery, Harry	Administrator
Department of Commerce	*Jones, Jesse H.	Secretary
	Taylor, Wayne C.	Under-Sec'y
*Bureau of the Census	Capt, James C.	Director
Bureau of Foreign and Domestic Commerce	Wilson, Carroll L.	Director
*National Bureau of Standards	Briggs, Lyman J.	Director
*Coast and Geodetic Survey	Colbert, Leo O.	Director
Civil Aeronautics Board	Branch, Harllee	Chairman
Bureau of Marine Inspection and Navigation	Field, R. S.	Director
*Patent Office	Coe, Conway P.	Commissioner
Weather Bureau	Reichelderfer, F. W.	Chief
Department of Labor	Perkins, Frances	Secretary
	Tracy, D. W.	Asst. Sec'y
U.S. Conciliation Service	Steelman, J. R.	Director
Bureau of Labor Statistics	Lubin, Isador	Commissioner
Children's Bureau	Lenroot, Katharine F.	Chief
Women's Bureau	Anderson, Mary	Chief
Wage and Hour Division	Holland, Thomas	Administrator
Federal Security Agency	McNutt, Paul V.	Administrator
*Civilian Conservation Corps	McEntee, J. J.	Director
*National Youth Administration	Williams, Aubrey	Administrator
Office of Education	Studebaker, John W.	Commissioner
*Public Health Service	Parran, Thomas	Surgeon Gen.
*Social Security Board	Altmeyer, Arthur J.	Chairman
Food and Drug Administration	Campbell, W. G.	Commissioner
*Federal Works Agency	Fleming, Philip B., Brig. Gen.	Administrator
Public Buildings Administration	Reynolds, W. E.	Commissioner
Public Roads Administration	MacDonald, Thomas H.	Commissioner
Public Works Administration	Gilmore, M. E.	Commissioner
U.S. Housing Authority	Keyserling, Leon H.	Acting Administrator
Work Projects Administration	Hunter, Howard O.	Commissioner
Federal Loan Agency	*Jones, Jesse H.	Administrator
Electric Home and Farm Authority	Hobson, A. T.	President
*Export-Import Bank of Washington	Pierson, Warren L.	President
*Federal Home Loan Bank Board	Fahey, John H.	Chairman
*Home Owners' Loan Corporation	Cotter, Charles F.	Gen. Mgr.
*Federal Housing Administration	Ferguson, A. H.	Administrator
*Reconstruction Finance Corporation	Henderson, Charles B	Chairman
Independent Offices		
*U.S. Civil Service Commission	Mitchell, Harry B.	President
*Interstate Commerce Commission	Eastman, Joseph B.	Chairman
*Federal Reserve System, Board of Governors	Eccles, Marriner S.	Chairman
Federal Trade Commission	Ayres, William A.	Chairman
U.S. Tariff Commission	Stevens, Raymond B.	Chairman
U.S. Board of Tax Appeals	Murdock, J. Edgar	Chairman
Federal Power Commission	Olds, Leland	Chairman
*Veterans Administration	Hines, F. T., Brig. Gen.	Administrator
*Smithsonian Institution	Abbot, C. G.	Secretary
*Pan American Union	Rowe, L. S.	Director Gen.
*American National Red Cross	Davis, Norman H.	Chairman
*Tennessee Valley Authority	Lilienthal, David E.	Chairman
*Federal Deposit Insurance Corporation	Crowley, Leo T.	Chairman
*Securities and Exchange Commission	Eicher, Edward C.	Chairman
*The National Archives	Buck, Solon J.	Archivist
*National Labor Relations Board	Millis, Harry Alvin	Chairman
*Federal Communications Commission	Fly, James L.	Chairman
*Government Printing Office	Giegengack, A. E.	Public Printer
General Accounting Office	Warren, Lindsay C	Comptroller General
National Advisory Committee for Aeronautics	Hunsaker, Dr. Jerome C.	Chairman
National Capital Park and Planning Commission	Delano, Frederic A.	Chairman
National Mediation Board	Lewis, David J.	Chairman
Railroad Retirement Board	Latimer, Murray W.	Chairman
U.S. Employees' Compensation Commission	Swofford, Mrs. Jewell W.	Chairman
U.S. Maritime Commission	Land, E. S., Rear Adm.	Chairman
Maritime Labor Board	Bruère, Robert W.	Chairman
Executive Office of the President		
Bureau of the Budget	Smith, Harold D	Director
National Resources Planning Board	Delano, Frederic A.	Chairman
Office of Government Reports	Mellett, Lowell	Director
National Defense and War Agencies		
*Office for Emergency Management	Coy, Wayne	Liaison Officer
*Office of Civilian Defense	*La Guardia, F. H.	Director
*Office of Lend-Lease Administration	*Stettinius, E. R., Jr.	Administrator
*Defense Communications Board	Fly, James L.	Chairman
Office of Defense Health and Welfare Services	McNutt, Paul V.	Director
Division of Defense Housing Coordination	Palmer, C. F.	Coordinator
Office of the Coordinator of Inter-American Affairs	Rockefeller, Nelson A.	Coordinator
*National Defense Mediation Board†	Davis, William H.	Chairman
*Office of Price Administration	*Henderson, Leon	Administrator
*Office of Production Management	*Knudsen, William S.	Director Gen.
	*Hillman, Sidney	Associate Director-Gen
Production Division	Harrison, W. H.	Director
Purchases Division	Mac Keachie, Douglas	Director
*Priorities Division	*Nelson, Donald M.‡	Director
Labor Division	*Hillman, Sidney	Director
Division of Contract Distribution	Odlum, Floyd B.	Director
Division of Civilian Supply	*Henderson, Leon	Director
Materials Division	Batt, W. L.	Director
*Supply Priorities and Allocations Board‡	*Wallace, Henry A.	Chairman
	*Nelson, Donald M.‡	Executive Dir.
*Office of Scientific Research and Development	*Bush, Dr. Vannevar	Director
Office of the Coordinator of Information	*Donovan, William J.	Coordinator
*Board of Economic Warfare	*Wallace, Henry A.	Chairman
	Perkins, Milo	Executive Dir.
Permanent Joint Board on Defense (U.S.-Canada)	*La Guardia, F. H.	Chairman, U.S.Section
*Selective Service System	*Hershey, L. B., Brig. Gen.	Director
Office of Censorship	Price, Byron	Director
Office of Facts and Figures	MacLeish, Archibald	Director
Office of Defense Transportation	Eastman, Joseph D.	Director

*Discussed elsewhere in this volume.

†Abolished Jan. 12, 1942, and succeeded by the National War Labor Board, with William H. Davis as chairman.

‡President Roosevelt announced Jan. 13, 1942, that he would create the War Production Board, with Donald M. Nelson as chairman, and that the Supply Priorities and Allocations Board would be abolished.

Great Britain.—The following were the ministers and chief permanent officials of the more important of the government departments of Great Britain at the close of 1941:

Ministry or Department	*Name*	*Post*
Admiralty, The Board of	A. V. Alexander	First Lord
	Sir Henry Markham	Permanent Secretary
Agriculture and Fisheries	R. S. Hudson	Minister
	Sir Donald Fergusson	Permanent Secretary
Aircraft Production	Col. J. T. C. Moore-Brabazon	Minister
	Sir Archibald Rowlands	Permanent Secretary
Air Ministry	Sir Archibald Sinclair	Secretary of State
	Sir Arthur Street	Perm'nt Under-sec'y
Burma Office	L. S. Amery	Secretary of State
	J. C. Walton	Perm'nt Under-sec'y of State (Acting)
Cabinet Office	Sir Edward Bridges	Secretary
Civil Service Commission	A. P. Waterfield	1st Commissioner
Colonial Office	Lord Moyne	Secretary of State
	Sir Cosmo Parkinson	Perm'nt Under-sec'y
Commissioners of Crown Lands	The Minister of Agriculture and Fisheries (*ex-officio*)	Commissioner
	C. L. Stocks	Perm'nt Commissioner
Crown Agents for the Colonies	Sir W. Cecil Bottomley	
	H. C. Thornton	
Customs and Excise, Board of	C. Wilfred G. Eady	Chairman
Dominions Office	Lord Cranborne	Secretary of State
	Sir Eric Machtig	Perm'nt Under-sec'y (Deputy)
Duchy of Lancaster	A. Duff Cooper	Chancellor
	Lord Hankey	Deputy Chancellor
Economic Warfare, Ministry of	Hugh Dalton	Minister
	Sir Frederick Leith-Ross	Director-General
Education, Board of	R. A. Butler	President
	Sir Maurice Holmes	Permanent Secretary
Food, Ministry of	Lord Woolton	Minister
	Sir Henry L. French	Secretary
Foreign Office	*Anthony Eden	Secretary of State
	Sir Alexander Cadogan	Perm'nt Under-sec'y
Health, Ministry of	Ernest Brown	Minister
	Sir John Maude	Secretary
Home Office and Ministry of Home Security	Herbert Morrison	Secretary of State
	Sir Alexander Maxwell	Perm'nt Under-sec'y Home Office
	Sir George Gater	Secretary, Ministry of Home Security
India Office	L. S. Amery	Secretary of State
	D. T. Monteath	Acting Perm'nt Under-sec'y
Information, Ministry of	Brendan Bracken	Minister
	Sir Walter Monckton	Director-General
Inland Revenue, Board of	Sir Gerald B. Canny	Chairman
Labour and National Service, Ministry of	*Ernest Bevin	Minister
	Sir T. W. Phillips	Secretary
Lord Privy Seal	C. R. Attlee	Lord Privy Seal
Mines Department	D. R. Grenfell	Secretary
	Sir Alfred Hurst	Under-sec'y
Patent Office	M. F. Lindley	Comptroller-General
Paymaster-General's Office	Lord Hankey	Paymaster-General
	L. Cuthbertson	Asst. Paymaster-Gen.
Pensions, Ministry of	Sir Walter Womersley	Minister
	A. Cunnison	Permanent Secretary
Petroleum Department	Geoffrey Lloyd	Secretary
	Sir Alfred Faulkner	Perm'nt Under-sec'y
Post Office	W. S. Morrison	Paymaster-General
	Sir Thomas Gardiner	Director-General
Privy Council Office	Sir John Anderson	Lord President
	Sir Rupert B. Howorth	Clerk of the Council
Public Record Office	The Master of the Rolls	Keeper of the Records
	C. T. Flower	Deputy Keeper
Public Trustee Office	Sir Ernest Fass	Public Trustee
Scottish Office	Thomas Johnston	Secretary of State
	Sir Horace P. Hamilton	Under-sec'y of State
Stationery Office, H.M.	Sir William R. Codling	Controller
Supply, Ministry of	*Lord Beaverbrook	Minister
	Sir William Brown	Permanent Secretary
Trade, Board of	Sir Andrew Rae Duncan	President
	Sir Arnold E. Overton	Permanent Secretary
Treasury	*Winston Churchill	Prime Minister, First Lord and Minister of Defense
	Sir Kingsley Wood	Chancellor of the Exchequer
	Sir Horace Wilson	Permanent Secretary and Head of H.M. Civil Service
War Office	Capt. David Margesson	Secretary of State
	Sir James Grigg	Perm'nt Under-sec'y
War Transport, Ministry of	Lord Leathers	Minister
	Sir Cyril W. Hurcomb	Director General
Works and Buildings, Ministry of	Lord Reith	Minister
	Sir Geoffrey Whiskard	Permanent Secretary

*See separate article.

Government Expenditures: *see* BUDGETS, NATIONAL.

Government Printing Office: *see* PRINTING OFFICE, U.S. GOVERNMENT.

Government Receipts: *see* BUDGETS, NATIONAL.

Governors and Premiers, British: *see* BRITISH EMPIRE.

Grain: *see* BARLEY; CEREALS; CORN; OATS; RICE; RYE; WHEAT.

Granger, Walter (1872–1941), U.S. explorer and palaeontologist, was born Nov. 7 in Middletown, Vt. With only two years of high school training, he began his career in science by working as an assistant in taxidermy and as an apprentice to scientists in the American Museum of Natural History in New York city. In 1927, after nearly 40 years with the museum, he became curator of fossil mammals, a post he held until his death. A veteran of 28 expeditions, mostly through the wilds of Egypt and Mongolia, Dr. Granger spent 10 years, 1921–31, with Roy Chapman Andrews in the Gobi desert, where the two explorers made a valuable collection of dinosaur bones and eggs. He also unearthed fossil remains in the Dakota Bad Lands, most notable of which was a giant rodent of the middle Oligocene period, found in 1940. Dr. Granger, who was awarded an honorary doctor of science degree from Middlebury college in 1932, was the author of several books on palaeontology. He died in Lusk, Wyo., Sept. 7.

Granite: *see* STONE.

Grapefruit. Production of grapefruit in the United States in 1941 was estimated Dec. 1 by the department of agriculture as 41,490,000 boxes, compared with 43,033,000 boxes in 1940. In California and Arizona boxes of grapefruit average 60 lb.; in Florida and Texas, 80 lb.

U.S. Grapefruit Production by States, 1941 and 1940

State	1941 boxes	1940 boxes	State	1941 boxes	1940 boxes
Florida			Arizona	3,000,000	2,650,000
Seedless varieties	8,800,000	8,400,000	California		
Other varieties	12,600,000	16,200,000	Desert Valleys	965,000	960,000
Texas	15,100,000	13,600,000	Other varieties	1,025,000	1,023,000

In Trinidad the arrival of a large force of Americans to construct military bases provided an unexpected outlet for the largest crop of grapefruit on record in that island—290,000 boxes of 100 lb. each, compared with 260,000 boxes in 1940. Consumption of grapefruit juice increased more than 1,000% and utilized a part of the crop which could not be exported to the United Kingdom and Canada because of a shortage of shipping. The British ministry of food contracted for 8,400 tons of grapefruit pulp in Jamaica, providing an outlet for production which amounted to 180,000 boxes in 1941 as compared with 185,000 boxes in 1940. Exports of grapefruit to the United States from the Isle of Pines Aug.–Oct. 1941 were 150,314 boxes, a slight decrease from 153,000 boxes in 1940. Preliminary estimates placed the 1941–42 crop in Honduras at 140,000 boxes, compared with 80,000 boxes the previous season. No figures were available in 1941 from Palestine, which in the years preceding the war had developed a rapidly expanding production and shipped more than 2,000,000 boxes annually to Europe. (S. O. R.)

Grapes. The U.S. grape crop of 1941 was estimated by the department of agriculture as 2,651,430 tons, 4% larger than the 1940 crop of 2,547,910 tons. The ten-year (1930–39) average annual production was 2,264,062 tons. Raisins were 220,000 tons (dry basis) in 1941, and 171,000 tons in 1940; ten-year average, 215,600 tons. One ton of dried raisins is equivalent to about four tons of fresh grapes. In California, the outstanding

U.S. Production of Grapes by Leading States, 1941 and 1940

State	1941 tons	1940 tons	State	1941 tons	1940 tons
California	1,990,800	2,250,000	Pennsylvania	21,920	23,000
New York	71,750	75,800*	Arkansas	9,810	9,600
Michigan	57,330	54,600	Missouri	9,770	10,000
Ohio	30,300	37,500	Illinois	6,770	8,100

*Includes 3,000 tons not harvested because of market conditions.

producer, the total of all varieties grown in 1941 was 1,990,800 tons, compared with 2,250,000 tons in 1940 and a ten-year average of 2,411,000 tons. Wine varieties accounted for 497,000 tons of the 1941 California production, as against 607,000 tons in 1940 and the ten-year average of 583,000 tons. Raisin varieties grown in California in 1941 were 1,143,600 tons. In 1940 raisin grapes in California totalled 1,213,000 tons; the ten-year average was 1,421,000 tons. Table varieties in California in 1941 were 350,200 tons as compared with 430,000 tons in 1940, and a ten-year average of 407,000 tons. Late spring freezes caused considerable damage to the 1941 grape crops in New York, Pennsylvania, Ohio and Michigan. Further injury to the crops in New York and Pennsylvania was caused by an unseasonably dry summer. Forty-four states raised grapes in quantities.

(S. O. R.)

Graphite. Exports of graphite from Chosen have been increasing rapidly, and reached 86,531 short tons in 1939, with 1940 not reported; almost the entire exports have gone either to Japan or to Japanese-controlled territory. Mexican exports rose sharply in 1940 to 14,551 short tons, all to the United States. Exports from Ceylon in 1940 were 24,028 long tons, an increase of 8% over 1939, but average value increased by 58%. Shipments were mainly to Great Britain, the United States and Japan. During the first three quarters of 1940 shipments to Japan were as large as to Great Britain, but in the last quarter these were cut heavily in favour of Great Britain and the United States. There was increased demand for Madagascar graphite during 1940, but no statistical information was received after 1938, and the same was true for all the European producing areas, which were under German control.

Canada produced a small tonnage of graphite up to 1939; there was no mining in 1940, but there was some recovery from discarded tailings from former years. Although no production data were reported, there was production of graphite in 1940 in the United States at Carson City, Nev., Coosa county, Ala., and St. Lawrence county, N.Y. Imports into the United States were 31,528 short tons, an increase of nearly half over 1939, which in turn was the largest since 1929. (G. A. Ro.)

Graser, Earle W. (? –1941), U.S. radio actor, known as the "Lone Ranger," whose voice was known to an estimated 15,000,000 radio listeners, was born in Kitchener, Ont. In 1933 he was selected among five candidates for the role of the "Lone Ranger," a hard-riding, gallant cowboy hero of a radio script whose adventures thrilled millions of American youth. The studio shrouded him in mystery and his identity was not known until his death April 8 in a motorcar crash in Farmington, Mich., where he made his home.

Grauert, Ulrich (? –1941), German colonel general and air force commander, attended military school in Potsdam and in 1909 joined the artillery division as ensign. During World War I, he became commander of an air force detachment, was promoted to colonel in 1934, and was then transferred to the new reichswehr air force and put in charge of various flying schools.

After the campaign on the western front in 1940, he was promoted by Adolf Hitler to the rank of colonel general. A pioneer in developing the modern air force under Hermann Goering, Grauert distinguished himself in both the war in Poland and the campaign on the western front. With Major General Wolfram von Richtofen, he led the Stuka assaults on the British forces evacuating Dunkirk; he also played a leading role in the battle of Britain. The German high command announced on May 24 that Grauert was killed in action. Official sources indicated that he was killed while in an air raid over Britain.

Gravel: *see* SAND AND GRAVEL.

Great Britain & Northern Ireland, United Kingdom of.

This comprises the main island of Great Britain, with numerous smaller islands off the English and Scottish coasts, and the six northeastern counties of Ireland. It is a constitutional monarchy, with a king and a parliament of two houses, the house of lords consisting of about 670 hereditary peers, 24 spiritual peers, 16 Scottish representative peers, a number of Irish representative peers (in 1940, 14; vacancies were not filled in 1941) and a few life peers who have held high judicial office; and the house of commons, numbering 615 members, elected by a practically universal suffrage. Flag, the Union Jack, consisting of a red cross on a white field (for England), surcharged on a diagonal red cross on a white field (for Ireland), surcharged in turn on a diagonal white cross on a blue field (for Scotland). Ruler: King George VI (*q.v.*); premier: Rt. Hon. Winston S. Churchill (*q.v.*); established church: Protestant Episcopal.

Area and Population.—Area 93,991 sq.mi.; pop. (est. June 30, 1939) 47,680,500 (England and Wales 41,375,000). Chief towns (pop. est. June 30, 1938): London (cap.), city and metropolitan police districts, 8,700,000; city and metropolitan boroughs only, 4,062,800; Glasgow (June 30, 1939), 1,131,500; Birmingham, 1,041,000; Manchester (including Salford), 932,300; Liverpool, 827,400; Sheffield, 520,000; Leeds, 494,000; Edinburgh (June 30, 1939), 473,200; Belfast (Jan. 1, 1939), 443,500.

History.—The United Kingdom's history in 1941 is the history of its war effort, all its activities being in one way or another directed to the prosecution of the war.

The War in Africa.—The warfare of 1940 had presented a comparatively simple picture. From the Norwegian campaign of April to the air battle of Britain in the autumn, a series of distinct and decisive episodes had followed one another, with brief intervals but also almost without overlap, like the acts of a classical tragedy. The year 1941 presented no such simple and easily memorized picture. When the year opened, the small army of General Sir Archibald Wavell (*q.v.*), its striking force never more than 30,000, was already embarked on its brilliant campaign in Cyrenaica. Bardia fell on Jan. 5; Tobruk, Derna, Cyrene followed and finally Bengasi on Feb. 6. Marshal Graziani's army, which was to have closed the Suez canal, had ceased to exist. Italy's entry into the war had enabled the British and Australian forces to make a heartening rejoinder, on however small a scale, to Hitler's conquest of France in the previous summer. The campaign offered a model for the co-operation of land, sea and air arms. Meanwhile the conquest of the Italian empire in East Africa had begun. Kassala, previously occupied by Italian forces within the Sudan border, fell on Jan. 19, Agordat on Feb. 2, Mogadishu, capital of Italian Somaliland, attacked from Kenya, on Feb. 26, Berbera in British Somaliland was reoccupied on March 17, Cheren in Eritrea fell after a very stubborn defense, and Harar in Abyssinia on March 27, Addis Ababa on April 6. The Emperor Haile Selassie returned to his capital May 5, and the duke of Aosta, after a far more creditable resistance than that offered by Graziani, asked for an armistice May 18. A few isolated Italian strongholds remained, but the last of these—Gondar—surrendered Nov. 27. The British forces were then completely released for service in the Mediterranean area, where the empire forces, less than 100,000 at the time of the collapse of France, amounted to 500,000 or more late in 1941.

But there had already been a setback which looked at one time more serious than it later proved. On Feb. 17 a skirmish between British and German mechanized units was reported at El Agheila, in the desert which separates Cyrenaica from Tripoli. On April 3 the Germans surprised and occupied Bengasi. Ten days later they were on the Egyptian frontier, though British and empire forces still held Tobruk. This proved the sum total of the success of the axis. Tobruk was held and its siege was lifted in December, shortly after the British forces began their second major offensive against Libya Nov. 18. This campaign, marked by a series of gigantic tank battles in the desert, had regained all Cyrenaica for the British by the end of the year.

The Balkans.—The reverse in Libya was in part explained by the diversion of British forces to aid Greece. Hitler opened war on Greece and Yugoslavia April 6; Salonika was occupied April 9, and Yugoslavia was out of the war except for unconquered guerrilla forces, on April 17; before the end of the month Greece was subdued. The British government sent a force of about 60,000 from Africa to support the forlorn hope of Greece. This force inflicted tremendous casualties, and three-quarters of it was successfully evacuated, part of it being retained in Crete under the New Zealander General Freyberg. The German attack upon Crete followed on May 20 and accomplished its purpose in the course of a battle, without precedent in the technique of warfare, which lasted ten days. The German attack by sea was entirely defeated with heavy loss, but without adequate aerodromes it was impossible to defeat the German invasion by air. About half the British force of nearly 30,000 in Crete was evacuated.

Iraq and Syria.—Meanwhile German intrigues had secured a pro-German revolution in Iraq (April 3), and the government of Rashid Ali protested (May 1) against the reinforcement of British troops in the country, though this was in accordance with the Anglo-Iraqi treaty. The Iraqi campaign and the overthrow of Rashid Ali were completed within the month of May. But Iraq led on to Syria, because the Germans, with Vichy-French connivance, had been using Syrian aerodromes on their way to Iraq. With the fall of Crete (which coincided with the completion of the Iraqi campaign) it was obvious that the Germans might well have more extended uses for Syria if it was left in the subservient control of General Dentz. British and Free French forces entered Syria on June 8. Hopes that a considerable part of the French garrison would prove friendly, and that heavy fighting would be avoided, were disappointed. The campaign lasted a month and was concluded on July 9 with the surrender of the province and all its garrisons.

ITALIAN PRISONERS, identified by large red circles on their backs, helped British farmers harvest their fields in 1941

Russian Campaign.—The small Syrian campaign coincided with the opening stages of the greatest land campaign of the war. Hitler attacked the U.S.S.R. June 22, and the British prime minister took the first available opportunity of declaring, by broadcast, that Britain would render the U.S.S.R. all the assistance in her power, this announcement coming all the more effectively from a statesman notable since 1917 for his detestation of the theory and practice of communism. The Anglo-Russian treaty of alliance was signed July 13 and plans for British assistance, by munitions and otherwise, to the U.S.S.R. began to be explored. Plans were further elaborated at an Anglo-Russo-U.S. conference in Moscow during the opening days of October. The valour, skill and material resources of the Russian defense far surpassed the expectations of the great majority of people in Britain. Geography in this war as in World War I interposed formidable obstacles in the way of direct support. The most overt example of Anglo-Russian co-operation was their joint intervention in Iran (Persia) in the last days of August. German agents were swarming over the country. In German hands Iran could have been a base for attack on the U.S.S.R., Turkey, Iraq or India. In Anglo-Russian control it provided a channel through which British and U.S. supplies could reach the U.S.S.R. The Allied occupation was followed by the flight of the pro-German shah.

The War at Sea.—All these campaigns, so far as the British part in them was concerned, were small-scale warfare by modern standards. The greater part of the British army remained in the British Isles, not only training but playing an essential part in the war in that, along with the air and sea defenses, it frightened Hitler off the only course of action by which he could secure the quick victory he so often promised his people. The navy on the other hand was working at full stretch all the time. After the air invasion was defeated in the autumn of 1940, it was recognized that the battle of the Atlantic was the most crucial aspect of the war. Hitler, like Napoleon, had failed for the time being in the preliminaries of a direct invasion, and was attempting "circumfamination," to borrow a barbarous but expressive term from a mediaeval chronicler. The sinking of British, Allied and neutral shipping by enemy action rose to figures in the neighbourhood of 500,000 tons in April and May, but dropped thereafter very decisively. In July, August and September the shipping tonnage sunk by enemy action was only a third of that sunk in the three previous months, and the shipping losses of July and August amounted to less than a third of the enemy tonnage destroyed by Britain and her Allies in the same months. This, as Churchill claimed, was an extraordinary achievement in view of the fact that enemy ships confined themselves to short coast voyages, whereas British ships carried on a gigantic world-wide trade, with never less than 2,000 ships at sea and never less than 400 in the danger zone. In the latter part of the summer the average losses of ships in convoy were no more than one in 240, and the average weekly imports were 850,000 tons. The increased food rations introduced in the autumn were no doubt in part a result of these achievements.

The work of a navy, even more than that of an army, may be

compared with an iceberg, of which the part visible above the waterline is only one-ninth of the whole. A far smaller fraction of the arduous toil of the navy, from battleship to minesweeper and submarine, is enlivened with the zest of battle conditions, and of such actions only a small number can be mentioned here.

In January German dive bombers from Sicily attacked a British convoy bound for Greece in the Sicilian channel and damaged the cruiser "Southampton" so seriously that it had to be sunk. In February naval units bombed Genoa and early in March raided the Lofoten islands off the northern coast of Norway, destroying the fish oil plant there and bringing away both German prisoners and Norwegian volunteers. At the end of the month the fleet of Admiral Sir Andrew Cunningham (*q.v.*) destroyed, without loss to itself, a considerable part of the Italian navy off Cape Matapan. It is possible that the Italian fleet was, on this occasion, acting as a decoy to enable an important German convoy to cross to Tripoli—with results already recorded. If that be so, the British navy had its revenge by destroying an enemy convoy in the Sicilian channel on April 16. Other convoys later in the year suffered a similar fate in the same waters. In the last week of May the royal navy suffered some serious losses from air attack while defending Crete from invasion by sea, but here again the balance was almost at once redressed elsewhere; for the sinking of the "Hood" in Icelandic waters was followed by the memorable hunt and destruction of the "Bismarck," reputed unsinkable, on May 27. But late in the year the navy suffered severe losses. "Ark Royal," the aircraft carrier which German claims had repeatedly "sunk," was finally sent to the bottom by a torpedo in the Mediterranean near Gibraltar in November. And shortly after Japan entered the war against Britain and the U.S.A. Dec. 7, Japanese planes sank the new capital ship "Prince of Wales" launched in 1939, and the battle cruiser "Repulse," off the eastern coast of Malaya.

Air Warfare.—In air warfare the spring witnessed a renewal of the indiscriminate night bombing of densely populated areas which had constituted the enemy's principal air activity in the previous autumn. London and the Clydeside, Plymouth, Bristol, Liverpool and Hull were among the chief victims, and the fatal casualties averaged 5,000 for each of the months March, April and May. Thereafter, owing no doubt to the demands of the Russian campaign, German air attacks on Great Britain petered out, except for occasional small-scale raids. The British air force, on the other hand, continually extended the daring and the weight of its attack on all enemy objectives, attacking by day as well as by night. These results were not secured without casualties, but the losses were insignificant compared with those suffered by the German raiders in the autumn of 1940.

Civil Defense.—In Britain itself a number of steps were taken to reduce, in one way and another, the discomforts of air-raid precautions and the damage done by the raids. Shelter accommodation was enormously improved, in quality and quantity. After the largely preventable damage done by the incendiary raid at the end of Dec. 1940, fire-watching was made a compulsory service, the compulsion to be applied wherever volunteer organization fell short—a typically British compromise, the adequacy of which had not been severely tested by the end of 1941. The government carried a War Damage bill, establishing compulsory schemes for the insurance of buildings and industrial and commercial equipment all over Britain and a voluntary scheme for the insurance of private chattels. The mere existence of such a scheme was proof of the fact that air-raid damage could be regarded as a more or less measurable risk.

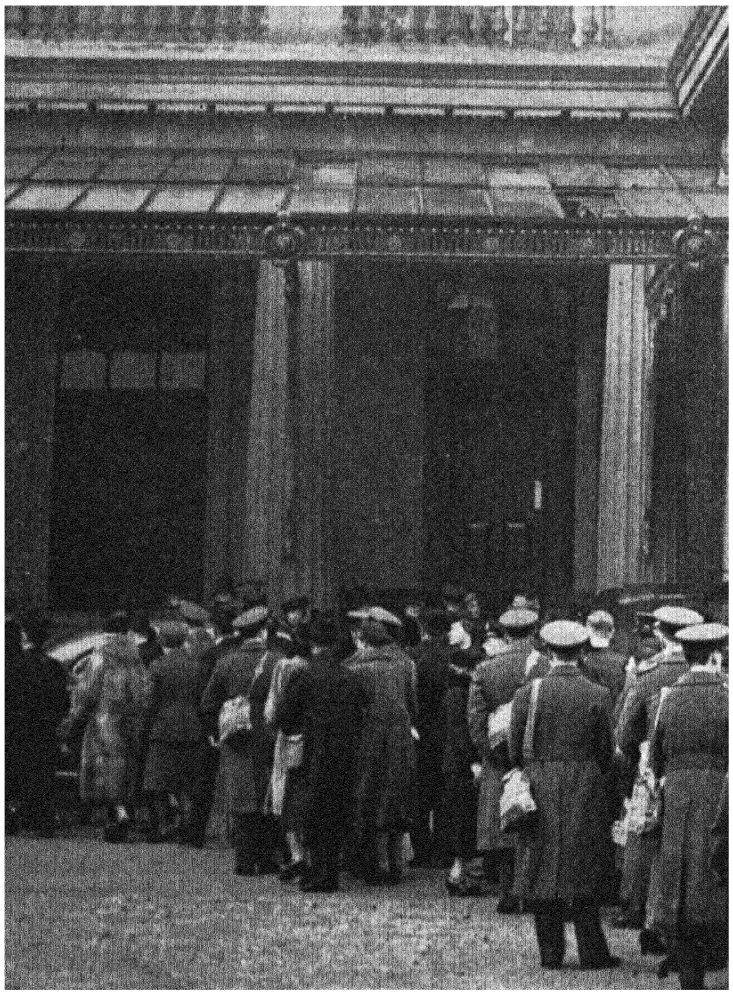
War Industry.—The Fire Watchers order was the first example of the use of the government's powers, entrusted to it by parliament, to conscript service for nonmilitary purposes. Many had demanded that the same principle should be applied on a wholesale scale to industrial labour, but Ernest Bevin (*q.v.*), the minister of labour, being well acquainted with the trade union world from which he came, preferred to be a leader rather than a dictator. Employers in certain industries were prohibited by the Essential Work order from dismissing workers and workers were prohibited from giving notice, except with the consent of the ministry of labour. Certain age groups of men and women were ordered to register and were thereby liable for war work on government order, but only a small proportion of those registered were called up in 1941. There was a good deal of criticism of the achievement of the government in securing, or failing to secure, the maximum output of all forms of war material. In so vast and so rapidly improvised an organization weak spots were easily found and easily given undue prominence. Criticism was focused in a house of commons debate on production, the lead among the critics being taken by Sir J. Wardlaw Milne. The prime minister replied a week later. He did not claim that all was perfect but sought to show that the critics had painted a misleadingly gloomy picture; he also decisively rejected the idea of a super-man colleague to control the whole "industrial front."

The Budget.—Sir Kingsley Wood's budget was acclaimed as the first to face squarely the financial facts of the war; £250,000,000 was to be raised by additional income tax, half of it by raising the basic rate from 7*s.*6*d.* to 10*s.*, and half by reductions in the family allowances. These latter subtractions from the taxpayer's income were to be of the nature of a forced loan repayable with interest after the end of the war. The chancellor thus accepted, up to a point, the principle of compulsory saving advocated a year earlier by J. M. Keynes. The plan of collecting income tax on salaries and wages at the source, enacted with the previous budget but coming into force not long before the beginning of 1941, proved a boon to taxpayers as well as to the government. Criticism of the 100% excess profits duty as destroying the producer's incentive to economy was met by somewhat roundabout devices, the government being unwilling to abandon a principle so superficially attractive to all who had no chance of earning excess profits.

U.S. Relations.—Support from the United States was of the nature of a steady crescendo in 1941. The milestones in the U.S. advance toward co-operation prior to American entry into the war Dec. 8 were the president's message to congress, foreshadowing the Lend-Lease bill on Jan. 6, 1941, the enactment of that measure in March, followed by prompt presidential action giving practical effect to its provisions; the announcement at the end of April that the U.S. navy, without actually convoying flotillas across the Atlantic, would establish patrols supplementing the work of British convoys—a step which was doubtless responsible in part for the big reduction in shipping losses from June onwards; and the meeting of President Roosevelt and Prime Minister Churchill, at President Roosevelt's invitation, which resulted in the eight-point statement on joint postwar policy known as the Atlantic charter, in August.

Relations with the U.S. were closer than ever after the treacherous attack on Pearl Harbor and the subsequent U.S. entry into the war. The year ended with victorious advances in Africa and in the U.S.S.R., Britain's other great ally. But it ended also with anxious situations in the far east, where Hongkong had fallen, and large sections of Malaya and the Philippines had been overrun by the Japs.

Northern Ireland.—As for Northern Ireland, it may be said that never in its history, not even at the time of Londonderry and the Boyne did she occupy a position so crucial to the cause of world freedom as in 1941. In World War I Britain had full use of all Irish facilities for the defense of her Atlantic approaches. In



AT AN INVESTITURE in Buckingham palace in Feb. 1941, King George decorated British soldiers, sailors and civilians for conspicuous acts of bravery. Recipients of medals are shown lined up before the palace, awaiting their decorations

World War II the use of neutral Eire has been denied her. It is therefore through the narrow waters of the North channel that the bulk of British shipping must make the western ports of Britain under the protection of the navy and air force, which can operate effectively in those waters mainly because the six counties of Northern Ireland are still loyal to the British crown. Without a bridgehead in Northern Ireland Britain's most vulnerable flank would be turned. The government of Northern Ireland expressed a wish for the application of conscription to their province but reluctantly withdrew it at the desire of the British government, which foresaw complications with Eire. The war has inevitably widened in some respects the gulf between the two Irelands; yet not wholly so, for the prompt and gracious assistance rendered by Dublin to Belfast, after the latter had suffered air bombardment in April and May, was deeply appreciated. (D. C. So.)

Education.—In 1937–38: elementary, England and Wales—departments under separate head teachers 29,988, scholars on register 5,150,874; elementary, Scotland—schools 2,895, scholars 617,047; elementary, Northern Ireland—schools 1,700, scholars 191,862; secondary, England and Wales—grant-aided schools 1,398, scholars 470,003; secondary, Scotland—grant-aided schools 252, scholars 156,645; secondary, Northern Ireland—grant-aided schools 75, scholars 14,557; universities, students: England 41,707 (full time 36,378); Wales 3,089 (full time 2,970); Scotland 10,384 (full time, 9,841); Northern Ireland 1,590 full-time students.

Banking and Finance.—Revenue, ordinary (actual 1940–41) £1,408,867,000; expenditure, ordinary (actual 1940–41) £3,884,288,000; public debt (national) March 31, 1941, £11,394,566,000, exchange rate 1941, £1=403.5 cents. (*See* Table I and BANK OF ENGLAND.)

Table II.—*Overseas Trade, Showing the Variations in the First Eight Months (Jan. 1–Aug. 31) of Each of the Years 1937–40*

(in million £)

	1937	1938	1939	1940
Imports	654.4	616.5	605.9	792.9
Exports	341.4	306.9	313.6	312.6
Re-exports	54.2	42.4	36.3	22.6
Total Exports	395.6	349.3	349.9	335.2

Trade and Communication.—Overseas trade in million £: imports, merchandise (1939) £885.5; (1940) £1,099.9; exports, domestic (1939) £439.6 (1940) £413.1; re-exports (1939) £46.0, (1940) £26.2. (*See* Table II.)

Table I.

ESTIMATED REVENUE 1941–42

	£	£
Income Tax	756,000,000	
Surtax	80,000,000	
Estate Duties	82,000,000	
Stamps	14,000,000	
National Defense Contribution and Excess Profits Tax	210,000,000	
Other Inland Revenue Duties	1,000,000	
Total Inland Revenue		1,143,000,000
Customs	310,700,000	
Excise	266,660,000	
Total Customs and Excise		577,360,000
Motor Vehicle Duties		39,000,000
Post Office (net receipt)		3,300,000
Crown Lands		1,100,000
Receipts from Sundry Loans		2,600,000
Miscellaneous		20,000,000
Total Ordinary Revenue		£1,786,360,000

ESTIMATED EXPENDITURE 1941–42

	£
Interest and Management of National Debt	255,000,000
Payments to Northern Ireland	9,200,000
Miscellaneous Consolidated Fund Services	7,800,000
Total	272,000,000
Supply Services	
Defense (token votes*)	4,000
Civil	
Central Government and Finance	2,358,000
Foreign and Imperial	12,412,000
Home Department, Law and Justice	20,284,000
Education	66,222,000
Health, Labour, Insurance (inc. Old Age and Widows' Pensions)	185,760,000
Trade, Industry and Transport	23,080,000
Works, Stationery, etc.	14,850,000
War Pensions 1914–18, and Civil Pensions	40,956,000
Exchequer Contributions to Local Revenues	52,794,000
Unclassified Services*	2,000
	418,737,000
Votes of Credit	3,500,000,000
Tax Collection—Customs and Excise and Inland Revenue votes (inc. Pensions £1,375,000)	16,220,000
	£3,934,957,000
Total 1941–42 Expenditure	£4,206,957,000

*Substantive cost to be met from votes of credit.

Communication.—Roads (March 31, 1938): England and Wales, (class I) 20,627 mi.; (class II) 13,070 mi.; Scotland (class I) 6,632 mi.; (class II) 3,967 mi.; Northern Ireland (class I) 1,273 mi.; (class II) 1,933 mi. Railways (Dec. 31, 1938): Great Britain, track open to traffic, excluding sidings, 20,007 mi.; Northern Ireland, standard gauge, 633 mi., narrow gauge 121 mi. Airways (1938): distance flown 14,331,000 mi.; passengers carried 222,200; mail carried 3,453 tons; freight carried 2,527 tons. Empire services (airways), traffic ton miles including passenger ton miles (1937–38) 7,153,767; (1938–39) 13,734,899; passengers carried (1939) 12,614. Shipping, excluding vessels under 100 tons (July 1, 1939), 17,984,158 gross tons; under construction (July 1, 1939) 791,500 gross tons; shipping (net tonnage with cargo), entered (monthly average 1938) 5,698,000; cleared (monthly average 1938) 4,907,000; entered (Aug. 1939) 6,617,000; cleared (Aug. 1939) 5,525,000. Motor vehicles licensed (Sept. 30, 1938): cars 1,944,394; hackney vehicles (taxis, buses, coaches, etc.) 87,730; commercial vehicles 590,397; motorcycles 462,375; total 3,084,896. Wireless receiving set licences (Sept. 30, 1939) 9,085,050; telephones (Dec. 31, 1939): number of stations (including public and private lines, call boxes, etc.) 3,235,500.

Agriculture, Manufacturing, Mineral Production:—Production in 1939: (in metric tons) wheat 1,680,000; oats 1,760,800; barley 903,300; potatoes (1938) 5,197,100; beet sugar 494,100; hops (1938) 131,000; coal (1938) 230,658,000; iron ore (metal content) (1938) 3,615,000; pig iron and ferro-alloys (1938) 6,870,000; steel (1938) 10,565,000; sea fisheries (wet fish only) (1938) 1,062,665; whale oil (1938) 221,100; benzol (1938) 218,800; shale oil (1938) 131,000; beef and veal (1937–38) 688,000; pig meat (1937–38) 415,200; mutton and lamb (1937–38) 257,000; wool (1938) 50,300; wood pulp (1938) 270,000; silk, artificial

Table III.—*Agricultural Production and Acreage, England and Wales, 1938 and 1939*

Crops	1938		1939	
	Thous. met. tons*	Acres	Thous. met. tons*	Acres
Wheat	1,855	1,830,261	1,555	1,682,616
Barley	803	885,499	794	910,073
Oats	1,069	1,300,530	1,119	1,358,008
Mixed Corn	74	92,240	72	82,781
Seeds hay	1,281	1,184,082	1,700	1,302,858
Meadow hay	3,131	4,229,308	4,535	4,611,564
Beans (for stock-feeding or seed)	106	129,817	109	132,968
Peas (for stock-feeding or seed)	30	38,153	23	36,800
Potatoes	3,486	474,786	3,312	453,976
Turnips and Swedes	5,081	421,190	4,947	394,249
Mangolds	3,599	212,531	3,938	208,891

*One metric ton = .98421 English ton.

54,450; margarine (1938) 211,600; butter (1938) 47,000; cheese (1938) 44,100; flax (fibre) (Northern Ireland) (1938) 4,100; rye (1938) 10,900; lead ore (metal content, 1938) 30,200; aluminum (smelter production) 25,500; super-phosphates of lime (1937) 449,000. (*See* Table III.)

Industry and Labour.—Index of industrial production (1929=100) av. (1938) 115.5; av. (Jan.–June 1939) 123.1; index of employment (1929=100) av. (1939) 113.0. Industrial population, insured (July 1939) 14,838,000; unemployed, wholly, av. (1939) 1,297,801 (8.8%); temporary, av. (1939) 215,759 (1.5%); wholly av. (1940) 803,000; temporary av. (1940) 160,000; wholly (May 31, 1941) 335,000; temporary (May 31, 1941) 75,000. (*See* BRITISH EMPIRE and the articles on the various dominions and divisions thereof; *see* also BLOCKADE; DEMOCRACY; IRELAND, NORTHERN; JAPAN; PROPAGANDA; SHIPPING, MERCHANT MARINE; SUBMARINE WARFARE; WORLD WAR II.)

Great Lakes Traffic: *see* WATER-BORNE COMMERCE OF THE UNITED STATES.

Greece. A kingdom in the southern part of the Balkan peninsula, under German and Italian occupation in 1941. Area 50,147 sq.mi., of which 41,328 are mainland; pop. (census May 16, 1928) 6,204,684; (estimated, 1940) 7,150,000.

Capital, Athens (392,781). Chief cities: Thessaloniki (236,524); Patras (61,278); Cavalla (49,980); Candia (33,404); Corfu (32,221). Religion: mostly Greek Orthodox; 126,017 Mohammedans, 72,791 Jews. King: George II (*q.v.*); prime minister: Emmanuel Tsouderos.

History.—The year 1941 was a tragic one in the history of Greece. The country had been involved in war through Italian aggression on Oct. 28, 1940.

By the beginning of 1941, the heroic resistance of the Greeks had not only driven the Italian armies, in spite of their great superiority in numbers and material, beyond the Greek frontiers, but the Greeks had succeeded in occupying the southeastern and eastern part of Italian-dominated Albania, including such important towns as Kortcha and Argyrokastro. From this moment on the Greeks were able to expand slowly their grip on Albania and to repel all Italian counterattacks with great losses for the aggressor.

The main struggle centred around Tepeleni. A blow was dealt to Greek leadership, however, when General John Metaxas (*q.v.*), who had established a military dictatorship in Greece Aug. 4, 1936, and whose military knowledge had prepared the country for its successful defense, died Jan. 29 after a very short illness.

Alexander Korizis (*q.v.*), governor of the national bank, was appointed in his place. He had never been active in politics, but was held in high esteem as an administrator by Metaxas and was expected to continue the former's policy. Under his leadership the Greeks continued their successful efforts to defeat the Italians, in spite of the fact that Signor Mussolini himself took over the command of the Italian troops in Albania and ordered a powerful counteroffensive. The Greeks were cheered by British support.

At the beginning of March the British foreign secretary, Anthony Eden (*q.v.*), and the chief of the British general staff, Sir John G. Dill, visited Athens, and it was announced that the two countries found themselves in complete agreement on all points of the situation. The Greek government tried, as it found itself faced with the danger of a sudden German attack through Bulgaria, to come to an agreement with Yugoslavia and Turkey for a common defense of the liberties of the Balkan peoples. Turkey and Greece were bound to mutual assistance by a treaty of Sept. 1933, which pledged the use of military force in a common defense of their frontier in Thrace.

But although Turkey declared her full sympathy with Greece, no help came from there. On the other hand Yugoslavia, after the overthrow of its government which had signed a treaty of friendship with Germany, resisted the German plans of domination of the Balkans, but the resistance of the not sufficiently prepared Yugoslav army proved of no avail, and its debacle hastened the debacle of the Greek army under the onslaught of the German armies who attacked through Yugoslavia. Though the Greeks foresaw clearly that Germany's entry into the war might spell the doom of Greece, the foremost Greek journalist, George Vlahos, warned Germany on March 8 that Greece "will show the world how to die as she has shown how to fight."

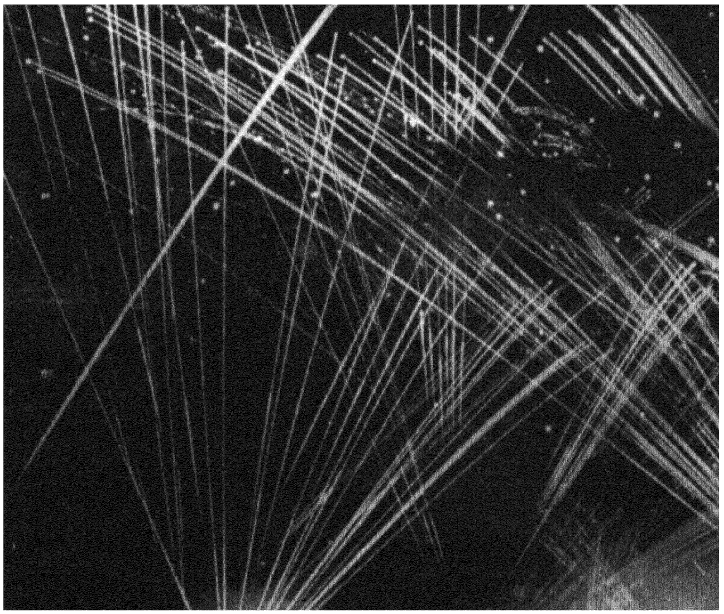
Premier Korizis emphasized in a speech to the Greek youth on March 24 that "Greece is giving an example in leading the way toward freedom for the rest of Europe. We are struggling not only for our own integrity, but for the good of the whole world, in order to help raise humanity. We will die if necessary." When on Sunday, April 6, German legions from Bulgaria attacked Greece and at the same time broke through the southeastern Yugoslav defenses, thus opening up the Vardar valley for a German advance, the Greek army in Thrace and eastern Macedonia found itself cut off and Thessaloniki was soon occupied by the Germans. The British who came to the help of the Greeks fought valiantly on their side but were greatly outnumbered, especially in planes and tanks, and had to withdraw, so that the Greek army in the Epirus had to abandon Albania to the Italians. Under these tragic circumstances Premier Korizis committed suicide on April 18. A provisional military cabinet under the king as premier and with Emmanuel Tsouderos as foreign minister was formed, after Kostas Kotzias, a former military governor of Athens, and General Alexander Mazarakis, a former war minister, had failed to form a war cabinet. On April 21, Tsouderos became prime minister. He was one of Greece's leading economists and a native of Crete. On April 23, however, the high command of the Greek army under General Tsolakoglou surrendered.

The surrender came while British troops were still fighting in the historic pass of Thermopylae. Under this condition the government had no choice but to evacuate the Greek mainland and to withdraw to the island of Crete. Most of the British troops also succeeded in evacuating the mainland. By the end of April the whole of Greece with the exception of Crete was in German hands (*See* WORLD WAR II).

Greek freedom, at least temporarily, was extinct. The swastika flew over the Acropolis. Though a Greek puppet government under General Tsolakoglou was formed in Athens, the Greek population kept up the spirit of resistance.

The northeastern part of Greece, Macedonia and Thrace, were occupied by Bulgarian troops and administered in a most oppressive way by Bulgaria, while the rest of the country was occupied

A CRISS-CROSS PATTERN of search-lights and tracer shells lighted the sky of this Greek city in April 1941 as British and Greeks strove to drive off German bombers



mainly by Italian troops. Few of the Greeks were ready to cooperate with the invaders. The most important among them were Dr. Constantine Logothetopoulos, a physician, and the small Ethnikon Sozialistikon Kommatos or national socialist party under the journalist Yannaros and Captain Spyros Botsaris.

Meanwhile the Greek government and the British forces in Crete were exposed to an air-borne attack upon the island which began on the night of May 19–20 and forced the British, after 12 days of fierce resistance, to evacuate the island, after having suffered great losses. The king of Greece and the cabinet reached Egypt, and in September a new Greek cabinet, headed by Emmanuel Tsouderos, was formed as a Greek government-in-exile in London. Admiral Alexander Sakellariou continued as vice-premier in the middle east.

Education and Finance.—In 1937 Greece had 8,159 elementary schools with 967,588 pupils, and 408 high schools with 78,843 pupils. The governmental expenditure for education amounted to 1,012 million drachmai. There were two universities and one institute of technology in Athens, and one university in Thessaloniki in addition to several specialized schools of higher learning.

The monetary unit was the drachma (= approx. 0.67 cent U.S. in 1940), which had been stabilized in 1928 at 77.02 drachmai to the dollar, but the stabilization had been suspended in April 1932. For the year 1939–40 revenue was estimated at 14,014 and expenditure at 14,653 million drachmai. The total national debt amounted at the end of 1938 to 52,140 million drachmai. On Dec. 31, 1939, the total bank note circulation was 9,453 million drachmai. There were 29 banks in Greece with a capital of 1,970 million drachmai and deposits of 17,371 million drachmai at the end of 1936.

Trade, Communication, Agriculture, Minerals.—The value of imports amounted in 1939 to 12,275, that of exports to 9,199 million drachmai. Chief articles of export were fruit and tobacco, oils and waxes, and mineral products; chief articles of import were metals and metal articles, foodstuffs, yarns and textiles, and mineral products.

In 1939 the chief importers to Greece were Germany, Great Britain, Rumania and the United States; the chief exporters from Greece were Germany, the United States, Great Britain and Italy. Railways showed a mileage of 1,668 mi., while there were 8,440 mi. of roads.

There were 1,368 post offices, 37 telephone offices, with 38,427 subscribers and 23,976 km. of telegraph lines.

Greece is chiefly an agricultural country, although the mountainous character leaves only a small part cultivated. Olives and fruit are produced in great quantities and good quality. The industrial development had started after World War I. There are mines of iron ore, iron pyrites, magnesite, chromites, emery, lead and lignites. (*See* also ALBANIA.)

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(H. Ko.)

Greenland. The world's largest island (736,518 sq.mi., some 705,000 covered by glacier), in the North Atlantic ocean, N.W. of Iceland. A Danish possession, it came under the United States protection in 1941. Capital, Godthaab. A population of about 18,000 (est. 1941) is scattered in small settlements on the west coast, and 1,000 on the east coast, about 600 in all being Danes, the rest native Greenlanders.

Seats of the governors are Godhavn in the north and Godthaab in the south.

History.—The very frigidity of "Greenland's icy mountains" makes the island of vital concern for meteorological purposes. From its stations the weather of Britain and the whole north Atlantic region can be predicted. And weather knowledge is important for bombing.

Also in Greenland bases can be set up from which to attack or protect Atlantic shipping.

Greenland could no longer live by itself after the start of World War II in 1939. In 1940 people had begun to reread the Monroe Doctrine, had found that it laid a protective mantle over north as well as south, and the U.S. sent a consul to Godthaab.

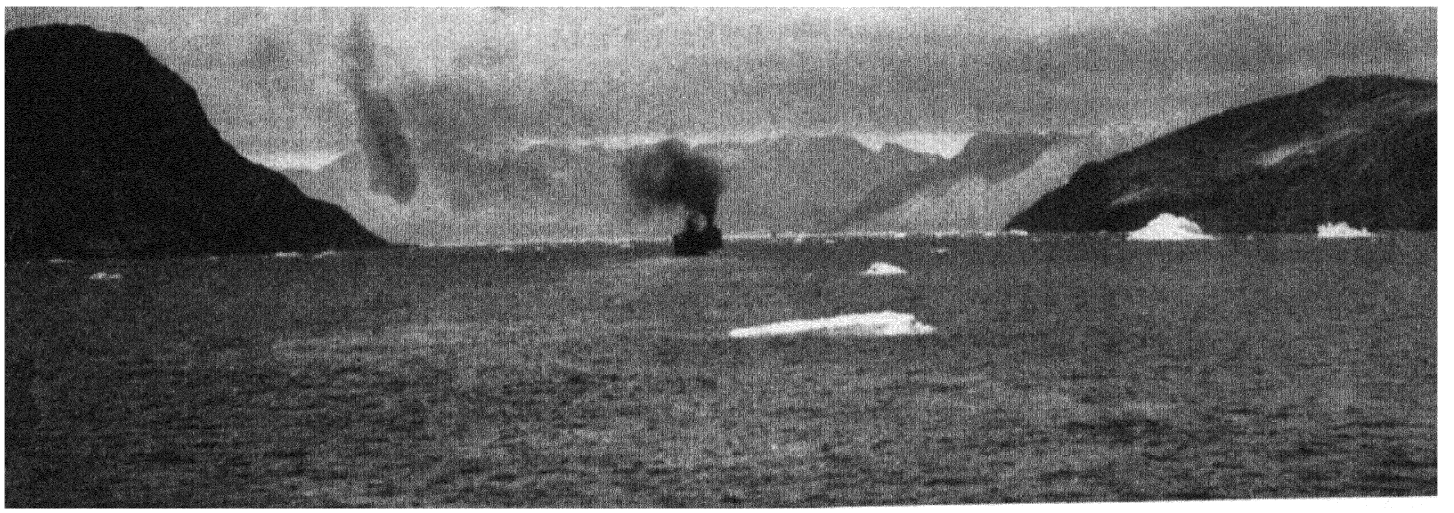
In March 1941 the Germans extended their declared "war zone" to Greenland's three-mile line. A few days later the U.S. consul reported a nazi bomber over Greenland, then another war plane. Within two weeks (April 9) Danish Minister Henrik de Kauffmann signed the following agreement with United States Secretary of State Cordell Hull:

(1) The United States reiterated recognition of Danish sovereignty over Greenland.

(2) The United States obtained the right to build bases for planes, radio and weather stations, and to "do any and all things necessary" to hold these positions.

(3) The agreement was to stand "until the present dangers to the American continent have passed."

GREEK PEASANT TROOPS on the Albanian front in the winter of 1940–41 cooking a meal and warming their hands



A U.S. TROOP CONVOY steamed up a fjord in Greenland early in July, 1941 to land the first forces of occupation, three months after President Roosevelt announced the protectorate April 10, 1941

Virtually, the United States had established a temporary protectorate over Greenland. The Germans roared a protest, and the nazi-controlled government of Denmark voided the agreement and recalled the minister. De Kauffmann, however, stayed on in Washington. He admitted that he had acted without orders, only "in the interests of the king of Denmark," and that the government knew nothing of the agreement until it was a *fait accompli.* The significant fact was that the United States and a "free Dane" official had made a far-reaching decision.

Trade and Finance.—Exports (largely fish and fish products) in 1939 totalled 1,847,000 kronur (1 krón = 18c U.S. in 1939), exclusive of export of 56,455,300 kg. of cryolite. Imports in 1939 totalled 4,149,000 kr. and consisted chiefly of foodstuffs (607,000 kr.), wood (468,000 kr.), manufactures (451,000 kr.), fruits and other colonial wares (389,000 kr.), meat (253,000 kr.).

The government budget for 1939–40 was balanced at 6,035,000 kr.

(F. D. S.)

Grenada: *see* WEST INDIES, BRITISH.

Griffith, John Price Crozer (1856–1941), U.S. pediatrician, was born Jan. 5 in Philadelphia. A graduate of the University of Pennsylvania in 1877, he became a member of the university's faculty in 1889. In 1913 he was appointed professor of pediatrics, a post he held until a short time before his death. Dr. Griffith was also president of the board of trustees of the Baptist orphanage, Crozer Theological seminary, established by his mother's family at Chester, Pa. Among his works are: *The Care of the Baby* (1895); *Diseases of Infants and Children,* published in 2 vols. in 1919 and in one vol. in 1933. Dr. Griffith died at Devon, near Philadelphia, July 28.

Grindell-Matthews, Harry (1880–1941), British scientist and inventor, known as "Death Ray Matthews," was born March 17. After studying under private tutors and at the Merchant Venturers' college, Bristol, England, he saw service with British troops in the Boer war in 1899. Interested in wireless telephony, he built a sending station in Cardiff in 1911 and there established wireless communication for the first time with a plane in flight. Among the many inventions credited to Grindell-Matthews were automatic pilots for planes; submarine detecting devices, 1915–17; and the "luminaphone," an organ played by light, 1926. He was reported to have invented a "death ray" that would bring down aeroplanes at a distance, another ray to kill disease germs and a rocket plane that could travel six miles a second. During later years he was reported working on a scheme for aerial defense by means of "mining the air" with bombs rocketed up 30,000 ft. and suspended from parachutes by thin wires. He died of a heart attack Sept. 11 in his laboratory on a mountain top near Swansea, Wales.

Grindstones: *see* ABRASIVES.

Guadeloupe: *see* FRENCH COLONIAL EMPIRE.

Guam. A possession of the United States of America and the largest and most populous island of the Marianas, Guam lies at the southern end of that group, approximately 1,500 mi. E. from Manila; area about 225 sq.mi.; population, July 1, 1941, 23,394, including 21,994 natives called Chamorros; the remainder are foreign-born or personnel of the naval establishment. Agana, with a population of 11,000, is the capital and only city of Guam, which was occupied by Japanese forces in Dec. 1941.

History.—The island was discovered by Magellan March 6, 1521, and remained a Spanish possession until June 21, 1898, when it was captured by the United States. Later it was ceded to the United States by the treaty of Paris, and after its acquisition was under the jurisdiction and control of the navy department, with a naval officer, commissioned as governor by the president, acting as chief executive of the island.

Guam was attacked from all sides by Japanese naval forces Dec. 8, 1941 (Dec. 7 east of the international date line). It was defended by a small force of approximately 555 U.S. sailors and marines, plus a group of some 1,100 construction workers who seized whatever weapons were at hand. The Japanese made a landing near Agana Dec. 10 and claimed control of the island shortly thereafter. The U.S. navy department acknowledged loss of the island Dec. 13.

Education.—During 1940–1941 the public schools had an average enrolment of 5,082. All instruction was in the English language, with special attention given to health and sanitation and to industrial and agricultural training. Health and sanitary conditions are very satisfactory.

Agriculture.—Typhoon damage to the coconut crop curtailed copra export to 193,391 lb. for the fiscal year 1940–41; the value was $73,763. Total exports were $84,278; imports, $994,010. Guam is an agricultural community; soil is fertile and native foodstuffs plentiful.

Guatemala. Second largest and most northerly of the Central American republics. Area, 48,290 sq.mi.; pop. 3,284,269, of whom 65% are Indians. The chief cities (with 1938 official est. pop.) are: Guatemala City (capital, 166,456); Cobán, (45,919); Quezaltenango (41,858); Totonicapán (40,900); Antigua, (40,000) (unofficial estimate); Jutiapa (31,723); Quiché (30,945); Zacapa (30,113); Jalapa (28,717); Chiquimula (27,581); Escuintla (26,985). President in 1941: General Jorge Ubico.

History.—The year 1941 in Guatemala was dominated by national and hemispheric defense, capped by formal declarations of war on Japan (Dec. 7) and on Germany and Italy (Dec. 11). For the second time since Pres. Ubico's first inauguration in 1931, a constitutional assembly extended the president's term by six years, to March 1949. War preparedness measures included strict licens-

ing of strategic mineral exports, establishment of a school of modern military tactics, deportation of the *Transocean* nazi news agency correspondent in Guatemala, and expulsion of German consuls and withdrawal of Guatemala's from Germany. The United States blacklist of axis firms in Latin America resulted in a boycott of German business, especially of coffee producers, in September. Funds of the German-owned coffee plantations, about half of all the country's total, were "frozen."

Education.—Guatemala had, in 1941, more than 2,500 schools, with an enrolment in excess of 145,000 pupils. The 1941–42 budget for education was $1,077,000, third largest government expenditure.

Defense.—Military service is compulsory. The army, numbering 7,000 men in early 1941, was being increased rapidly. The defense budget for 1941–42 was $1,900,000, the largest single government expenditure.

Finance.—The monetary unit is the quetzal, equal in value to the United States dollar. The 1941–42 budget presumed balancing of revenues and expenditures at $10,223,000. The national debt as of Dec. 31, 1940, was $10,341,000, of which 60% was in sterling bonds, the remainder mostly dollar obligations.

Trade.—In 1940 imports amounted to $12,666,970 (1939: $15,295,729), exports $12,039,000 (1939: $16,985,310). In the first half of 1941, imports declined 12.1%, while exports rose 19.8%. The United States supplied 74% of the imports and took 91% of the exports in 1940. Coffee made up 45% of all export values in 1940, against 56.2% in 1939, bananas (a 20.2% decline) 42.9% (1939: 32.3%), chicle 15,052 quintals (of 101.43 lb.) 5.3% (4.6%), mahogany and other woods 0.9% (1.0%). Honey, vegetable oils, zacatón root and hides followed in importance.

Communication.—Steamship and air service are the chief means of external communication, although the nearly completed Inter-American highway was increasing in importance in 1941. Guatemala had 539 mi. of railway (not including private banana lines) and 6,419 km. of highway in 1941, with 816 km. of highway under construction and 385 km. projected.

Agriculture.—Guatemala, essentially an agricultural country, depends upon two main money crops, coffee and bananas, although chicle is growing in importance. The 1940–41 coffee crop was estimated at 843,480 bags. Under the Inter-American Coffee agreement, a quota of 593,557 bags was placed on 1941–42 exports to the United States (1940–41: 558,593 bags). High winds damaged the banana crop somewhat in 1941, and shipments in the first nine months were reduced some 20% to 5,404,467 stems. The 1941–42 chicle crop, the best in some years, was estimated at 3,800 tons (2,500 tons in 1940–41). In the season 1939–40, the greatest single crop in acreage was corn, 550,999 manzanas (1 manzana = 1.727 ac.), followed by coffee (158,299), beans (105,674), bananas (49,423), wheat (27,576), sugar cane (21,556) and rice (14,581). (*See* also BRITISH HONDURAS.)

(L. W. BE.; M. L. M.)

Guayule: *see* CHEMURGY: *Rubber;* RUBBER AND RUBBER MANUFACTURE.

Guertner, Franz (1881–1941), German jurist and politician, was born Aug. 26. He was minister of justice in Bavaria from 1922 until 1932, when he became reich minister of justice in the von Papen and von Schleicher cabinets. Guertner was reappointed by Hitler in 1933, although he did not become a member of the nazi party until 1937. In 1934 he promulgated a sterilization law for the unfit that was widely applied in ensuing years. Shortly afterwards he inaugurated the People's court to handle cases of high treason and espionage, a court from which there was no appeal. In addition to the professional magistrates this court had 20 lay judges including Storm troop leaders. One of his most far-reaching decrees required German Jews to raise a billion-mark fine in reprisal for the assassination of Ernst vom Rath, a member of the German embassy staff in Paris, by a Jew in Nov. 1938. He died in Berlin, Jan. 28.

Guggenheim, Simon (1867–1941), U.S. industrialist, was born Dec. 30 in Philadelphia, Pa., one of the seven sons of Meyer Guggenheim, founder of the world-famous Guggenheim mining empire. After studying languages and business in Europe, young Simon went to Pueblo, Colo., in 1888 to help manage the family's smelting and refining plants there. While in Colorado, he took an active role in politics and was U.S. senator, 1907–13. In 1919 he became president of the American Smelting and Refining company, and the Guggenheim holdings throughout the world continued to expand under his administration. In 1925, Guggenheim and his wife established the John Simon Guggenheim Memorial foundation to aid scholars, scien-

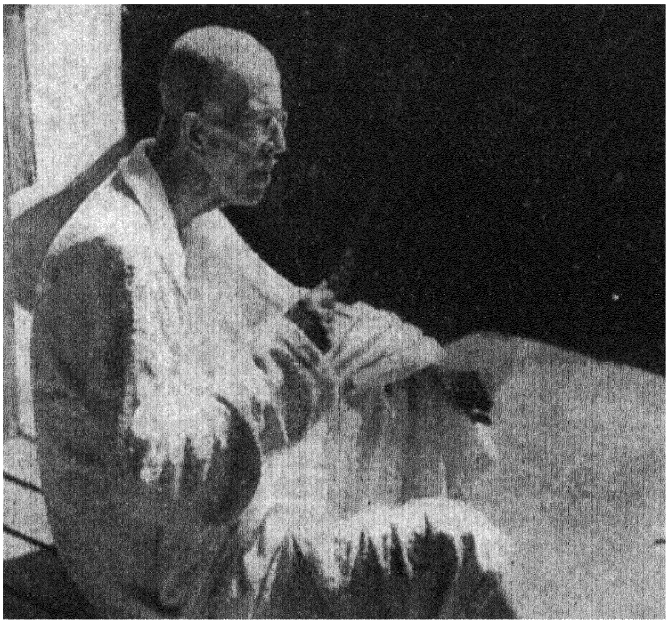
Guggenheim Memorial Foundation. The John Simon Guggenheim Memorial foundation granted 104 fellowships with total stipends of $215,000 for the year 1941–42. Of these grants, 78 were awarded to citizens and permanent residents of the United States, 6 to Canadians and 20 to citizens of Argentina, Brazil, Chile, Cuba, Mexico, Peru, Uruguay and Puerto Rico.

Simon Guggenheim (*q.v.*), cofounder with Mrs. Guggenheim of the foundation in 1925, died Nov. 2, 1941. At the time of his death the foundation had an endowment of $8,314,348, all contributed by Guggenheim and his wife. In the period 1925–41, the foundation granted a total of $2,291,535 for 1,123 fellowships. In his will, Guggenheim left almost his entire estate to the foundation as residuary legatee. No estimate of the probable amount of the bequest was available in 1941. Headquarters of the foundation are at 551 Fifth avenue, New York city.

Guiana, British: *see* BRITISH GUIANA.
Guiana, Dutch: *see* SURINAM.
Guiana, French: *see* FRENCH COLONIAL EMPIRE.
Guinea: *see* FRENCH COLONIAL EMPIRE; PORTUGUESE COLONIAL EMPIRE; SPANISH COLONIAL EMPIRE.

Gunther, Franklin Mott (1885–1941), U.S. diplomat, was born Feb. 28 in New York city and was educated at Harvard and the École Libre des Sciences Politiques in Paris, France. He was private secretary to the U.S. ambassador to Japan in 1908–09 and thereafter served in U.S. embassies and legations in many countries. He was minister to Egypt, 1928–30, retired to devote himself to economic research, 1930–37, and was again named minister, serving in Bucharest, Rumania, from 1937 to 1941. Gunther was president of the American Institute of Iranian Art and Archaeology, 1930–37, and a fellow of the Metropolitan museum, New York city, and the Royal Society of Arts and Manufactures, London. He died at his post in Bucharest, Dec. 22.

Gustavus V (1858–), king of Sweden, of whom a biographical account will be found in the *Encyclopædia Britannica*, ascended the throne in 1907 and in 1941 was Europe's oldest monarch. The nation-wide celebration of his 80th birthday in 1938 was a demonstration of love of the man as



well as of respect for his age. He stood out after 1914 as a leader in the movement for inter-Scandinavian peace and co-operation. But the solidarity meeting held under his auspices in Stockholm in the autumn of 1939 was too late to avert the cataclysm. Throughout 1940 and 1941 he was unquestionably one of the strongest and most consistent influences holding Sweden to a path of neutrality—or at least of nonbelligerency.

(F. D. S.)

Gynaecology and Obstetrics. Mayer says "war amenorrhoea" referred to frequently during World War I had not been demonstrated up to the close of 1941. The apparent decrease in eclampsia during World War I, attributed to decreased protein intake, had not been noticeable. An increase in the incidence of gonorrhoea was noted during both wars.

An outstanding gynaecologic event of 1941 was the release in the United States by the pure food and drugs bureau of stilbestrol for commercial distribution. This synthetic preparation has estrogenic properties or effects, and thus can be used in treatment of menopausal disturbances as a substitute for hormones, extracted laboriously and expensively from animal sources. Its low cost is its chief advantage, as many women suffering from "flashes" and "flushings" of their "change of life" were financially unable to purchase these other necessarily expensive preparations.

A long period of careful clinical investigation before the governmental approval of stilbestrol as a new drug disclosed that certain ill effects, supposedly toxic, were due chiefly to overdosage. This preparation had been available commercially for some time previous to this in Canada and in England.

Endometriosis, or pelvic and intra-abdominal implantation of tissue histologically identical with that lining the uterus, causes extensive and dense formation of adhesions in the lower abdomen, with tubal involvement, and if neglected is followed by sterility and other ailments. It is frequently associated with cystic degeneration of one or both ovaries, and often becomes a ravaging ailment in young women. All gynaecologists agree that its occurrence is increasing. Whereas it was once uncommon, it is seen with constantly increasing frequency in young women between 20 and 35 years of age. It is not common among poor classes of patients. It was suggested in 1941 that its present noticeable increase may be due to late marriage and delayed childbearing, more generally prevalent than formerly.

Liquid petrolatum, or mineral oil, used so extensively as a postoperative lubricant, and for constipation of pregnancy was declared harmful in that it interferes seriously with the utilization of fat soluble vitamins, notably A and D, causes indigestion, interferes with healing of operative wounds in the anorectal region, and contrary to the previous belief that it was merely a lubricant, may be absorbed with resulting symptoms termed "mineral oil poisoning."

Nicodemus recommended oxygen tent therapy to lessen the anoxia and thus lower the maternal and also the infant death rate from eclampsia.

The diagnosis of placenta previa was materially aided both in safety and accuracy by the use of roentgen-ray pictures, utilizing a "soft-tissue" technique, to disclose the location of the placenta. A pregnant woman approaching term may bleed and thus cause her physician to suspect a low implantation of the placenta (placenta previa.) Internal examination for diagnosis is dangerous because this causes further separation and haemorrhage. Innumerable methods have been attempted to visualize the placenta and to determine its location by roentgen-ray, but like other soft tissues the placenta throws little or no shadow to the ordinary roentgen-ray. By means of this new technique it could be quite plainly shown, and diagnosis of placenta previa established or ruled out in nearly all suspected cases.

The relationship between prothrombin activity in the blood of newborn infants, and their likelihood to suffer from bleeding or haemophilic states was studied extensively. The administration of vitamin K to infants with intracranial or other haemorrhages is an active therapeutic measure in increasing the prothrombin activity and thus checking the bleeding. Premature infants are especially prone to such haemorrhages, so that the routine administration of vitamin K to mothers beginning a premature labour was recommended for its prophylactic effect on the premature infant about to be born, transmission of the vitamin taking place readily through the placenta.

Sulphanilamide derivatives, established as a powerful means of combating various infections and used extensively in infections of an obstetric or a gynaecologic nature, were being subjected to an intensive study of their toxic or harmful side effects. In addition to already recognized ill effects, question was raised about their possible injury to the foetus when used for the mother during her pregnancy for some infection, such as a severe pyelitis. It was suggested that foetal anaemia may be caused.

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Gypsum. There was an increase of gypsum production in the United States in 1940 amounting to 15%, and totalling 3,699,000 short tons of crude gypsum; sales, however, increased but 7%, to 929,100 tons, as a larger amount was sold as calcined gypsum, the sales of which rose 15%, to 3,704,100 tons. Imports were mostly from Canada and amounted to 1,405,200 tons, 7% more than in 1939. Crude gypsum is used mostly in the manufacture of portland cement, which took 88% of the sales, while agriculture took 10%; sales of calcined gypsum went 53% to building plasters, 28% for lath, 12% for wallboard and sheathing, and 4% for tile. All told, the building industry consumed 97% of the calcined gypsum and 88% of the crude. During the first three quarters of 1941 production of crude gypsum increased 27% over the same period of 1940, to 3,345,100 tons, while calcined gypsum increased 20%, to 2,890,700 tons. These increases were to be attributed largely to the heavily increased building program in connection with defense work.

The only producer of importance outside of the United States for which data were available was Canada, where the output in 1940 was 1,448,800 short tons, most of which was exported to the United States. During the first three quarters of 1941 production rose 2% over the same period of 1940, to 1,116,847 tons. (G. A. Ro.)

Haakon VII (1872–), king of Norway, of whom a biographical account will be found in the *Encyclopædia Britannica*, was born Prince Charles of Denmark, second son of Frederick VIII (and brother of Christian X). Upon the separation of Norway from Sweden he was elected king by the Norwegian storting (Nov. 18, 1905), and took the old Norse name of Haakon, and that of Olav for his son the crown prince. Haakon married Maud (1869–1938), youngest daughter of King Edward VII of England.

Through 1941 King Haakon continued to head the Norwegian government operating in exile in London. He who had stood aside from internal political strife and who had acted with calm heroism through the harrowing days of April, May and June of 1940 was the kind of steadfast rallying point needed by the citizens of Nor-

way at home and in exile. It was he who, in March 1941, officially welcomed to London the 300 Norwegians brought back after the British raid on the Lofoten islands. And it was he who, in October, took the grimmer step of signing a decree providing the death penalty for "tools of the nazis," a warning aimed to bolster the morale of people at home. (*See* also NORWAY.)

(F. D. S.)

Hackett, Horatio Balch (1880–1941), U.S. architect, was born May 8 in Philadelphia, Pa. He graduated from the U.S. Military academy in 1904 and served with the A.E.F. as an artillery officer in World War I. After the war he joined an architectural firm and in 1934 was appointed general manager of the Federal Public Works Emergency Housing corporation. Col. Hackett was director of housing for the Public Works administration, 1934, and assistant administrator, 1935–37. He also served as a member of President Roosevelt's advisory board on allotments, 1935. Col. Hackett was an executive of several large firms before his death in Chicago, Ill., Sept. 8.

Haiti. A West Indian republic occupying the western third of the island of Hispaniola. Area, 10,204 sq.mi.; pop. (1941, approx.), 3,000,000. Haiti is the most densely populated of the Latin American republics. Capital, Port-au-Prince (125,000). Other principal cities are Cap Haitien (15,000), Les Cayes (15,000), Gonaïves (10,000), Jacmal (10,000) and St. Marc (10,000). Religion, Roman Catholic; president (1941) Elie Lescot.

History.—Politically, the main events in Haiti in 1941 centred about the presidential succession. Despite constitutional prohibition of more than two successive terms for a president, the chamber of deputies in March unanimously re-elected Pres. Stenio Vincent for a third term and suggested a plebiscite to obviate constitutional difficulties. Public opinion, expressed in mob protests, was so strongly opposed, however, that Pres. Vincent stepped aside, and Elie Lescot, long Haitian minister to the United States, was elected, taking office May 15.

Agreements with the United States in May and September achieved relaxation of United States fiscal control in Haiti. The functions formerly exercised by a United States fiscal representative were assumed by the National Bank of Haiti.

In December, Haiti responded to the Japanese attack upon the United States with declarations of war against all the principal axis powers, and placed her facilities at the disposal of the United States.

Economic depression marked the early months of 1941—the effect of loss of export markets because of war conditions. To alleviate the financial crisis which followed, the United States agreed to deferment of a third of interest payments on Haitian bonds due April 1. By September, however, a sharp rise in foreign trade had so enhanced national revenues that the deferred payments were liquidated entirely. On May 1 a United States Export-Import bank grant of $5,000,000 was made to further development of diversified production, especially rubber, along with spices and a variety of tropical medicinal and fibrous plants.

On Sept. 16 "lend-lease" goods valued at $1,100,000 were granted by the United States to aid development of Haitian defenses.

Education.—Haiti had some 400 primary and secondary schools in 1941, with 50,000 enrolment. The University of Haiti is at Port-au-Prince. Education was allotted 8.6% of the 1941 budget.

Finance.—The monetary unit is the gourde, fixed by law at 20 cents U.S. Total revenues in the fiscal year ending Sept. 30 were $5,386,000; expenditures, $5,113,200. The public debt on Sept. 30, 1941, was $13,619,200, an increase of 12.5% over the previous year.

Trade.—Imports for the year ending Sept. 30, 1941 totalled $7,431,200, a 6.7% decline, consisting largely of textiles, foodstuffs and manufactured articles. Exports were $6,657,400, a sharp 23.3% rise, comprising coffee 38.8% (1939–40: 38.0%), bananas 23.3% (11.7%), sisil hemp 13.0% (12.5%), sugar 7.7% (17.5%), cotton 7.0% (11.3%) and cacao 2.1% (1.8%). Imports came largely from the United States 83.58% (1939–40: 73.3%), Great Britain 8.53% (11.78%) and Japan 2.88% (2.79%). These values represented a continuing increase in imports from the United States (1938–39: 62.96%; 1939–40: 73.3%), a small increase for Japan, and a continued decline for Great Britain. Exports were taken by the United States (87.92%), Great Britain (5.95%) and Japan (3.55%).

Communication.—External communication was by sea and air. About 160 mi. of railroad, 1,500 mi. of highway and the Artibonite river, navigable for about 100 mi., provided internal communication.

(L. W. BE; L. C. DE A.)

Halifax, Edward Frederick Lindley Wood, 3RD VISCOUNT (1881–), British statesman. See *Encyclopædia Britannica* for his biography. On Feb. 25, 1938, he succeeded Anthony Eden (*q.v.*) as foreign minister and retained this post through the "Munich era" and through the various reshufflings of the war cabinets of Chamberlain and Churchill. On Dec. 23, 1940 he was named British ambassador to the United States. Halifax arrived in the United States Jan. 24, 1941, aboard the British battleship "King George V" and was personally greeted in Chesapeake bay by President Roosevelt, who escorted the new ambassador to Washington. He presented his credentials Jan. 30. On March 25 he listed as one British war aim world-wide economic co-operation and political freedom after the axis' defeat.

In June he received honorary degrees from Columbia, Harvard and Yale universities. Later he made an inspection tour of aircraft plants on the U.S. west coast. He flew to London in August and returned to his post at Washington Oct. 1.

Hall, Grover Cleveland (1888–1941), U.S. editor, was born Jan. 11 at Haleburg, Ala., and began his career as a printer's devil. He later became editor of the *Montgomery* (Ala.) *Advertiser* and for many years was an active crusader in the cause of tolerance. His editorials in the *Advertiser* denouncing the Ku Klux Klan, flogging, racial hatred and religious intolerance won the 1928 Pulitzer prize for the best editorial writing of the year. He died Jan. 9 in Montgomery, Ala.

Hammer Throw: *see* TRACK AND FIELD SPORTS.

Hand-ball. The classic hand-ball event is the national A.A.U. four-wall championship held every year. In 1941 the Lake Shore club of Chicago was the host with entries representing every section of the United States. The outstanding event of that tournament was the victory in the singles for the seventh consecutive year of Joseph Platak of the Lake Shore club. In the doubles, Frank Coyle and Edward Linz of the New York Athletic club were the winners for the third time.

National Four-Wall Rankings for 1941

Singles	*Doubles*
1. Joseph Platak, Chicago	1. Frank Coyle and Edward Linz, New York
2. Stanley Hitz, Harrisburg	2. Joe Gordon and J. L. Goldsmith, Long Beach, Cal.
3. Ed. Rawlings, Kansas City	3. M. Lappin and Al Zerbo, Detroit

Continued interest was manifested in the one-wall game which is played almost exclusively in the east. New York city has been the scene of all the national tournaments in this branch of the game and is considered to have the best players in the U.S.A.

National One-Wall Rankings for 1941

Singles	*Doubles*
1. Arthur Wolfe, New York	1. Morton Alexander and Marvin Hecht, New York
2. Schin Karrik, New York	2. Jos. Garber and Arthur Wolfe, New York
3. Morton Alexander, New York	3. Leon Block and Samuel Lipsky, New York

Women's Rankings (One-Wall, New York Metropolitan District)

1. Marie Zanetti 2. Lucy Caruso 3. May Okon

(FR. RO.)

Harbours: *see* RIVERS AND HARBOURS.

Harris, James Rendel (1852–1941), British Biblical scholar, archaeologist and orientalist, was born at Plymouth. He travelled widely in search of manuscripts and in 1917 acquired a fragment of the Book of Deuteronomy. Harris was curator of manuscripts in John Rylands library, Manchester, Eng., from 1918 to 1925. He wrote more than 100 volumes, principally on the Bible, and was an authority on Old Testament history. Among his later works were *The Builders of Stonehenge* (1933); *Who Discovered North America?* (1934); *A Temple in Tennessee, Emendations to the Greek of the New Testament* (1935) and *An Egyptian Cat Goddess in Britain* (1938). Harris died in Birmingham, England, March 1. (See *Encyclopædia Britannica.*)

Harris, Sam H. (1872–1941), U.S. theatrical producer, was born Feb. 3 in New York city. After a variegated career as prize-fight manager, athletic promoter and producer of burlesque shows, Sam Harris formed a theatrical partnership with George M. Cohan. Their first play, *Little Johnnie Jones,* in which Cohan sang one of his most famous songs, "Give My Regards to Broadway," was an immediate hit. Together they produced 50 plays, many of which were nation-wide successes. Among some of the better known Harris productions were *The Nervous Wreck, Rain, The Jazz Singer, Animal Crackers, Dinner at Eight, Stage Door* and three Pulitzer prize winners: *Ice Bound* (1923); *Of Thee I Sing* (1932) and *You Can't Take It With You* (1937). He died in New York city, July 3.

Harrison, Byron Patton (1881–1941), U.S. senator, was born Aug. 29 in Crystal Springs, Miss. He studied at Mississippi State university and at Louisiana State university, where he spent his spare time playing semipro baseball. He began law practice in Leakesville, Miss., in 1902, and entered politics in 1905, when he was elected district attorney. In 1910 he was elected to the house of representatives, and in 1918 he won a seat in the senate from Mississippi, a post he held until his death. A staunch New Dealer, he helped pave the way for the NRA bill, the Social Security act and parts of the AAA bill. A conservative in tax measures, he was credited with blocking the "share-the-wealth" tax bill in 1936 and for shelving the undistributed profits tax measure in 1937. He was president pro tempore of the senate after the death of Sen. Key Pittman in 1940. Though suffering ill health during his last months in congress, Sen. Harrison won his last big battle in pushing the Lend-Lease act through the senate. He died in Washington, D.C., June 22.

Hart, Thomas Charles (1877–), U.S. naval officer, was born June 12 in Davidson, Mich. He was graduated from Annapolis in 1897, was commissioned as ensign in 1899 and advanced to the grade of captain in 1918. He served in the Spanish-American War and was a commander of submarines in World War I. He was made a rear admiral in 1929 and took command of the Asiatic fleet in July 1939. Adm. Hart reached retirement age in June 1941, but was kept on duty because, Secretary of the Navy Knox declared, he was "a good man handling a situation in the far east that requires great skill." When the U.S.-Japanese war broke out in Dec. 1941, he was compelled to take up defensive positions in Philippine waters, since the Asiatic fleet was a comparatively light naval force consisting of four cruisers, an aircraft carrier and a dozen each of destroyers and submarines.

Harty, Sir Herbert Hamilton (1880–1941), Irish composer and conductor, was born Dec. 4 at Hillsborough, County Down, Ireland. He was conductor of the Hallé orchestra in Manchester from 1920 to 1933 and also conducted many other leading English orchestras. He toured the United States as guest conductor, and in 1934, following an extensive tour of Australia, he went to Chicago to conduct special concerts at the Century of Progress exposition. Among his compositions are: "A Pianoforte Concerto in B Minor" and "The Children of Lir" for orchestra. He died at Brighton, England, Feb. 19. (See *Encyclopædia Britannica.*)

Harvard University, oldest institution for higher education in the United States, completed the fifth year of its fourth century in 1941. At the end of the fiscal year, June 30, 1941, investments exclusive of land, buildings and contents used for educational purposes stood at $157,000,000. Gifts during the year were $6,188,659 for capital account and $1,689,953 for immediate use.

Scholarships and other student aids totalled $735,444, exclusive of student loans. The scholastic year 1941–42 began with an enrolment of 7,214 full time students and a faculty and educational administrative staff of 1,930. Student enrolment fell about 10%, due to conscription and enlistments, chiefly in the graduate schools. The university library, largest university library in the world, had 4,265,792 volumes and pamphlets on June 30, 1941.

Harvard's new graduate school of dental medicine opened in the fall of 1941, offering a five-year course in dental education leading to the degrees of M.D. and D.M.D. under a revolutionary new plan. The law school introduced a two-semester system due to the national emergency. The university made special regulations for students leaving for military service or other national defense service during the academic year. At the business school an intensive 12-month course was opened to train men for defense industrial management. Another new course to train graduate students for quartermaster duty was introduced at the business school. New provisions were made by the college for commuting freshmen so that they now had studies in the freshman dormitories and might lunch with their resident classmates.

Hawaii. The territory of Hawaii consists of a group of eight larger islands and numerous islets in the Pacific ocean between latitudes 18°55′ and 22°15′ N. and between 154°50′ and 160°30′ W. longitude. Their total area is 6,438 sq.mi. The islands are of volcanic origin. From southeast to northwest, they are Hawaii, Kahoolawe, Maui, Lanai, Molokai, Oahu, Kauai, Niihau. In addition, stretching northwestward beyond Niihau over 1,100 mi. is an archipelago of rocks, reefs and shoals which includes Midway (*q.v.*) (longitude 177°22′ W.), notable as the first stop beyond Honolulu of the China clipper planes. Likewise, 960 mi. south of Honolulu and a part of the city and county of Honolulu lies Palmyra, a coral atoll consisting of 55 islets, five miles long and two and a half miles wide. The youngest island, geologically, and the largest in the group is Hawaii, with an area of 4,030 sq.mi. (*See* map on page 325.)

The capital of the territory is Honolulu, situated on the island of Oahu. It is a completely modern city with a population (1940 census figures) of 180,986. The population of Hawaii (1940 census figures) is 423,330.

The racial origin of this population, in addition to the native Hawaiians and Caucasians from the mainland, is Japanese, Chinese, Korean, Filipino, Portuguese. However, 82% of the population is native born.

History.—The governor in 1941 was Joseph B. Poindexter; and the delegate, Samuel W. King. The territory collected in taxes and fees $17,064,934.67 in 1941, and expended $16,387,698.43. In addition, federal taxes paid into the United States treasury

EMERGENCY HOSPITAL in Honolulu burning Dec. 7, 1941, after it had been struck by Japanese high-explosive and incendiary bombs

exceed the payment of many states of the union.

The Japanese attack on Pearl Harbor, Honolulu and Hickam field early in the morning of Dec. 7, 1941, was the signal for U.S. entrance into World War II. This treacherous assault, which admittedly took the U.S. navy unawares, caused considerable damage to the Pearl Harbor base and to planes and equipment at Hickam field. One battleship was sunk and another capsized; three destroyers, a minelayer and a target ship were also lost. After this initial blow, however, the Japs did not return to attack Hawaii during the rest of 1941, except for intermittent and harmless shelling of Maui and Johnston Island on Dec. 15–16. (*See* also WORLD WAR II.)

Agriculture.—Hawaii's chief crops are sugar and pineapples. Expert management, scientific methods and costly irrigation works raised the sugar production to a maximum of 1,035,548 tons in 1933 with a value of $66,482,181. The value of the sugar shipments in 1940 was $47,266,417. The pineapple industry, next in importance, produced fresh and canned pineapple and pineapple juice valued at $45,899,359. Other agricultural crops are coffee, macadamia nuts, papayas and taro, a root which is used by the natives in making the native "poi" and which also is processed into flour. (G. J. S.)

Hawley, Willis Chatman (1864–1941), U.S. congressman, was born May 5 near Monroe, Ore., the son of a farmer. He attended rural schools and graduated from Willamette university at Salem, Ore., in 1884. He returned to his alma mater as a mathematics professor in 1891 and two years later he was made president of the school. In 1906 he was elected on the Republican ticket to the house of representatives, holding his seat through successive elections until 1932. A leading advocate of a high protective tariff, he was the co-author, with Sen. Reed Smoot (*q.v.*), of the Smoot-Hawley Tariff act enacted in 1930. The act was held by some to be responsible for the ensuing slump in U.S. foreign trade and was sharply criticized as a measure inimical to farming and trade interests.

Hawley, however, defended the bill as "an alert guard protecting U.S. industries and labour against unfair competition and unfair trade practices . . ."

He was defeated in the Democratic landslide of 1932. Hawley died in Salem, Ore., July 24.

Hawthornden Prize: *see* LITERARY PRIZES: *Great Britain.*

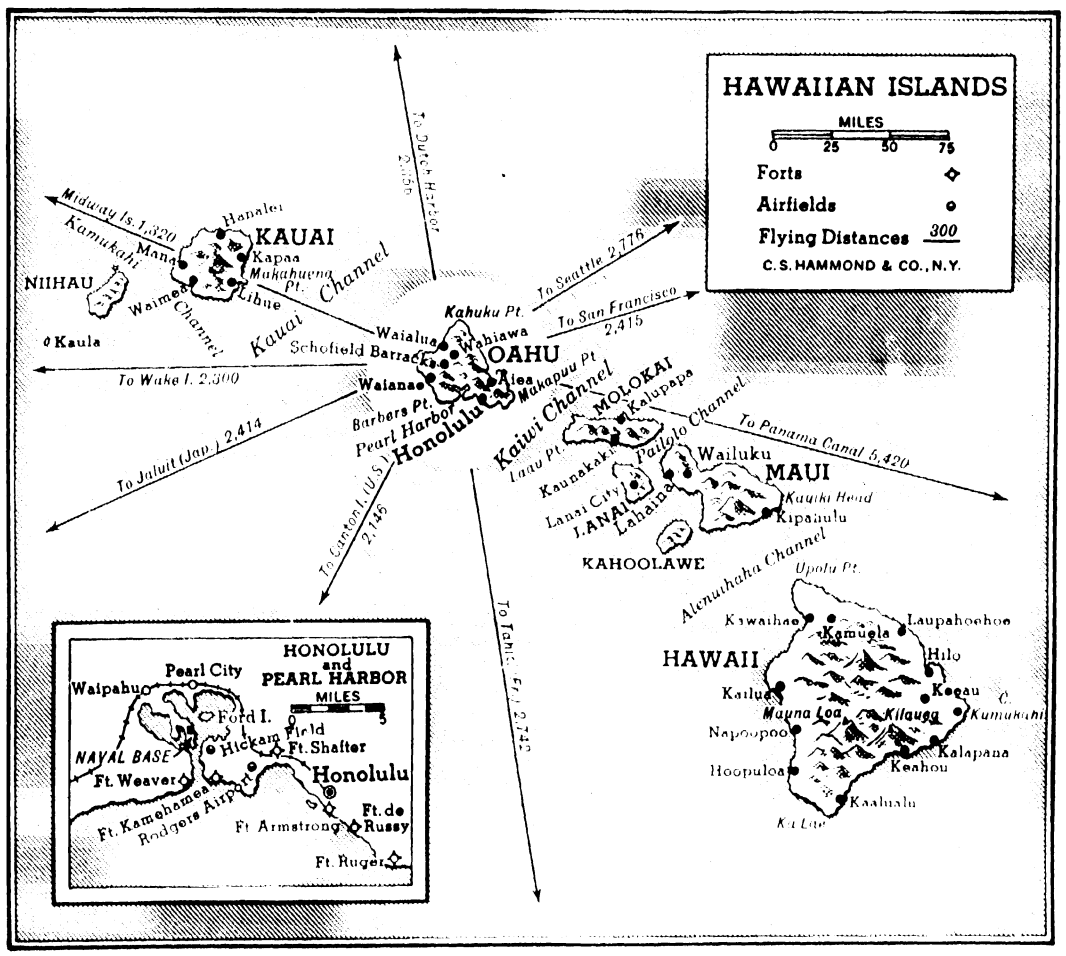
Hay. The United States hay crop in 1941 was 94,107,000 tons from 71,893,000 ac. The all-time record crop of 98,151,000 tons in 1927 was only 4·3% larger than the 1941 crop which, the U.S. department of agriculture reported, was composed of one-third alfalfa, one-fourth clover-timothy, one-sixth legumes and one-fourth wild hay and lesser varieties of tame hay. The 1940 crop was 94,541,000 tons from 71,806,000 ac.; the ten-year (1930–39) average was 78,733,000 tons from 67,893,000 ac., including two historic drought years. The yield in 1941 was 1·31 tons per acre; it was 1·32 tons in 1940 and averaged 1·16 tons per acre for the ten-year period. All tame hay totalled 82,358,000 tons from 59,232,000 ac. in 1941; in 1940, all tame hay, 85,076,000 tons from 60,172,000 ac.; the ten-year average, 69,650,000 tons from 56,102,000 ac.; the tame hay yield, 1·39 tons per acre in 1941, and 1·41 tons in 1940 with a ten-year average of 1·24 tons per acre. The wild hay crop of 1941 was 11,749,000 tons from 12,661,000 ac., compared with 9,465,000 tons from 11,634,000 ac. in 1940 and a ten-year average of 9,083,000 tons from 11,791,000 ac. The wild hay yield in 1941 was 0·93 tons per acre; it was 0·81 tons in 1940 and averaged 0·76 tons per acre for the ten-year period. Clover-timothy production was 23,106,000 tons from 19,176,000 ac. in 1941, compared with 26,682,000 tons from 19,961,000 ac. in 1940 and a ten-year average of 24,587,000 tons from 22,363,000 ac. The clover-timothy yield in 1941 was 1·20 tons per acre; it was 1·34 tons in 1940; and an average of 1·10 tons per acre for the ten-year period. Cowpeas for hay in 1941 totalled 1,614,000 tons from 1,941,000 ac., a decrease from the 1,720,000 tons (2,010,000 ac.) of 1940. The ten-year average of cowpea hay was 1,660,000 tons from 1,961,000 ac. Peanuts for hay in 1941 were 987,000 tons from 1,894,000 ac.; 1,051,000 tons from 1,967,000 ac. in 1940; and a ten-year average of 715,000 tons from 1,528,000 ac. Soybeans for hay were reduced because of a diversion of acreage to soybean oil; 1,710,000 tons from 3,649,000 ac. in 1941, and 2,101,000 tons of hay from 4,916,000 ac. in 1940; the ten-year average, 728,000 tons from 3,304,000 ac. Lespedeza hay produced 5,521,000 tons from 5,413,000 ac. in 1941, compared with 5,025,000 tons from 4,989,000 ac. in 1940 and a ten-year average of 1,709,000 tons from 1,696,000 ac. Sweet-clover hay, 1,277,000 tons in 1941 from 972,000 ac.; 900,000 tons in 1940 from 750,000 ac.; ten-year average, 884,000 tons from 815,000 ac. (*See* ALFALFA; SOYBEANS.)

U.S. Production of All Kinds of Hay in Leading States, 1941 and 1940

State	1941 tons	1940 tons	State	1941 tons	1940 tons
Minnesota	6,942,000	6,112,000	Colorado	2,310,000	1,922,000
Wisconsin	6,907,000	6,977,000	Kansas	2,221,000	1,619,000
Iowa	5,721,000	6,498,000	Tennessee	2,182,000	2,006,000
California	4,846,000	5,067,000	South Dakota	2,090,000	1,731,000
New York	4,230,000	5,733,000	Washington	1,969,000	1,692,000
Nebraska	3,785,000	2,406,000	Oregon	1,917,000	1,876,000
Illinois	3,643,000	4,262,000	Kentucky	1,815,000	1,720,000
Missouri	3,554,000	3,720,000	Oklahoma	1,716,000	1,555,000
Ohio	3,329,000	3,847,000	Arkansas	1,648,000	1,627,000
Michigan	3,308,000	4,050,000	Texas	1,551,000	1,667,000
North Dakota	3,198,000	2,501,000	Wyoming	1,342,000	1,088,000
Pennsylvania	2,882,000	3,427,000	Mississippi	1,280,000	1,181,000
Indiana	2,435,000	2,812,000	Virginia	1,264,000	1,504,000
Idaho	2,391,000	2,415,000	Utah	1,229,000	1,112,000
Montana	2,318,000	2,160,000	North Carolina	1,091,000	1,044,000

(S.O.R.)

Hayes, Sir Bertram Fox (1864–1941), British sea captain, was born April 25 at Birkenhead, England. In his youth he signed on a sailing ship and spent nine years aboard windjammers. In 1889 he entered the service of the White Star line. His first command, the "Britannic," carried 37,000 troops to Africa during the Boer War. He was decorated by King Edward VII with the Transport medal. During World War I he commanded the "Olympic" and successfully ferried 300,000 troops, mostly Americans, across the Atlantic without an accident. Twice encountering submarines during these perilous crossings, Sir Bertram sank one by gunfire and the other by ramming. He retired from active service in 1924 and became a director of the White Star line. His autobiography, *Hull Down: Reminiscences of Windjammers, Troops and Travellers,* was published in 1925. He died at his home, Crosby, Liverpool, Eng., on May 15.



MAP OF THE HAWAIIAN ISLANDS, with inset showing Pearl Harbor, Honolulu and Hickam field, principal targets of the Japanese attack of Dec. 7, 1941

Hazen, Charles Downer (1868–1941), U.S. historian, was born March 17 at Barnet, Vt. He graduated from Dartmouth in 1889 and studied at Johns Hopkins and at the universities of Goettingen, Berlin and Paris. He was a professor of history at Smith college, 1894–1914, and at Columbia university, 1916–37. Retiring in 1937 from the Columbia faculty, he became professor

emeritus of European history. Hazen was widely known as an authority on the French Revolution. His publications include: *Contemporary American Opinion of the French Revolution* (1897); *Europe Since 1815* (1910, revised 1923); *Modern European History* (1917); *The French Revolution and Napoleon* (1917); *Alsace-Lorraine under German Rule* (1917); *The Government of Germany* (1917); *Fifty Years of Europe, 1870–1919* (1919); *Modern Europe* (1920); and *The French Revolution* (1932). Hazen died in New York city, Sept. 18.

Hearing Aids: *see* DEAFNESS.

Heart and Heart Diseases. Although physiologists have studied normal men and animals as individuals with their interrelationships of many organs they have not analyzed large enough series of human beings to be able to tell adequately the range of the normal. During the past few years it has steadily become more and more apparent that errors of diagnosis, not of omission but of commission, have been common and increasingly so (with the development of more and more methods of examination), due to labelling as disease findings by symptom, sign, X-ray or electrocardiogram which are in reality variations of the normal but which had been previously unrecognized as such. Hence some have become intensely interested in the range of the normal heart at all ages and in all its relationships and methods of study (White, 1941), and are spending much time reversing diagnoses of heart disease.

One of the methods of study of the heart introduced years ago but disappointing in its accomplishments is the graphic record of heart sounds and murmurs, called phonocardiography. The reason for its unsatisfactory clinical application was due to ignorance about fundamental concepts. Now that co-ordinated studies are in progress by doctors interested in auscultation working with acoustical engineers, important progress has been made (Sprague and Rappaport, 1941).

The reason for the difficulty in the past was the failure to differentiate between records of the coarse vibrations of the chest wall itself (linear phonocardiogram, essentially the old "mechanical cardiogram"), mostly inaudible to the human ear, and the vibrations picked up and transmitted by the stethoscope to the microphone (called the stethoscopic phonocardiogram), some of which are inaudible to the ear, and finally, the vibrations that are actually within the human audiogram range (called the logarithmic phonocardiogram) with a filtering out of the vibrations above and below the human range and amplification of those within the range to accord with what the average trained physician can hear. Thus with the logarithmic phonocardiogram, which accords with the human audiogram, at last a graphic record of auscultatory findings is available.

This does not mean, however, that there is no place for the other two types of phonocardiogram, since it is quite possible, in fact probable, that vibrations that are inaudible still have an importance in the mechanism of the heart both in disease and within the range of normal.

Other developments, in 1941, in the study and treatment of heart disease itself, not spectacular but important, were (a) further confirmation of the special role of haemolytic streptococcus infections (mostly of the upper respiratory tract) in the initiation of rheumatic fever (even in epidemic form) and their control, in part at least, by the prophylactic use of the sulphonamide drugs in children (Coburn; Thomas, France and Reichsman); (b) further study of the specific hypotensive effect of renal extracts in the serious and common, and hitherto incurable, disease called essential hypertension (high blood pressure of unknown cause) which, though still in the experimental stage, gives much promise (Page *et al.*; Harrison *et al.*); and (c) continued development of the two surgical measures that have demonstrated their permanent value as curative therapy, namely, pericardial resection for chronic constrictive pericarditis (Harrison and White), and ligation for patency of the ductus arteriosus (Gross).

Selective Service Rejections.—In the examination of drafted men for the army, it was found that the percentage of rejections for cardiovascular abnormalities among the total rejections varied in different areas of the U.S. from 5% to 13%, averaging fifth among the various causes.

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Heckscher, August (1848–1941), U.S. philanthropist and real estate operator, was born Aug. 27 in Hamburg, Germany, the son of a German diplomat and statesman. He emigrated to the United States in 1868 and joined a wealthy branch of his father's family who took him into their coal business. He later went into the zinc business where he made and lost a fortune. In the early 1900s he invested in real estate in New York city and made another fortune. At that time he became interested in philanthropy and built the Heckscher foundation for children. Continuing his welfare work, he built camps and parks for the city's poor and was active in many campaigns to do away with New York slums. He died at his winter home in Mountain Lake, near Lake Wales, Fla., April 26.

Hejaz: *see* ARABIA.

Helium. The Cliffside (Texas) gas field in the fiscal year ending June 30, 1940 produced 547,674,000 cu.ft. of helium-bearing natural gas, which went to the plant at Amarillo, operated by the U.S. government for the recovery of the contained helium. The recovered helium totalled 9,450,855 cu.ft., of which 3,531,410 cu.ft. went to the navy department, 2,624,335 cu.ft. to the weather bureau, and 1,514,155 cu.ft. for medical, scientific and commercial use, besides unreported amounts delivered to other agencies of the government. Aside from the original use for the inflation of aircraft, the most important development is in the inflation of observation balloons by the navy, army and weather bureau.

Along medical lines, research continued on the use of helium-oxygen mixtures in caisson disease, in the alleviation of breathing difficulties in respiratory diseases, and in the use of helium to dilute anaesthetics, to prevent fires and explosions. The larger output during the year made it possible to reduce prices of helium to all consuming agencies, and production in the 1942 fiscal year was expected to reach 12,500,000 cu.ft., as compared with the 1941 delivery capacity of 20,000,000 cu.ft. from the gas wells in use, and of 24,000,000 cu.ft. for the recovery plant. Funds were appropriated to raise the well production capacity to that of the recovery plant. (G. A. Ro.)

Henderson, Leon (1895–), U.S. economist, was born in Millville, N.J. on May 26. In 1917 he entered the U.S. army as a private, attaining the rank of captain of ordnance by 1919. In 1920 Henderson returned to Swarthmore

college, where he received his B.A. degree. He was assistant professor of economics at Carnegie Institute of Technology, 1922–23, and was director of consumer credit research for the Russell Sage foundation in New York city, 1925–34. During the New Deal era, he served as consulting economist to the Work Projects administration.

On April 11, 1941 the Office of Price Administration and Civilian Supply (later renamed the Office of Price Administration, *q.v.*) was created by President Roosevelt to check the rise in prices caused by the defense program, and Henderson was placed at the head as price administrator. In July 1941 Henderson, who had been a Securities and Exchange commissioner since 1939, resigned this post to devote himself to his new task. Long a foe of monopoly, he frequently assailed the "business as usual" attitude of big industry, declaring it was not consistent with the nation's defense program. He put strong price curbs on metals and other basic materials needed by the armed forces but urged even more rigid controls to check the inflationary trend.

On Dec. 26, 1941, after the U.S. entered World War II, he strictly rationed motor-car tires and on Jan. 2, 1942, he announced that all motor-car production for civilian use would be halted "for the duration."

Hershey, Lewis B. (1893–), director of U.S. selective service system (*q.v.*), was born on a farm near Angola, Ind.; attended, taught public schools and was graduated from Tri-State college at Angola. Entering the Indiana national guard in 1911, he went to the Mexican border with his unit in 1916, and to France with the 137th field artillery in 1918 as a captain. On his return to the United States after the war, he passed the examination for a commission in the regular army. He was stationed at Fort Sill, and later at Ohio State university where he was assistant professor of military science and tactics for four years. He was at the command and general staff school at Ft. Leavenworth, Kan. for two years, and then at the Army War college in Washington.

Subsequently he was sent to Hawaii for two years and upon his return to the United States in 1937 was appointed to the joint army and navy selective service committee as executive secretary. He was largely responsible for laying the foundation of the selective service system as authorized by the National Defense act of 1920, and for setting up the operating machinery for its organization when it was authorized by the Selective Training and Service act of 1940.

In recognition of this work he was raised to the rank of brigadier general in Nov. 1940 and was appointed director of selective service by the president on July 31, 1941 and confirmed by the senate on the same day. (E. M. Cn.)

Hess, Rudolf Walther (1894–), German politician, christened Richard Rudolf, was born April 26 at Alexandria, Egypt, the son of a German importer. He studied in Switzerland and Godesberg, Germany. During World War I, he enlisted in the German army, saw heavy fighting at Verdun, and met Adolf Hitler on a French battlefield. After the war Hess became Hitler's personal aide in the fledgling nazi party. They fought side by side in the abortive Munich beer hall putsch of 1923 and were imprisoned together.

In 1925 Hess became Hitler's personal secretary and served his fuehrer with unswerving loyalty during the critical years of the nazi party's rise to power. Hess reorganized and "cleansed" the nazi party so well that the fuehrer made him his personal representative in all party matters, as well as a member of the secret cabinet. On May 10, 1941 Hess flew to Scotland, made a parachute landing near Glasgow and was held incommunicado by the British

"LOOK WHO SAYS HESS IS CRAZY." Comment of Thomas in the *Detroit News* on the flight of Hitler's deputy to Scotland May 10, 1941

authorities. Nazis tried to explain his flight on grounds that he was suffering from "hallucinations and a mental disease."

Rumour had it that Hess flew to Scotland in the role of a peacemaker, but the British government failed to offer an official explanation in 1941.

Higginson, Mary Potter Thacher (1844–1941), U.S. poet and author, was born Nov 26 in Machias, Me. Her first book, *Sea Shore and Prairie*, was published in 1876. After the death of her husband in 1911, she wrote his biography, *Thomas Wentworth Higginson, The Story of His Life*. In 1929 she published *Fugitives*, a collection of poems. She died Jan. 9 at her home in Cambridge, Mass.

Highways: *see* Roads and Highways.
Highway to Alaska: *see* Roads and Highways.

Hilferding, Rudolf (1877–1941), German statesman, was born Aug. 10 in Vienna, Austria. Hilferding, who was finance minister in two German Social Democratic governments, fled to France when Hitler came to power in 1933. He was arrested during the German invasion of France in 1940, but later was released. He was kept under constant police surveillance, however, and he was again imprisoned by the nazis in Feb. 1941. A dispatch from Berlin dated Sept. 17 said that Dr. Hilferding had been found hanged in his prison cell "somewhere in occupied France." (See *Encyclopædia Britannica.*)

Hill, Sir Arthur William (1875–1941), British botanist, was born Oct. 11. He attended King's college, Cambridge, and was a lecturer in botany at Cambridge, 1905–07. Sir Arthur was assistant director of the Royal Botanic gardens at Kew, 1907–22, and director from 1922 until his death. He travelled widely in pursuit of his interests in botany and wrote many scientific papers. He was a fellow of the Royal and Linnaean societies and an honorary member of the New York Academy of Arts and Sciences. He was knighted in 1931 and received the Veitch gold medal of the Royal Horticultural

society, 1937. He was killed in an accident while horseback riding in London, Nov. 3.

Hill, Robert Thomas (1858–1941), U.S. geologist, was born Aug. 11 in Nashville, Tenn. Orphaned at five, young Hill left school at 15 to work as typesetter for his brother, a newspaper publisher in a small Texan town. His accidental discovery of a fossil shell aroused his interest in geology and he went to Cornell university to study the subject. After graduating in 1886, he was offered a post with the U.S. geological survey, remaining with this branch of the service until 1930. He also served as palaeontologist for the Smithsonian institution, 1885, and as geologist of the Arkansas geological survey, 1888–90.

He explored, together with Prof. Alexander Agassiz of Harvard, strata of the American-Caribbean region. Dr. Hill died in Dallas, Tex., July 28.

Hillman, Sidney (1887–), U.S. labour leader, was born at Zagare, Russia, on March 23, the son of a merchant. In his youth he studied to become a rabbi, but left school to work in a chemical laboratory in Kaunas. In 1907 he migrated to the United States, where he worked first as a clerk, then as a garment cutter. In Chicago he interested himself in labour unions, led a successful strike in a clothing house and by 1915 was president of the Amalgamated Clothing Workers of America. He went to Washington in the early days of the New Deal and became a member of the labour advisory board of the NRA. He served on the National Industrial Recovery board in 1935, and the next year, as treasurer of Labor's Non-Partisan league, campaigned vigorously for the re-election of President Roosevelt. Later he was a member of the textile and clothing industry committees for the Fair Labor Standards board and was elected vice-president of the Congress of Industrial Organizations. Upon the organization of the advisory commission to the council of national defense May 28, 1940, Hillman was named commissioner of employment. With William S. Knudsen (*q.v.*) he became a prominent figure in U.S. defense activity Jan. 7, 1941, when President Roosevelt appointed him associate director general of the Office of Production Management (*q.v.*). In this office, throughout 1941, Hillman had much to do with the prevention and settlement of defense strikes. He also formulated plans for labour replacement in industries such as silk which were disrupted by the defense program. On Aug. 28 he was named to represent labour on the Supply Priorities and Allocations board (*q.v.*). The split between Hillman and John L. Lewis was not healed during 1941, and pro-Lewis forces drafted resolutions for the C.I.O. convention which sought Hillman's removal from his position with OPM.

Hintze, Paul von (1864–1941), German admiral, diplomat and onetime aide-de-camp to Kaiser Wilhelm II, was born Feb. 13 at Schwedt-on-the-Oder, Germany. The kaiser frequently explained to friends visiting him at Doorn that Admiral von Hintze, who was foreign minister in 1918, urged his abdication on grounds that Germany could obtain better peace terms from the Allies. After the armistice, the admiral quit the diplomatic arena to live in retirement. He died in Berlin, Aug. 23. (See *Encyclopædia Britannica.*)

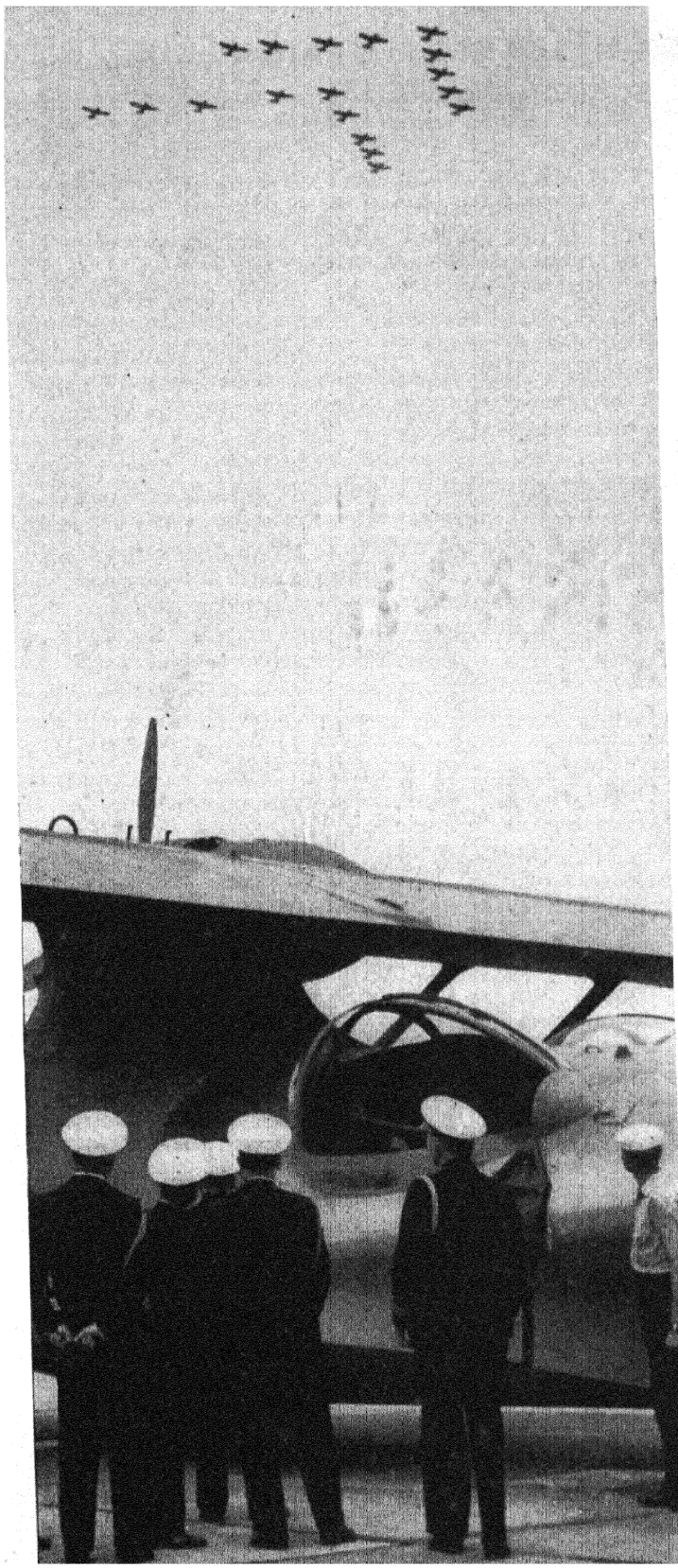
Hispanic America: *see* ARGENTINA; BOLIVIA; BRAZIL; BRITISH GUIANA; BRITISH HONDURAS; CHILE; COLOMBIA; COSTA RICA; ECUADOR; FRENCH COLONIAL EMPIRE; GUATEMALA; HONDURAS; NICARAGUA; PANAMA; PARAGUAY; PERU; SALVADOR, EL; SURINAM; URUGUAY; VENEZUELA.

Hispanic America and World War II. During 1941 World War II (*q.v.*) continued to affect Hispanic America with increasing intensity. The stunned paralysis which characterized Hispanic America through the first year and a half of the war gave way in 1941 to a positive policy of action in the face of an ever-growing peril. The year was marked, therefore, by a crystallizing of opinion as the Hispanic nations of the new world, in company with the United States, took long steps on the road toward continental solidarity. Although the goal was still unachieved as the year closed, very definite progress had been made on the economic, political and defense fronts. These three aspects, while distinct, were nevertheless closely interrelated.

Economically, the disruption of earlier periods of the war continued, but was materially abated as readjustment was made and as war demands for strategic materials tended generally to stimulate economic activity. The most serious continued lacks were of fuel for industrial needs (all the more acute, because of increased domestic industrial production) and of shipping space. Action of Chile, Argentina, Brazil and others to acquire axis ships tied up in their harbours was at best palliative. Generally, the United States continued to supply an increasingly greater proportion of imports, as warring nations sharply reduced their own exports, and to take a considerably larger volume of Hispanic-American exports, with Great Britain remaining the only important European purchaser. Hispanic-American exports to the United States in the second year of war totalled $838,322,000, imports from that country $785,723,000, increases of 78·7% and 60·3% respectively over the year ending Aug. 31, 1939. Accelerated trade with the United States was especially noteworthy in Argentina. Full expansion of United States trade was hampered, however, by priorities imposed within that country. Japanese trade was likewise of considerable significance as Japan piled up reserves of key commodities, notably cotton and metals. Japanese buying was curtailed, however, when the United States (and some of the Hispanic-American states as well) froze Japanese credits. To obtain strategic materials for its own needs, as well as to keep them out of axis hands, the United States contracted with Mexico, Peru, Brazil and other countries—in return for an absolute ban on export of certain materials beyond the hemisphere—to buy any surpluses which might remain. In all this, the Hispanic-American republics benefited economically. To finance carried-over surpluses, and purchases from the United States for which no exchange was available, and to stabilize currencies reeling from the impact of war, the United States Export-Import bank extended credits to almost every republic. Other credits went for highway construction and other public works of potential advantage to hemisphere defense. Under war conditions, too, trade among Hispanic-American countries was notably expanded.

Direct economic effect, too, of World War II was felt in the trend toward economic diversification and stress upon noncompetitive commodities for export to the United States, thus replacing lost European markets. Rubber and rubber substitutes (as guayule in arid northwestern Mexico) were notable illustrations. Although achievement was still in the blueprint, or, at best, the seedling stage, definite progress was nevertheless made in several countries—Costa Rica, Mexico, Brazil, the Dominican Republic. Brazil emphasized the previously unexploited babassu palm nut as a source of vegetable oil and a possible automotive fuel, and pressed exploitation of the oiticica palm as a tung oil substitute. For the second year Paraguay exported tung oil in quantity. Cuba expanded manganese production, and in Argentina, mining assumed appreciable stature for the first time, with a three-year United States contract for the entire tungsten output.

Stirred by the spread of war, Hispanic America took steps



THE CHIEF-RANKING NAVAL OFFICERS of ten Latin American countries inspected the Norfolk naval air station during their goodwill tour of U.S. shipyards in May 1941

toward improvement of its defenses—usually under the leadership of the United States, or at least with its aid. These measures took the form of increased military establishments, improved training, development of bases for hemisphere defense, and finally of co-operation in general defense, although policies and procedure varied from country to country. Without exception every republic at least enacted legislation to increase its defense personnel and equipment.

United States military and naval missions continued to train ersonnel, in some cases replacing Italian and other missions, hile many officers went to the United States for special training r for observation of methods and tactics. This collaboration was specially noteworthy in Mexico. Argentina, on the other hand, s a rule held aloof. It protested a proposed Uruguayan grant) the United States of facilities for an air-naval base which ould serve to defend the South Atlantic. Air bases in Brazil, hose vulnerability was rendered acute by closeness to nazi-dom- ated Dakar (*q.v.*) in West Africa (1,600 mi.), were granted by ie Brazilian government under the cloak of concessions to the an American Airways. Other than airport facilities granted by anama in March, no actual direct grants of bases to the United tates were made during 1941, however. Rumours of such grants y Chile and Ecuador did not materialize, in the opinion of some bservers because of possible adverse effect upon public opinion.)irect aid for defense, on a "lend-lease" basis, however, was iven several countries by the United States. Brazil's genuine oncern over the threat from overseas was well illustrated by her ollaboration with the United States in its measures to protect urinam (*q.v.*).

All the Hispanic American republics felt the effect of pro-axis ropaganda during the year. An axis-inspired revolt in Bolivia as thwarted in May, as were well laid plans in Argentina, involv- ig also Chile, Brazil and Uruguay, in September by the Damonte aborda investigation. In several instances, flagrant violations f diplomatic immunity were met by sharp action from the coun- y affected. Thus, in September, El Salvador severed relations ith Italy, while Panama, resenting derogatory remarks of the pro- xis Spanish ambassador, expelled him in November. Formal and ll but unanimous demand for expulsion of the German ambassa- or was made by the Argentine chamber of deputies. Public opin- n throughout Hispanic America was, by and large, overwhelm- igly anti-axis, although entry of the U.S.S.R. into the war mpered the support of strong Roman Catholic elements, espec- ally in Ecuador. Government policies, however, were conditioned y internal political considerations, notably in Argentina and hile, and by the boundary conflict between Ecuador and Peru. he situation was further complicated by the presence in Brazil, rgentina, and above all in Chile, of important Germanic popula- on elements which were either inclined toward nazi dogma or ere under special pressure from axis agents, by fears—skilfully layed upon by those agents—that axis victory would bring retri- ution, and by traditional dislike or distrust of the United States nd jealousy of any interference or implied leadership from the utside. The last was temporarily heightened by publication of a nited States blacklist of axis nationals and firms doing business n various Hispanic American countries and nationals associated ith them.

In general, the Argentine government, under Acting President astillo, tended to be anti-United States, although not pro-axis. araguay, dominated by rampant militarism; Chile, strongly na- onalistic and inclined toward international isolationism, and Panama under President Arias, were, along with Argentina, the least co-operative in hemisphere defense. On the other hand, Uruguay, long South America's leading champion of Pan Americanism, and Colombia, the continent's best example of democracy in practice, were, with Venezuela, actively friendly toward the United States. So, too, were the Central American and Caribbean states, and, strikingly, Mexico, whose government expressed the country's anti-axis feelings by resuming diplomatic relations with Great Britain (severed in 1938), and in numerous acts of co-operation with the United States. Brazil and Peru, traditionally pro-United States and pro-British, and unstable Bolivia and Ecuador were likewise generally friendly toward the United States and its

policies.

Japan's attack upon the United States, on Dec. 7, came as a shock to all Hispanic America. With striking unanimity and speed the Central American and West Indian republics forthwith declared war on the principal axis powers, in some instances preceding similar United States action. Mexico, Colombia and Venezuela severed relations entirely, others in part. Without exception, each of the nonwarring republics asserted the principle first enunciated by Uruguay upon United States entry into World War I in 1917, that any American nation at war with a non-American nation would be treated as a nonbelligerent, and therefore be accorded full use of ports and other facilities. This attitude was in striking contrast to that of 1917, when Mexico was openly pro-German and, in South America, only Brazil declared war, while five republics remained neutral. All the republics vigorously accelerated their defense preparations. Argentina and Chile undertook to modify their 1881 treaty demilitarizing the Strait of Magellan. Mexico, with consummate tact, requested United States permission to send Mexican troops through the United States to garrison her isolated territory of Lower California, then tendered full use of her own facilities to the United States whenever they might be needed.

Upon the initiative of Chile, in accord with machinery set up at the outbreak of World War II in Sept. 1939, a conference of foreign ministers of the American republics was called to meet at Rio de Janeiro Jan. 15, 1942. (*See* PAN AMERICAN UNION; WORLD WAR II and articles on individual countries.)

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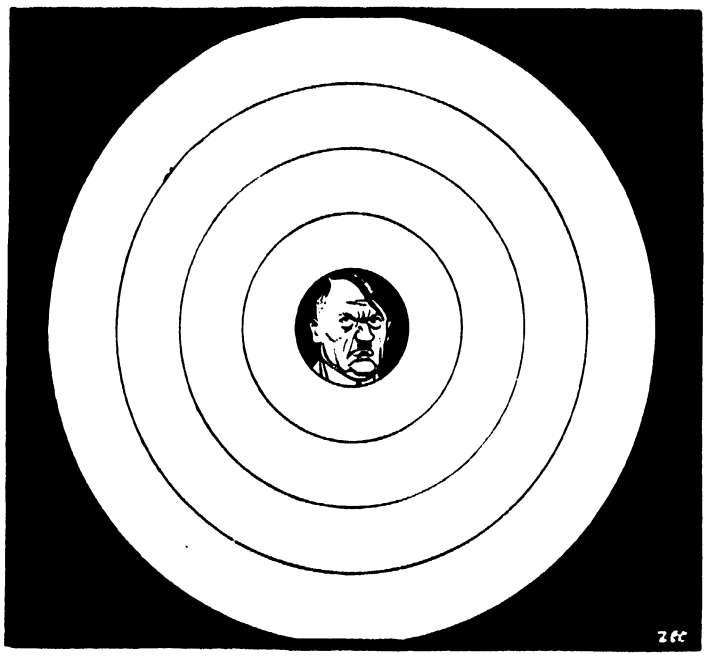
Hispaniola: *see* DOMINICAN REPUBLIC; HAITI; WEST INDIES.

Historical Association, American: *see* AMERICAN HISTORICAL ASSOCIATION.

Hitler, Adolf (1889–), German statesman, was born at Braunau on the Inn in Austria on April 20. For his early career, see *Encyclopædia Britannica*. In the so-called Munich Beer Hall Putsch of Nov. 9, 1923, Hitler attempted with Ludendorff, Goering (*q.v.*), Frick, Streicher, Roehm and others to seize the Bavarian government, but was arrested, tried for treason, and condemned to imprisonment at Landsberg. Here he dictated to his secretary, Rudolf Hess (*q.v.*), his famous book, *My Struggle* (*Mein Kampf*).



THE "WAR AIM" suggested by Cartoonist Zec of the *London Daily Mirror* in 1941 was eloquently simple

It is in part an autobiography and in part an exposition of his ideas for the regeneration of Germany, and is hence sometimes called the "Nazi Bible." On his release from prison in Dec. 1924, as a result of a general amnesty, he devoted himself to building up various organizations to strengthen the nazi party: Brown Shirts, Elite Guard (*Schutz-Staffeln* or "SS"), Hitler Youth (*Hitler Jugend*) and other formations. With the aid of these, with efficient lieutenants, and with his magnetic oratory, his nazi party grew rapidly in power, winning 12 reichstag seats in 1928 and 230 in July 1932. On Jan. 30, 1933, Hitler was appointed Reich chancellor and began the social and political revolution establishing the "Third Reich." Upon Hindenburg's death Aug. 1, 1934, Hitler succeeded him as president but became known as Reich Leader (*Fuehrer*) and chancellor. He became absolute master of the Reich and succeeded in rebuilding Germany's military might within five years. In 1938 he annexed Austria and, by the pact of Munich, dismembered Czechoslovakia. His last "white conquest" was the absorption of Czechoslovakia and Memel in March 1939; war resulted from his demands on Poland. For events in his career in 1941, *see* GERMANY. (S. B. F.)

Hobart, Esther Jane Tuttle (1849–1941), the wife of Garret A. Hobart, 24th vice-president of the United States, was born April 30, in Paterson, N.J. She assumed the duties of "first lady" in the administration of President William McKinley during Mrs. McKinley's illness. Mrs. Hobart died Jan. 8 at Haledon, N.J.

Hobson, Robert Lockhart (1872–1941), British authority on Chinese pottery and porcelain, was born July 26. The son of a clergyman, he was educated at St. John's Leatherhead, and Jesus college, Cambridge. In 1897 he became an assistant at the British museum, and deputy keeper of the department of British and mediaeval antiquities in 1921. He also had served as keeper of the department of oriental antiquities and of ethnography until his retirement in 1938. Among his publications are *Catalogue of English Pottery* (1903); *Guide to English Pottery and Porcelain* (1904); *Catalogue of English Porcelain in the British Museum* (1905); *Worcester Porcelain* (1910); *Chinese Pottery and Porcelain* (1915); *The Wares of the Ming Dynasty* (1923); *The Later Ceramic Wares of China* (1925); and *Catalogue of the Eumorfopoulos Collection* (1925–28). He died at his home in Horsham, Sussex, June 6.

Hockey: *see* ICE HOCKEY.

Hogs. Curtailment of United States supplies of fats and oils from Pacific areas in Dec. 1941, following the outbreak of war with Japan, led to an augmented program for increased production of swine in the United States in 1942. This program called for slaughter of 83,000,000 hogs, a record number, as compared with a total slaughter of 72,500,000 head in 1941. Of the total slaughter for 1942, it was expected that that of federal-inspected packing plants would be 54,000,000 head, compared with 46,519,757 head in 1941 and 50,397,860 in 1940. The fall pig crop in 1941 in the United States was 35,600,000, which was also a new record, 18% more than the 1940 fall crop. The spring, 1942, pig crop, the department of agriculture estimated, would set still another record, 62,000,000 head, 28% more than the 1941 spring crop. The previous largest spring pig crop was 54,500,000, in 1927. Pork products constitute a large part of the food supply sent to Great Britain by the United States and Canada.

Canada restricted its own consumption and banned exports of pork and lard to the United States in 1941 in order to maintain its shipments to Britain.

(*See* BACON; MEAT; *see* also FARM INCOME for United States lend-lease shipments to Great Britain.)

Reports from Denmark, the principal competitor of the United States in the British market for pork products previous to World War II, indicated a sharp decline in the number of hogs in that country after overseas imports of feeds had been cut off. On Oct. 4, 1941, hogs numbered 2,013,000 in Denmark, or 37% less than at the beginning of the war, the office of foreign agricultural relations, U.S. department of agriculture, reported.

From the same source on Dec. 15, 1941, came reports from Hungary that apparently indicated severe curtailment of pork and lard in Europe. Feed was so scarce that the number of hogs in Hungary fat enough to be slaughtered as required by government permit was 30% under the number in 1938. Slaughter of lean hogs (under 220 lb.) was not permitted, and, although there was a shortage of pork and lard, farmers were burdened with hogs they could neither fatten nor sell.

The entire hog industry of Europe in 1941 was under military control, and rationing of pork and pork products to the civilian population was general. While it was impossible in 1941 to obtain specific figures, it was known that the scarcity of feed compelled the liquidation of hogs in 1940 and early in 1941. It was believed that the number had been reduced in most countries to a point where they could be maintained on the reduced feed supplies.

In axis-dominated countries, requisitions of pork products were made for the army of occupation and sometimes for export to Germany.

Argentina contracted to supply Great Britain with 88,000,000 lb. of frozen boneless pork during the year ending Sept. 30, 1942, the largest export demand Argentina had ever experienced. Coupled with an extremely low price for corn, this export demand caused a large increase in swine production in Argentina.

(S. O. R.)

HOLC: *see* HOME OWNERS' LOAN CORPORATION.

Holland, Charles Thurstan (? –1941), British scientist and radiologist, was one of the first scientists to experiment with the X-ray after its discovery was made known by Roentgen and was quick to recognize its importance in medical diagnosis and surgical treatment. During World War I he was a member of the war office committee on radiology. He was credited with perfecting a method used during the war for locating bullets embedded in wounded men. He was lecturer at Liverpool university from 1920 until his retirement in 1931. Dr. Holland also was a fellow of the Royal College of Surgeons, twice president of the Roentgen society, fellow of the Royal Photographic society and fellow of the American College of Radiology. He died Jan. 16 in London.

Holland: *see* NETHERLANDS.

Holt, Sir Herbert Samuel (1856–1941), Canadian financier. Once a day labourer, he became one of the richest men in Canada. At one time he and his associates controlled a vast network of 250 companies whose total assets were more than $2,500,000,000. Born Feb. 12 in County Kildare, Ireland, he emigrated to Canada in his youth and worked as a railroad labourer. An able executive, he soon became superintendent of construction. He then went into business for himself and became a contractor and railroad builder. By 1901 he had won control of a rich Montreal utility and in 1908 he became president of the Royal Bank of Canada. Another of his successful enterprises was the Canada Power and Paper company, which became a $100,000,000 corporation. Sir Herbert, who was knighted by King George V in 1915, died in Montreal, Sept. 28.

Home Building, Federal: *see* FEDERAL HOME LOAN BANK SYSTEM; HOUSING.

Home Owners' Loan Corporation. HOLC was created by congress in 1933 to make loans directly to distressed urban home owners over a three-year period by taking over their delinquent mortgages. Since its lending operations ceased in 1936, the corporation has been engaged exclusively in the collection of the funds it loaned and in the sale and rental of the properties it has been forced to acquire.

Loans were made at an interest rate of 5%, later reduced to 4½%, and were to run for a period not over 15 years, and to be retired through monthly payments covering principal and interest. The act was amended to permit the corporation to extend its loans to a maximum of 25 years, where the borrower's circumstances and the condition of the security justify such extension.

Provided with $200,000,000 initial capital, HOLC was authorized to issue U.S. guaranteed bonds in an amount not to exceed $4,750,000,000, of which $3,489,453,550 were issued. A total of $2,419,608,800 in bonds was outstanding as of June 30, 1941. The corporation lent more than $3,093,000,000 to about 1,018,000 home owners located in almost all the counties in the United States. Its average loan was slightly more than $3,000.

As of June 30, 1941, only 6·5% of HOLC's 842,288 active accounts were in default. That is, 93·5% of the corporation's total active loans and sales contracts were being repaid in satisfactory fashion. While the remaining borrowers or purchasers were in varying delinquency, only a small percentage were in imminent danger of foreclosure. More than 108,000 loans amounting to $260,000,000 were paid off in full and the mortgages cancelled. From the beginning of its operations through June 30, 1941, HOLC acquired about 182,000 properties. This is 17·9% of the total number of loans granted. On that date the corporation had sold more than 139,000 of its acquired properties. Of the unsold properties available for rental income, about 91% were rented.

The progress of HOLC toward liquidation of its loans and properties is shown by the fact that principal payments on its mortgages and sales contracts on June 30, 1941, reached 33·5% of its original loans plus later advances and refunded interest on extended accounts. (*See* also FEDERAL HOUSING ADMINISTRATION.)

(J. H. FA.)

Honduras. A Central American republic lying mainly on the Caribbean slope. Area, 46,332 sq.mi.; pop. 1,038,061 (1940 official est.); capital, Tegucigalpa (35,000, including adjacent areas); language: Spanish; religion, Roman Catholic; president: General Dr. Tiburcio Carías Andino.

History.—Politically, Honduras was quiet throughout 1941 despite rumours of revolutionary plotting which circulated from time to time. Economically, the country continued in a depressed condition. Pres. Carías' government maintained a close co-operation with the United States. In line with this policy, the government, by decree of June 10, put under strict control a variety of strategic materials to non-American countries. Earlier, the German chargé d'affaires was expelled for propaganda and other activities, and by September all relations with Germany and Italy had been severed. On Dec. 8, congress unanimously voted to declare war on Japan, following this action with declara-

tions against Germany and Italy (Dec. 12).

Education.—There were approximately 1,000 elementary schools in 1941, with an enrolment of 35,000, 93 secondary and two normal schools (3,000 enrolment), and one university. Illiteracy is high. Approximately 10% of all government expenditure was for education in 1941.

Defense.—A standing army of 3,000 was supplemented by extensive reserves in 1941. The small air force (18 planes) is used especially in maintenance of internal order. Honduras had two coastguard cutters in 1941.

Finance.—The monetary unit, the lempira, is valued at 49 cents U.S. The 1941–42 budget presumed balance at 11,446,000 lempiras. The national debt as of June 30, 1940, was $8,715,371 (internal: $6,153,434).

Trade and Resources.—Imports ir the fiscal year 1939–40 were valued at $10,085,069, the United States supplying 62.7% (1938–39: 65.3%), Japan 13.2% (6.0%), Germany 6.5% (11.4%), Salvador 5.5% (4.9%), Curaçao 4.1% (3.9%), Great Britain 2.9% (3%). Exports valued at $9,657,294 were taken almost entirely by the United States (95.6%; 1938–39: 90.7%) and Salvador (2.7%). Bananas (12,677,737 stems) made up 65.5% of all exports valued, silver (4,090,223 oz.) 15%; gold (23,584 oz.) 8.9%. In 1940–41, imports were $10,085,070, exports $9,867,156. In addition to bananas, coffee (2% of exports), livestock, tobacco, coconuts and grapefruit are produced for export. During 1941 a U.S.-Honduran commission of agricultural specialists studied possibilities of developing vegetable fibres and medicinal plants.

Communication.—External communication is by steamship and by Pan American Airways, internal communication by airlines connecting the principal cities. In 1941 there were more than 500 mi. of main highway, and about 800 mi. of railway (besides 700 mi. on banana plantations).

(L. W. Be.)

Honduras, British: *see* BRITISH HONDURAS.

Honey: *see* BEE-KEEPING.

Hongkong. A British crown colony, Hongkong is an island off the southeast coast of China, opposite Kwangtung province, at the mouth of the Canton river. The area of the island, which is rocky and very irregular in shape, is a little over 32 sq.mi.; the area of the so-called New Territory on the mainland, which was administered as part of the crown colony, is 356 sq.mi., with Kowloon, immediately opposite Hongkong island, as the chief town. The non-Chinese civil population of Hongkong (1939) was 23,611; the Chinese population was 1,026,645. There were also some 750,000 Chinese refugees.

Hongkong was a great transshipment centre and in some years ranked as the fourth largest port in the world, as regards the number of ships which entered and cleared. Imports from the British empire in 1939 were £2,588,902, and exports were £5,192,066. Imports from other countries were £31,489,901, and exports were £26,211,193. The unit of currency was the Hongkong dollar, the value of which was about 25 cents. Revenue in 1939 was $41,478,052, expenditure was $37,949,116.

Japanese military operations against Hongkong began Dec. 8, immediately after the declarations of war against the United States and Great Britain. The outer lines on the mainland were forced within a few days, and the Japanese effected landings on the island. British, Canadian and Indian troops carried on a desperate last-stand defense on the rocky hills of the island; but the overwhelmingly superior forces of the invaders, air bombardment and a threatened failure of the water supply forced a capitulation on Dec. 25. General Renzo Isogai was appointed Japanese military governor of Hongkong. Details of the fighting were obscure, because of defective communication. Hongkong had long been regarded as an exposed outpost and had been more and more surrounded as the Japanese established themselves in Canton (in 1938), on Hainan island (1939) and in French Indo-China (1940). It had been counted on only for a delaying action; it probably fell more quickly because the sinking of the two British capital ships in far eastern waters, the "Prince of Wales" and the "Repulse," confirmed Japanese mastery of the sea, and the Japanese also possessed definite air superiority. U.S. pilots took out of Hongkong a number of individuals, including Mme. Sun Yat-sen, who were especially anxious to avoid capture by the Japanese; but a considerable number of British and some U.S. civilians were made prisoners, along with the surviving forces of the garrison. (*See* also JAPAN: *History.*) (W. H. Ch.)

Hopkins, Harry L. (1890–), U.S. politician, was born Aug. 17 in Sioux City, Ia. After graduating from Grinnell college in 1912, he went to New York city to engage in social service work. He later became a fast friend of Franklin Delano Roosevelt, then governor of New York, who in 1931 appointed him director of the New York State Temporary Emergency administration. In 1933, Roosevelt named him federal administrator of emergency relief, and from 1935 to 1938 he was administrator of the Works Progress administration. In the latter position, he expended billions to provide work relief instead of monetary relief for unemployed millions. Hopkins was appointed secretary of commerce, 1938, but resigned in Aug. 1940 because of ill health. In Jan. 1941, he was sent to London as President Roosevelt's personal emissary to study the war situation at first-hand and to act as the president's "eyes and ears" in Britain. On March 27, 1941, the president named him lend-lease co-ordinator. Enjoying a unique position as one of the president's most trusted friends and advisers, Hopkins flew to London on a second mission in July 1941, thence going to Moscow to confer with soviet Premier Josef Stalin. The next month he retired as lend-lease administrator and was succeeded by Edward R. Stettinius, Jr. (*q.v.*).

Hops. United States production of hops (in three states only, Washington, Oregon and California) was estimated by the department of agriculture as 40,380,000 lb. from the 34,800 ac. harvested in 1941. The 1940 crop was 42,066,000 lb. from 32,800 ac. The ten-year (1930–39) average was 34,784,000 lb. from 29,660 ac. The yield was 1,160 lb. per acre in 1941, compared with 1,282 lb. in 1940 and a ten-year average yield of 1,171 lb. per acre. About 400 ac. in Oregon were not harvested because of wind and rain damage. The quality of the crop was good, but the "dry-away" was reported greater than usual. Of the 1940 crop, 5,068,000 lb. were not marketed in accordance with marketing agreement allotments.

U. S. Production of Hops by States, 1941 and 1940

State	1941 lb.	1940 lb.
Oregon	10,800,000	20,286,000
Washington	13,320,000	11,700,000
California	10,260,000	10,080,000

The yield by states in 1941 was 1,850 lb. per acre in Washington, 1,350 lb. per acre in California and 840 lb. per acre in Oregon.

(S. O. R.)

Horgan, Stephen Henry (1854–1941), U.S. inventor of the half-tone engraving process used in the production of newspaper and magazine pictures, was born Feb. 2 near Norfolk, Va. He studied photography in Nyack, N.Y., and in 1874 went to New York city, where he joined the *New York Daily Graphic* as a photographer. While on the *Graphic* he developed the first half tone used in a newspaper, a reproduction of a picture entitled "Shantytown," which appeared in the March 4, 1880 issue. In 1893 he became art director of the *New York Herald.* Balked there in his efforts to apply the half-tone technique to the high-speed presses, he went to the *New York Tribune,* where in 1897 he made the first half tone printed on a web-perfecting newspaper press using stereotypes. On his suggestion the American Telephone and Telegraph company in 1924 sent the first coloured picture over wires. His publications include *Horgan's Half-Tone and Photomechanical Processes* (1913) and *Photoengraving Primer* (1920), which appeared in a 2nd edition as *Photoengraving in Black and Color* (1938). Horgan died in Orange, N.J., Aug. 30.

Hormones: *see* BIOCHEMISTRY; ENDOCRINOLOGY.

Horse Racing. In extent and volume, in almost every attendant feature, all previous figures in the United States were surpassed in 1941. When, in 1940, the total amount of money distributed at recognized meetings fell just short of $16,000,000 ($15,911,167), it marked a gain of over $500,000 from 1939. But 1941 saw the total rise to almost $18,000,000 ($17,987,935). To appreciate the meaning of such figures it needs but to be recalled that at the height of the "boom days," just previous to the economic debacle of 1929, the premier year had been 1927, with a total of $13,935,610. The total number of races run rose from 16,401 to 16,912, a gain of more than 500. The number of distinct and separate days of racing given at the various meetings rose from 2,096 to 2,162. While precise figures for the U.S. are unobtainable, those for the New York season may be cited as an indication. During 175 days of racing given in that state there was a total attendance of 2,503,864, a gain of almost 500,000 from 1940, when the figures were 2,041,374. The daily increase was therefore nearly 3,000. The revenue from taxation in 1941 to the state rose from $5,572,990 to $7,168,408. More than $500,000 more was distributed in stake and purse money than in the previous year, the total reaching $2,198,554. In Illinois there was a general increase, in all departments, of about 20%. In California—next to New York, the most important racing state—the distribution rose from $2,378,752 to $2,689,674. The crowds which attended upon the "big" days, were, collectively speaking, the largest ever known, often ranging above 40,000 and 50,000. The Kentucky Derby, the Santa Anita handicap, the Belmont stakes, the Classic, the Preakness, the Suburban, the various great futurities, called out throngs which taxed the confines of the parks.

The "horse of the year" was adjudged to be the three-year-old chestnut colt Whirlaway, bred and owned by Warren Wright, of Calumet Farm, Lexington, Ky. He won 13 of 20 races, including the U.S. "triple crown" of Kentucky Derby, Preakness and Belmont, and the sum of $272,386. Next to him in prominence came the two-year-old bay colt Alsab, owned by Mrs. Albert Sabath, of Chicago, Ill. He won 15 of 22 races and $110,600, though ineligible for many of the richest stakes for his age. Through his last ten starts he was undefeated, and his feat of running a mile in 1:35⅘ when winning the Champagne stakes was regarded as one of the greatest in turf history. The leading older horse was the bay five-year-old Big Pebble, owned by Wm. E. Moore, of the Circle M Ranche, Sheridan, Wyo. He won 5 of 16 races, not a large percentage, but three of them were the $75,000 Hollywood Gold Cup, the $50,000 Widener handicap and the $25,000 Washington Park handicap.

The richest single event of the year was the Santa Anita handicap, worth $89,360 to the winner, the bay four-year-old Bay View, owned by Mrs. Anthony Pelleteri, of New Orleans, La. From the standpoint of winnings, however, the feature of the year was the success of Mr. Wright's Calumet Farm Stable, which won 70 races and the sum of $475,091, a new record of its kind in America and the world.

It was trained and managed by Ben A. Jones.

One of the most important developments of the season was the widespread revival of long-distance racing and the establishment of new records over such routes. Louis Tufano's three-year-old bay colt Market Wise lowered the mark for 2 mi. from 3:21⅘ to 3:20⅘; William Woodward's bay four-year-old Fenelon that for 2¼ mi. from 3:48⅘ to 3:47; and B. W. Hulsman's five-year-old Farragut that for 3 mi. from 5:19 to 5:15.

Harness Turf.—The most memorable event was the lowering of the world's record for trotting stallions, which had stood at 1:58¼ for 25 years previously, to 1:57¼ by the brown four-year-old colt Spencer Scott, owned by C. W. Phellis, of Greenwich, Conn., and bred by David M. Look, at Castleton, near Lexington, Ky. The premier winner of the year was the three-year-old brown colt Bill Gallon (1:59½), he taking the Hambletonian stake, the Kentucky futurity, etc., with earnings of approximately $40,000. He was owned by R. H. Johnston, Charlotte, N.C., and was bred at the Hanover Shoe Farms, Hanover, Pa. (J. L. HE.)

Great Britain.—Horse racing during 1941 was restricted to one quarter, approximately, of a normal season. It followed automatically, therefore, that the number of horses in training also showed a decrease. The effect on breeding, however, was not so serious as might appear, as the weeding-out process was confined largely to geldings.

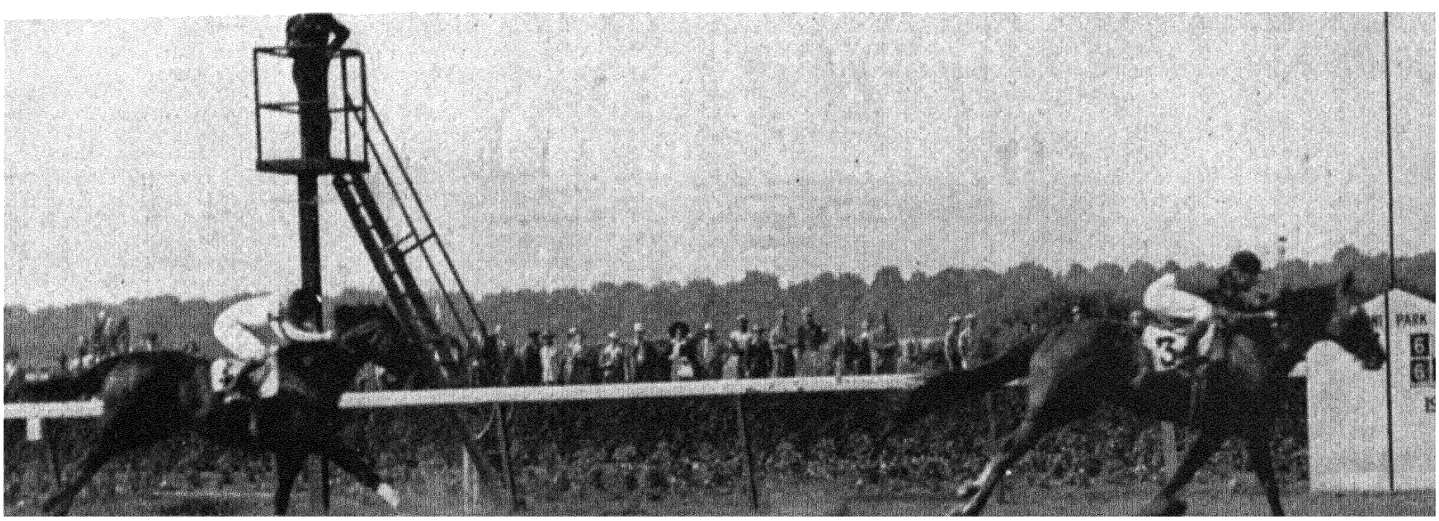
The king had the best season he had experienced so far, winning 11 races. His two-year-olds, Sun Chariot and Big Game, who won nine races between them, were leased from the National Stud. The king finished third in the list of winning owners, Lord Glanely, whose filly, Dancing Time, was successful in the One Thousand Guineas, coming first, and Mrs. Macdonald-Buchanan, who won the Derby with Owen Tudor, being second.

Owen Tudor was trained at Beckhampton by F. Darling, who also turned out Commotion to win the Oaks. Also in Darling's charge were Sun Chariot and Big Game, and the stable altogether won more than £19,000 in stakes. J. Lawson, the Manton trainer, and Capt. O. Bell, whose stables are at Lambourn, were second and third respectively in the list of winning trainers.

In the absence of G. Richards, who had a leg broken as the result of an accident at Salisbury in May, the jockeys' championship went to H. Wragg, who rode 71 winners—ten more than E. Smith.

Leading sire of the season was Lord Derby's good horse Hy-

WHIRLAWAY, outstanding horse of 1941, won the Belmont Stakes June 7 by a safe margin



perion, whose progeny won 35 races to the value of more than £22,500. Hyperion is the sire of Owen Tudor as well as of the St. Leger winner, Lord Portal's Sun Castle. Colombo, owned by Lord Glanely, who headed the list of winning breeders, was the second most successful sire of 1941. (A. K. B.)

Horses. The return of horses and mules, to take over a part of the work of urban motor deliveries and rural transportation, was forecast in 1941 following the diversion of the automobile industry to the fabrication of planes, tanks, guns and other war munitions, the cessation of the manufacture of automobiles for private use, and the drastic restrictions on tires, to conserve rubber for war uses. For more than 20 years the number of horses and mules in the United States had steadily declined. Horses had almost disappeared from city streets. On 6,096,799 United States farms in 1940, 1,567,405 tractors did the work formerly performed by draft animals. Horses and colts on the farms had declined to 10,086,971; the number of mules and mule colts, to 3,844,560.

The foregoing figures are from the United States census as of April 1, 1940. In 1941 there were approximately 14,000,000 horses and mules in the United States, as estimated by Wayne Dinsmore, secretary of the Horse and Mule Association of America and a foremost authority on the subject.

Of this number, Dinsmore reported, about 12,000,000 could be put to work in harness or under saddle in the spring of 1942. The remaining 2,000,000 consisted of animals under working age, race horses, horses in riding stables, stallions, jacks and jennets.

Although there was active inquiry by business firms as to the availability of horse power as a substitute for motor power in urban deliveries, there was little increase in the buying of draft animals.

Farmers who do not raise their own replacements do not generally buy horses and mules until March. There was still a number of months' wear in the tires on trucks in use at the end of 1941, and any substitution of horses for motor trucks required the use of horse-drawn types of vehicles which for many years had been manufactured only in very small numbers.

Light trucks suitable for urban, milk, laundry and such deliveries can be converted into horse-drawn vehicles, Dinsmore pointed out, by the addition of a pair of shafts.

Tires, too badly worn to stand up under motor-truck speeds, would, he said, give two or three more years of service under horse-power speed, as had been proved by tests at the South Dakota experiment station.

The 12,000,000 work animals, Dinsmore added, could by efficient management be made to do the work normally performed by 18,000,000 in peacetime. Prices for draft animals at the beginning of 1942, ranged from $65 to $300 a head. Good farm chunks, the type most in demand, were $125 to $150 a head.

In a talk at a meeting of horse and mule growers Dec. 3, 1941, Gen. John K. Herr, chief of cavalry, U.S. army, was reported to have said the most reliable information available to the army gave the number of horses in use in the Russian, German, Japanese and United States armies as shown in the table on this page.

	Cavalry	Draft and pack
Russian army	100,000	800,000
German army	50,000	910,000
Japanese army	50,000	325,000
United States army*	25,000	12,000

*U.S. Army had 13,000 additional horses in remount depots and administrative service.

The report of Gen. Herr's talk said further that the German army had 25 mechanized, 35 motorized and 245 marching divisions, with 4,000 horses to each infantry or marching division, or one horse to each four infantrymen, truck fleets being used to bring supplies from bases and horses being used for marching transportation. Replacements or increases of draft animals is a slow process, as three years are required from the time of breeding until a colt can be worked even as a two-year-old. (*See* also SHOWS.)

Since steel and iron are a first necessity of war and their use is closely restricted by the government it is interesting to note the quantity of metal required in a year for horses and mules in the United States. The amount is estimated at about 30,000 tons annually, for the manufacture of horseshoes and horseshoe nails. This for 12,000,000 work animals. The manufacture of 20,000 tractors would require about the same amount. (S. O. R.)

Horse Shows: *see* SHOWS.

Horticulture. The wine industry in France was entirely disrupted, and all horticultural conditions in Russia were violently dislocated because of the war. The bulb fields in the Netherlands in 1941 were intact. Germany and the Scandinavian countries were purchasing a considerable number of bulbs, but nevertheless a large surplus remained.

Horticulture in Great Britain was not broken down by any means, and many of its flower shows were in 1941 being continued. British garden magazines continued to be issued although greatly reduced in size. Commercial horticulture was carried on. A particular effort was made in Britain in 1941 to foster the sale of tulip bulbs to the United States and Canada. Growers as well as dealers were forbidden to sell tulips in Great Britain, either as bulbs or blooms, except outdoor flowers. It is estimated that more than 30,000,000 tulip bulbs were sent to the American continent in the autumn of 1941, which number, combined with the output of Canadian and American growers, about doubled the 1940 supply. Normal imports are about 125,000,000 bulbs. Moreover, the English bulbs, because of an intense heat wave and drought, were smaller than anticipated.

The economic embargo practically shut off all imports of lilies from Japan, although a few arrived in the United States before shipping ceased. Under normal conditions 20,000,000 lily bulbs are available in the U.S. each year, but in 1941 the total supply was hardly more than 600,000 bulbs. The Pacific coast produced about 250,000 lily bulbs, and approximately 150,000 came from Bermuda. Louisiana's crop of lily bulbs was reported short. All this indicated a noticeable lack of lilies at Easter in 1942, with the result that other flowers, especially azaleas and astilbes, would be offered as substitutes.

Reduced bulb importation meant that a new and lucrative business was being developed in the United States at the expense of other countries. The greatest number of American bulbs comes from the Pacific coast, but there is acreage of considerable size in Michigan, New York, Virginia and other states. The largest plantings in the northwest are in Oregon and Washington.

Large quantities of irises are grown in the southern part of Oregon. Regal lily production in the United States centred around Portland, Ore., and Puget sound. As a matter of fact, the United States was in 1941 independent of Japan so far as these lilies were concerned, and it appeared that the United States would gradually be successful in the growing of so-called Easter lilies. From 80% to 90% of the daffodil, iris, tulip and lily bulbs go to the florist.

South America has been largely responsible for the rapid development of the orchid industry, both in America and Europe, but hybridization became such a factor that the importation of wild plants seemed no longer very important. However, South America was expected to be the greatest source of rotenone, a

material which has become almost indispensable in the manufacture of various insecticides. Rotenone comes from several different South American plants and was in 1941 largely substituted for more poisonous materials like arsenate of lead. It is fatal to cold-blooded animals, and in South America it is used as a fish poison. Formerly most of the rotenone used came from the East Indies. South America and Mexico have great possibilities as a source of silk. Mulberry trees grow well there, and in some sections much attention was given in 1941 to the development of the silk industry.

In the United States unusual attention was given to herbs, because importations from foreign countries almost stopped. Digitalis and many other herbs were in short supply, but only herbs of high quality were desired, and no one could afford to undertake herb growing without being well acquainted with the methods required, in addition to having adequate knowledge as to markets.

California suffered from early and copious rains, which came unexpectedly in October. These rains slowed up the harvesting of seeds for at least two weeks, and this fact resulted in short crops. This applied to both vegetable and flower seeds, and it seemed likely that seeds of beets, carrots, onions, peas and parsnips would be somewhat scarce. Later reports revealed shortages in lettuce and radishes. It seemed probable that Drummond's phlox would be very scarce, and the seed crops of some grasses in California were smaller than for many years. The alfalfa seed crop in Arizona and California was smaller than half the amount produced in 1940, with a demand which was double that of that year.

It was indicated in 1941 that farmers and market gardeners would go along with the department of agriculture in Washington in its desire to increase the yield of farm crops, vegetables and small fruits in order that heavy shipment might be made to Great Britain and elsewhere. Farmers were asked to increase their vegetable garden crops for consumption in the home by 50%.

City residents were urged not to make vegetable gardens unless they knew just what they were doing, as the waste of seeds, fertilizers and spray materials might exceed the value of the crops grown. However, home garden makers in cities as well as in the suburbs were advised to continue the planting of flowers and shrubs. (*See* also BOTANY.) (E. I. F.)

Hospitals. The outstanding development in the hospital field for 1941 from the viewpoint of future potentialities would seem to be the closer association among the Americas. Since 1939, many representatives of Latin-American governments and of voluntary hospitals have attended administrative institutes in the United States and in Puerto Rico and have extensively visited hospitals in the United States and Canada. This *rapprochement* was crystallized in Sept. 1941 when, at the Atlantic City American Hospital association meeting, an Inter-American Hospital association, under the leadership of Dr. Malcolm T. MacEachern, was formed.

Another development of international interest was the meeting in London on Nov. 25, 1941, at the call of W. McAdam Eccles, London, of representatives of a large number of nations to consider replacing the International Hospital association by a new international body to function during the war and in the years to follow.

Sir Bernard Docker, chairman of the British Hospitals association, stated in the *Hospitals Year-Book, 1941,* "The future of voluntary hospitals is bound up inevitably with the future planning of the health services of the country." He outlined three fundamental principles for their continuance: (a) elasticity and freedom in their work; (b) payment by the state and municipalities for services rendered for them; (c) co-operation between the voluntary hospitals and the rate-aided or state-aided institutions.

The British ministry of health proposed to develop regionalization of hospital services on a broader scale than previously planned. Highly specialized services were to be provided at strategic centres and financial assistance would be forthcoming when necessary, though patients would be expected to pay when possible. A governmental committee under Lord Rushcliffe was to draw up a scale of salaries and emoluments for state registered nurses and for student nurses. To aid voluntary hospitals unable to meet the higher salaries for the civil nursing reserve decreed in April 1941, the government would advance certain financial assistance.

Hospitals in Canada, Australia, New Zealand and India and in more or less neutral countries were contending with defense preparations, with increased difficulties in obtaining equipment and supplies, and with augmented financial and personnel problems. In the United States the establishment of "priorities" did much to direct purchasing into controlled channels. The United States public health service was authorized to provide funds to assist three developments in nursing education: (1) to increase the number of students; (2) to prepare inactive graduate nurses for active duty; and (3) to aid postgraduate instruction in special fields.

Hospital service plans continued to make phenomenal growth in North America. A milestone was passed in September when the future co-ordination of these plans and the hospitals was assured by the inclusion of recognized plans as members of the American Hospital association and the setting up within the association of a Hospital Service Plan commission named by the plans themselves. An Institute for Hospital Service Plan Executives was held in Philadelphia in July. Other special institutes held for the first time were one on purchasing, held at Baltimore, and one on accounting, held at Indiana university.

Construction.—One of the finest new hospitals to be opened was the 600-bed children's hospital in Mexico City. Many military hospitals were built in the belligerent countries in 1941.

(G. H. AG.)

Houghton, Alanson Bigelow (1863–1941), U.S. diplomat, was born Oct. 10 at Cambridge, Mass. He served as U.S. ambassador to Germany and Great Britain during the years following World War I. Houghton died in South Dartmouth, Mass., Sept. 16. (See *Encyclopædia Britannica.*)

Housing. The number of local housing authorities co-operating with the United States Housing authority under the Wagner-Steagall Housing act of 1937 grew to over 640. Many projects passed from plans to construction to occupancy.

Table I.—*USHA—Local Authorities Program*

	Dec. 15, 1941	Dec. 19, 1940
Total number of projects	730	489
Total number of localities	541	221
Total number of dwelling units	182,649	158,234
Number units completed	103,602	35,130
Number under construction, not completed	40,905	80,422
Average over-all cost per dwelling unit including land and utilities	$4,213	$4,308
Average net construction cost per dwelling unit	2,695	2,717
North: Average monthly shelter rent per dwelling unit	15.40	14.77
South: Average monthly shelter rent per dwelling unit	11.32	10.06
Average family income in north	999	910
Average family income in south	767	651

As more than two-thirds of the 1937–38 slum clearance and public housing program had, by 1941, passed from the construction to the tenancy stage, it was possible to observe its tonic effect on neglected real estate and its far more important service to public health and citizenship.

Farm Security Administration.—The Farm Security administration of the department of agriculture did much for better housing on the farm. It works under four heads, to which has been added defense housing.

1. *The Tenant Purchase program,* under the Bankhead-Jones act of 1937, sanctioned 9,380 tenant-purchase loans during the first eleven months of 1941, totalling $52,500,000. The history of these loans shows that in nearly half the cases new farm homes are built. In the remainder old houses are modernized.

2. *Homestead developments,* 175 in number, form planned agricultural communities. At the end of 1941, 13,358 families had settled in them.

3. *The Rehabilitation program* was extended during 1941 to about 40,000 low-income farmers with loans totalling $96,000,000. Parts of these loans are used to provide sanitary privies, window screens and protected wells.

4. *Migratory Labour Camps.*—As of Nov. 30, 1941, FSA had 101 camps with accommodations for 20,607 families, either completed or under construction, in eastern as well as western states.

Defense Housing.—At the end of 1940, the official estimate was that 200,000 new family dwelling units were needed for workers transplanted for the national defense program. Enlargement of the defense program lifted the estimate to 600,000 by early summer. The enormous increase in war production planned during Dec. 1941 was expected to further increase the need for defense housing, but how much, few would venture to estimate.

Figures supplied by the Division of Defense Housing Co-ordination, OEM, make possible the summary in Table II.

Table II.—*Defense Housing by Public Agencies (Dec. 27, 1941)*

Total family dwelling units allocated	129,154	
Total family dwelling units completed		63,684
Total family dwelling units under construction		43,128
Total waiting for congressional appropriation		18,912
Total units for single persons allocated	11,051	
Total units for single persons completed		6,894

In addition to what is noted above, some 8,745 trailers and temporary prefabricated family units, as well as some temporary dormitories, were allotted to the FSA to handle as "stop-gap" housing until something else was available. It is also one of the public agencies building permanent housing, although not on a large scale.

The USHA slum clearance projects which had been converted to defense housing use numbered 129 in 1941 and contained 35,917 family dwelling units.

It should be reasonably clear that 1942 began with congress more than a year in arrears in supplying the funds for defense housing by public agencies. And also that public agencies are the only ones able to swing into mass production to produce adequate housing promptly. Further, the risk of financial loss inseparable from building for temporary use of uncertain duration will never be assumed by private business enterprise, nor by anything except the federal government, which must consider it part of the cost of the war.

The legislative and administrative history of 1941 in connection with defense housing is exceedingly complicated. In simplest terms, the defense housing co-ordinator determines the amount of new housing needed in the various defense areas and how much of it should be done by public agencies. Having obtained the president's approval, the list goes to the Federal Works agency (*q.v.*), whose administrator assigns it to one of several agencies. What congress has done and has not done is a story in itself. As the author of a magazine article put it, "Housing cannot win the war, but it can lose it." (*See* also BUILDING AND BUILDING INDUSTRY; BUSINESS REVIEW: *Industrial Groups;* CENSUS, 1940: *Housing Data;* FEDERAL HOUSING ADMINISTRATION; FEDERAL WORKS AGENCY; MUNICIPAL GOVERNMENT; WASHINGTON, D.C.

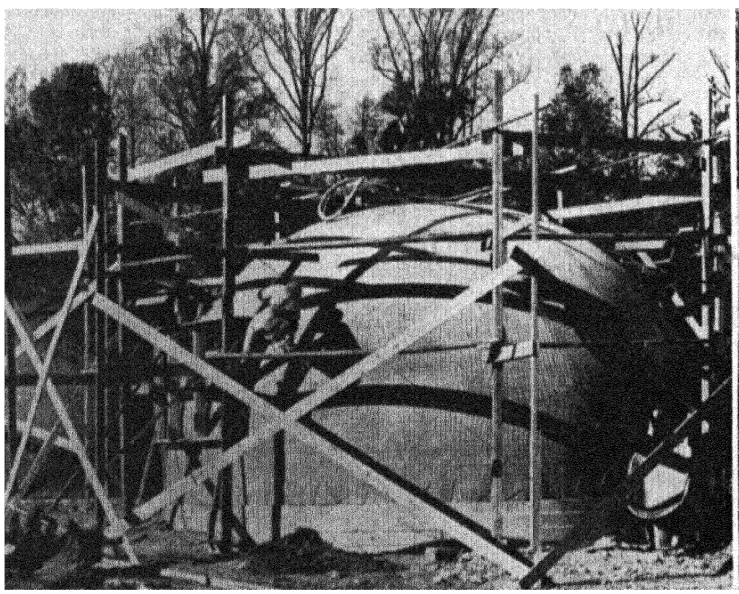
BIBLIOGRAPHY.—Mabel L. Walker and others, *Urban Blight and Slums* (1938); *U.S. Census of Housing* (1940); National Association of Housing Officials, *Housing Yearbook* (1941); Publications of the United States Housing authority, The Farm Security administration and the Division of Defense Housing Co-ordination. (E. E. Wo.)

Great Britain.—The only housing which was carried out during 1941 was to provide essential accommodation for workers in the newly built factories all over the country. Limitation of supplies of materials, of course, restricted not only the output in housing but also the type of design adopted.

A good deal was done by way of building hostels for workers with communal accommodation for feeding and recreation. Most of these buildings which were officially erected were from a standard design adapted to meet local requirements and materials available; timber was used, as well as bricks and precast concrete.

In order to simplify production the ministry of works and building set up a standardization committee which was gradually standardizing all kinds of units and articles of equipment for building. Bricks were reduced to two sizes; and of the numerous types of factory-made doors on the market only about six were permitted to be made. The same applied to locks, door furniture, windows and many other component parts of the house.

The effect of this standardization was expected not only to



Left: INFLATED BALLOONS, sprayed with sand and concrete, form the "framework" of new houses constructed in 1941 near Washington, D.C. to relieve the capital's housing shortage. After the concrete sets, the balloons are deflated and removed

Right: COMPLETED "balloon house" of four rooms, built at a cost of less than $3,000

A FINISHED HOUSE was built in 58 minutes at Grand Prairie, Tex. in 1941 by workers on a defense housing project

simplify and cheapen building for wartime purposes but also in the future. Regulations governing the output of various materials and articles concerned were likely to remain in force for a considerable time after the war in order to meet the program of building which would undoubtedly be embarked upon.

The destruction of houses by bombing and the closing down of all programs of building except those essential to wartime needs was bound to result in a great shortage of houses after the war. Another factor created an urgent demand for small houses whether they be state-built or otherwise; it would be possible under postwar economic conditions for only very few people to maintain large houses on the scale which was quite common before the war.

The Royal Institute of British Architects Re-construction committee issued a report on wartime and postwar housing generally. (See *R.I.B.A. Journal*, Sept. 1941.)

Many societies and associations were active in producing reports and initiating propaganda on the proper design of the small house. Although little housing work was actually being carried out during the war, there was every sign that the conditions brought about by the war were being utilized to improve and economize house building in the future. (F. R. Y.)

Housing Administration, Federal: *see* FEDERAL HOUSING ADMINISTRATION.

Housing Authority, U.S.: *see* FEDERAL WORKS AGENCY.

Hovey, Otis Ellis (1864–1941), U.S. civil engineer, was born April 9 in East Hardwick Vt. An authority on bridges and dams, Hovey supervised the building of emergency dams at the Panama canal and directed the building of the Bayonne bridge. He wrote many technical papers on engineering, and his two-volume work, *Movable Bridges* (1926–27), is a standard reference work on the subject. Hovey died in New York city April 15.

Howland Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Hoxie, Charles A. (1867–1941), U.S. inventor, was born in Constable, N.Y. He studied mechanical and electrical engineering and contributed to the development of telephony. In 1920 he developed an instrument which received transatlantic wireless messages 30 times faster than reception of messages handled by the most skilled operators. The General Electric company credited Hoxie with devising the first workable process for turning sound into light and recording it on transparent films.

His early experiments in this field led to creation of the Hoxie machine for recording sound on the same film that carried motion pictures.

Hoxie died in Alplaus, N.Y., on Oct. 13.

Hull, Cordell (1871–). U.S. statesman, was born Oct. 2 in Overton (now Pickett) county, Tenn. He was graduated from the Cumberland university law school in 1891 and served as a captain in the Spanish-American War. He served in congress from 1907 to 1931, except for one brief interval, 1921–23. He was elected to the senate in 1931 but resigned in 1933 to become President Roosevelt's secretary of state. Internationally, his name became closely associated with the "good neighbour" policy in South America and elsewhere; he was a consistent foe of aggression in settling disputes. He roundly denounced the Japanese attack on the Philippines and Pearl Harbor on Dec. 7, 1941, as a "treacherous and utterly unprovoked attack"; he further accused the Nipponese of having been "infamously false and fraudulent" by preparing the attack while their envoys were in the United States conducting purported peace negotiations. When Hans Thomsen, German chargé d'affaires, called on Hull Dec. 11, 1941, to inform him of Germany's declaration of war on the United States, he was kept waiting fifty minutes in an anteroom pending Hull's arrival. When the secretary finally arrived, he completely ignored Thomsen and strode into his office. He refused to see the German envoy, who was compelled to hand his war note to a state department aide.

Hungary. A kingdom in central Europe. Area (1940): 61,872 sq.mi.; pop.: 12,708,439. Capital: Budapest. Chief cities: Budapest (1,115,877); Szeged (131,893); Debrecen (122,517); Kolozsvár (100,844); Kecskemét (83,732). Religion: the majority are Roman Catholics, with strong Protestant and smaller Jewish and Greek minorities. King: throne vacant since 1918, royal functions exercised by regent Nicholas Horthy de Nagybanyá. Premier, László de Bárdossy.

History.—At the beginning of 1941, Hungary went through several changes of cabinet. On Jan. 27 the Hungarian foreign minister Count Stephen Csáky (*q.v.*), one of the staunch friends of the axis, died, and László de Bárdossy, minister to Rumania, was appointed in his stead. Opposition to the out-and-out pro-

axis course of the Hungarian government was in no way dead by that time. One of the outstanding Hungarian statesmen, Count Stephen Bethlen, who had been prime minister for many years, declared in a statement on Feb. 10 that "it is not logical to believe that the German form of dictatorship will be the final form of political life in other parts of Europe. Liberalism raised hundreds of millions of men to a higher standard of existence than ever before achieved, and progress of 100 years was greater than that of the previous 1,000 years." In spite of these sentiments the Hungarian government proceeded on its course of full-hearted adherence to the "new order." At the end of February the Yugoslav foreign minister arrived in Budapest to emphasize the lasting friendship between the two countries, expressed in their pact of nonaggression. But only a few weeks later Hungary was to become the starting point of the German armies in the invasion of Yugoslavia, and in spite of the pact of "everlasting friendship," concluded only a very few weeks before, Hungarian troops were to follow the German conquerors into Yugoslav territory to annex parts of the lands of the "friend." The premier of Hungary, Count Pál Teleki (*q.v.*), committed suicide on April 3, most people believed as a sign of protest against Hungary's complete vassalage to Germany and her entry into the war against Yugoslavia. His death was in vain. The foreign minister Bárdossy became prime minister, and on April 11, Hungarian troops invaded Yugoslavia in the wake of the German army to occupy the Voivodina, the rich and fertile plains of the Bacska between the Danube and the Tisza rivers with the important cities of Subotica, Sombor and Novi Sad. This military occupation was the beginning of a violent persecution of the Serb population of these territories; thousands of them were driven from their homes, and repeated resistance was quelled by indiscriminate mass executions. It was Hungary's intention to annex all the territories which had belonged to Hungary before 1918. An area of 8,000 sq.mi. with a population well over 1,000,000 was thus incorporated into Hungary. On April 24 Admiral Horthy met with Chancellor Hitler to discuss with him Hungary's role in the "new order." The integration of Hungary into this "new order" made rapid progress, expressing itself also in the continuous fascistization and anti-Semitism which became more pronounced under Bárdossy than it had even been previously. The out-and-out national socialist parties in Hungary did not, however, show sufficient strength to assume the government. They were weakened by internal splits. In addition to the Arrow Cross party, there existed a Hungarian national socialist party under Count Fidelius Palffy and the group led by the former prime minister, Bela Imredy. The large Slovakian minority in northwestern Hungary had formed its own party whose leader, Dvaresak, declared himself ready to cooperate with the Hungarians. The relations with Rumania remained unsatisfactory, because Hungary claimed the rest of Transylvania which had remained with Rumania by the second Vienna award of Aug. 30, 1940, while the Rumanians could never forget the forced cession of northern Transylvania to Hungary by the same award. It was frequently rumoured that the tension between Rumania and Hungary had grown so much that an armoured conflict between these two satellites of Germany was not regarded impossible.

With Germany's aggression against the soviet union, Hungary also declared itself in a state of war with the U.S.S.R., and Hungarian troops participated in the war. When Germany declared war on the United States Dec. 11, 1941, Hungary again followed Germany's example. One of the most prominent Hungarian leaders, Tibor von Eckhardt, who visited America during the year, founded in the fall of 1941 a Free Hungarian movement in the United States, declaring that the Hungarian people and its government were acting under German pressure, and calling on all Hungarians to fight for the independence of their nation. Eckhardt was joined by the former Hungarian minister to Washington, John Pelenyi, by Count Koloman Almassy and others. (*See* also WORLD WAR II.)

Education, Defense, Finance.—In the year 1938–39 Hungary had 8,103 elementary schools with 1,104,916 pupils, to which should be added the large number of continuation schools and special schools for industrial and commercial apprentices, and 263 secondary schools with 79,435 pupils. There are four universities, at Budapest, Kolozsvár, Pécs and Debrecen, and a number of specialized institutions of higher learning.

On Jan. 28, 1939, Hungary reintroduced compulsory military service for all men between 18 and 60. There were eight army corps in 1941, besides two motorized brigades and two cavalry brigades. The air force is very small, and there is no navy. Government expenditures on the armed forces in 1941 was estimated at 385,838,000 pengös.

The monetary unit is the pengö; its value equals 19.77 cents U.S. The revenues for 1941 were estimated at 2,036,000,000 pengös, the expenditure at 2,084,000,000 pengös. National debt on June 30, 1940, amounted to 2,514,000,000 pengös, bank notes in circulation to 1,357,000,000 pengös on Sept. 30, 1940; the metal reserve to 166,000,000 pengös.

Trade, Communication, Agriculture.—Exports in 1939 had a value of 605,000,000 pengös, imports of 488,000,000 pengös. In the first half of 1940 the following goods were principally imported: coal, machinery and apparatus, while the principal items for export were animals, wheat and poultry. About 60% of Hungary's trade was with Germany. In 1939 Hungary had 6,307 mi. of railroads, 3,625 mi. of state roads, 2,898 post offices, 6,902 mi. of telegraph lines and 20,976 mi. of telephone lines.

Hungary is predominantly an agricultural country, growing wheat, maize, sugar beets and grapes, and raising cattle, horses and pigs. Its main industries are agricultural industries, but there are also some iron and steel works. Hungary produces coal, lignite and bauxite. (*See* also RUMANIA.) (H. Ko.)

Huntziger, Charles Léon Clement (1880–1941), French general, was born June 25 in Brittany. A lieutenant colonel at the beginning of World War I, he was promoted to the rank of brigadier general and was stationed for a time in Syria. At the outbreak of war in 1939, he was in command of the 2nd army that faced the German onslaught at Sedan in May 1940. After the collapse of the French armies, Marshal Pétain assigned him to sign the armistices with Germany and Italy in June 1940. He was later made war minister and commander in chief of the French army. Gen. Huntziger was reported anti-British in his views, but it was said that he opposed the collaborationist schemes of Darlan and Laval for closer association with Hitler. In the fall of 1941 he was dispatched by Pétain to inspect Vichy's defenses in North Africa. It was then widely rumoured that he would replace Gen. Weygand as Vichy's proconsul in Africa. It was on his return from this trip that he was killed in a plane crash near Nîmes, France, Nov. 12.

Hurdling: *see* TRACK AND FIELD SPORTS.

Hygiene, Industrial: *see* INDUSTRIAL HYGIENE.

Hymans, Paul (1865–1941), Belgian statesman, was born March 23 at Ixelles, Brussels. The son of a prominent member of the Belgian Royal academy, and a successful barrister in his own right, Hymans was appointed minister of state on the date that Belgium received the German ultimatum in 1914. He was one of the three ministers to draft his government's reply to the Germans. He served as minister of foreign affairs from 1918 to 1920, 1924 to 1925, 1927 to 1934 and from Nov. 1934 to March 1935, serving thereafter as minister without portfolio. He died in Nice, France, March 8. (See *Encyclopædia Britannica.*)

Hyvernat, (Eugene-Xavier-Louis) Henry (1858–1941), U.S. orientalist and educator, was born June 30 in Saint-Julien-de-Jarrêt, France. He received his doctor of divinity degree from the Pontifical university in Rome in 1882 and was ordained in the same year. He was professor of Assyriology and Egyptology at the Roman seminary and interpreter of oriental

languages at the Sacred Congregation de Propaganda Fide, Vatican City. In 1889 he went to the U.S., where he joined the faculty of the Catholic University in America, Washington, D.C., as professor of oriental languages. He later became professor of biblical archaeology and organized and headed the department of Semitic and Egyptian languages and literature. Mgr. Hyvernat contributed articles to the Catholic and Jewish encyclopaedias and wrote many books. He was a fellow of the American Academy of Arts and Sciences and in 1938 was named apostolic protonotary by the late Pope Pius XI. Mgr. Hyvernat died in Washington, D.C., May 29.

ICC: *see* INTERSTATE COMMERCE COMMISSION.

Ice Hockey. Winter's ace sport indoors and out attracted more than 5,000,000 spectators during 1941. Second only to basketball in popularity, hockey's annual expenditure for admissions to games, salaries and equipment topped $8,000,000. Professional games took first interest, but amateur teams also had large followings. Among the pro teams the Boston Bruins was a wonder team, victorious in winning the hockey championship of the world (the Stanley cup) and the national league title. In 23 straight games they bested their opponents until finally halted by the New York Rangers, winners of 19 games during the 1939–40 season. The Bruins finished first in the league race, for the third successive year, and led over the second-place Toronto Maple Leafs in the playoff for the cup. Later against the Detroit Red Wings, the Bruins took four straight in a four-out-of-seven sectional series.

The Washington Eagles took the championship of the Eastern league. After leading all the way the Cleveland Barons won the American League title, and the St. Louis Flyers won the title of the American association. With the Canadian colleges out of hockey competition because of the war, Princeton won the Quadrangular League race, replacing Yale, with Dartmouth third and Harvard last.

The Regina Rangers captured the Allen cup, emblematic of Canadian amateur hockey supremacy. Canada's junior championship and Memorial cup was won by Winnipeg. The St. Nicholas Hockey club team defeated the Clinton Hockey club for the well conducted national A.A.U. championship in New Haven, Conn., among six teams. Nine district associations in the A.A.U. held annual championship games in the eastern and midwestern states. N.Y. Exchange Brokers took the crown in the Metropolitan Hockey league. Manual Training high school was triumphant over all high schools in New York for the P.S.A.L. crown.

Many of the individual honours in professional hockey were scooped up by the Bruins, including the Hart trophy for the most valuable player to his team, awarded to Bill Cowley, centre. The Lady Byng trophy, for the best conduct on the ice, was presented to Bobby Bauer, Boston's right wing. Walter (Turk) Broda, of the Maple Leafs, won the goal-tending award, the George Vezina trophy, and the Calder trophy for the season's best rookie was voted to Johnny Quilty, of the Canadians. (J. B. P.)

Iceland. An island state of the north Atlantic. Area, 39,709 sq.mi.; pop. (1939 est.) 120,264. Capital, Reykjavik, the only large town (pop. in 1939, 38,219). Religion, Lutheran Christian. Rulers: hereditarily united with Denmark, Iceland became an independent state Dec. 1, 1918, legally united with Denmark only by recognition of a common king. After April 9, 1940, the executive power was wielded by the Icelandic ministry, with a regent, Sweinn Björnsson.

History.—Icelanders were beginning to adjust themselves in 1941 to the British military occupation, which had existed since May 10, 1940. It was difficult socially to handle thousands of soldiers in an island whose total population was only 120,000, and especially because the only city had a population of less than 40,000. Yet Britain's agreement to take all Iceland's export produce, at good prices, eased the economic situation.

But complications thickened when, early in July 1941, United States marines landed on the island, to be reenforced later by more U.S. troops in unknown number. The step was taken after consultations between the British and United States governments, and a direct exchange of messages between President Roosevelt and Prime Minister Hermann Jonasson of Iceland. Jonasson set up eight conditions for the admission of U.S. forces, and Roosevelt accepted them. Chiefly they were: recognition of Icelandic independence and sovereignty both at the time of occupation and after the war; organization of defense with sufficient force and materiel, and by picked men; arrangements to assure Iceland's markets and supplies.

British forces were undoubtedly diminished as the Americans arrived, but were not entirely withdrawn. Relief of the British and closer guarding by the United States of its sea lanes were the primary reasons for the move. The question remained undetermined whether Iceland belongs in the western hemisphere or the eastern. By August the Americans were comfortably established in heated corrugated iron huts, with ample supplies of clothing and food.

The threat from Germany was dramatized in Aug. 1941, when a nazi bomber appeared, and many times later as damaged merchant naval vessels limped into the harbour of Reykjavik. Despite the obvious danger, and despite a favourable commercial agreement with the United States reached in August, people were discontented with conditions, especially with rising living costs. Disputes increased, and in October the ministry resigned. Nine days later (Oct. 31) it returned to office after an appeal from the regent.

A BRITISH GUNNER (left) and a U.S. marine exchanging greetings in Reykjavik during the landing of the U.S. forces in Iceland July 7, 1941

Finance.—Monetary unit: krón=18 U.S. cents (1939); in 1939 government revenues were 19,930,879 krónur; expenditures, 19,378,318 kr.; national debt, 56,648,000 kr.; notes in circulation, 14,000,000 kr.; gold reserve, 5,762,000 kr.; bank capital and reserves, 17,577,000 kr.; bank deposits, 76,720,000 kr.; total bank funds, 48,997,000 kr.

Trade.—Exports in 1939 totalled 69,654,000 kr.; chief articles of export were fish, salted and dried (17,228,000 kr.); fish oil (12,491,000 kr.); herring (11,800,000 kr.); fresh fish (8,988,000 kr.); fish flour (7,291,000 kr.); sheepskins, etc. (3,309,000). Imports in 1939 totalled 61,639,000 kr. The chief imports were gasoline (9,672,000 kr.); textile manufactures (6,583,000 kr.); metal wares (5,182,000 kr.); wood (5,483,000 kr.); machines (4,727,000 kr.); automobiles, etc. (3,638,000 kr.). Great Britain took most of Iceland's exports in 1939 (11,794,000 kr.), followed by Sweden (8,517,000 kr.); Denmark (7,708,000 kr.); Germany (7,488,000 kr.) and the United States (7,378,000 kr.). Great Britain also was first in supplying Iceland's imports, with goods valued at 13,785,000 kr. Denmark was second (12,684,000 kr.) and Germany was third (10,125,000 kr.).

Communication.—Highways (1936) totalled 2,728 mi., of which 1,736 mi. were improved and 992 mi. were unimproved. Miles of telegraph lines (1939): 9,700.

Agriculture.—In 1938 the chief products with their yields in tons were as follows: hay (269,024), potatoes (13,160), turnips (2,856). The 1938 census of livestock showed 591,948 sheep, 89,664 poultry, 49,018 horses, 36,696 cattle, 5,337 fox, mink, etc., 1,740 goats, 632 pigs. (F. D. S.)

Ice Skating.

Ralph McCreath, of Toronto, scored 1,575·8 points against 1,575 for Eugene Turner, of Los Angeles, the winner in 1940, for the North American figure skating championship. The excellent free skating and spectacular jumps of McCreath, of Toronto, won the title. Miss Rose Thacker, of Winnipeg, retained her women's North American crown, and Miss Eleanor O'Meara, of Toronto, and McCreath surpassed the others in winning the North American pair championship.

In the national championship of the U.S., Turner won the men's singles for the second year in a row, and Miss Jane Vaughn, University of Pennsylvania coed, triumphed in the women's competition. The national pairs title was won by Miss Donna Atwood and Turner, both from the west coast.

First among speed skaters in the U.S. was Ken Bartholomew, of Minneapolis, who won the two most important outdoor championships, the North American and the National, dethroning the great Leo Freisinger, of Chicago, the Olympic champion. The senior women's laurels went to Miss Carmelita Landry, of Fitchburg, Mass. Ted Ellenwood, of Ft. Johnson, N.Y., won the men's Middle Atlantic and N.Y. state titles, and Miss Virginia Jahn, of Cresskill, N.J. took the women's Middle Atlantic crown.

(J. B. P.)

Idaho.

One of the far northwestern states, belonging to the group regionally designated as the U.S. Pacific northwest; admitted to the union July 3, 1890; popularly known as the "Gem state." Area, 83,557 sq.mi.; pop. (1940) 524,873 (rural 66·3%, urban 33·7%). There were 3,638 Indians in the state. Capital, Boise (26,130). Other principal cities are Pocatello (18,133), Idaho Falls (15,024), Nampa (12,149) and Twin Falls (11,851).

History.—No general election was held in 1941 and there were no sessions of the legislature. State officers in 1941 (terms expiring in 1942) were as follows: governor, Chase A. Clark; lieutenant governor, Charles C. Gossett; secretary of state, George H. Curtis; attorney general, Bert H. Miller; auditor, Calvin E. Wright; treasurer, Myrtle P. Enking; superintendent of public instruction, C. E. Roberts; mine inspector, Arthur Campbell.

Education.—School population in 1941 was 120,987. There were 86,829 pupils and 3,107 teachers in 1,012 elementary schools, and 34,158 students and 1,405 teachers in 183 accredited high schools. The state university is at Moscow, with a student enrolment of 3,770 in 1941, and 275 members of faculty; the southern branch at Pocatello had 974 students and 85 teachers. There are two state normal schools, one at Lewiston and one at Albion; the combined enrolment in 1941 was 1,043 and there were 63 faculty members.

Correction.—The industrial school at St. Anthony had 174 inmates in 1941. The penitentiary at Boise had 243 inmates on Dec. 31; expense for 1941 was $137,115.

Communication.—Idaho in 1941 had 4,857 mi. of state highways, built at a cost of $116,854,475; also 33,000 mi. of county and forest roads. There were approximately 2,894 mi. of railroads, four major airports and many private and forest-service landing fields. In 1941 there were 58,169 telephones in use.

Banking and Finance.—On Dec. 31, 1941, there were 33 state banks with capital of $1,275,100; deposits of $24,242,249 and resources of $28,971,258. Fifty-five national banks had capital of $4,055,000 and resources of $107,088,288. The state's assessed valuation for 1941 was $393,234,561. State treasurer's receipts for 1941 were $35,261,792; disbursements, $34,305,764; balance on Dec. 31, $6,929,007. State indebtedness was $3,138,636.

Agriculture.—The 1941 farm census reported 43,663 farms with a valuation of $339,194,391. The total value of crops in 1941 was $89,587,000, as compared with $61,744,000 in 1940.

Table I.—*Principal Agricultural Products of Idaho, 1941 and 1940*

Crop	1941	1940
Wheat, bu.	27,822,000	24,383,000
Corn, bu.	2,385,000	2,070,000
Oats, bu.	6,680,000	5,904,000
Barley, bu.	11,400,000	8,250,000
Sugar beets, tons	820,000	1,141,000
Dry beans, 100-lb. bags	1,888,000	1,701,000
Seed peas, bu.	1,694,000	910,000
Hay (all kinds), tons	2,301,000	2,415,000
Potatoes, bu.	27,450,000	33,280,000

Manufacturing.—There were 533 manufacturing establishments (1940) with 12,797 workers and pay roll of $16,249,685.

Mineral Production.—Total value of mineral production for 1941 was $41,357,800 for the five leading metals. In 1941 there was the largest output of gold since 1871, and the largest production of zinc in the history of the state.

Table II.—*Principal Mineral Products of Idaho, 1941 and 1940*

Mineral	Value, 1941	Value, 1940
Gold	$ 5,250,000	$ 5,075,000
Silver	11,808,000	12,250,000
Copper	912,600	757,100
Lead	11,592,000	10,380,000
Zinc	11,795,999	9,184,500

(B. De.)

Illinois.

A north central state of the United States, admitted to the union in 1818, nicknamed the "Sucker state," sometimes called the "Prairie state." Total area, 56,400 sq.mi. of which 55,947 sq.mi. are land. Pop. (1940) 7,897,241, including 3,967,481 males and 3,929,760 females; 7,503,987 white, 393,254 nonwhite. Population classed as urban was 5,809,650, rural not on farms 1,121,823, rural farm 965,768. Springfield, the state capital, with a population of 75,503, is the fifth Illinois city in size. Chicago (3,396,808) is the largest Illinois city, followed by Peoria (105,087); Rockford (84,637); East St. Louis (75,609).

History.—War and preparation for it overshadowed political life in Illinois in 1941. The year closed with the general assembly in special session to consider new legislation to enable the state to co-operate better with the national government; appropriations of $16,000,000 were asked for this purpose by Governor Dwight H. Green. The previous session of the legislature passed 650 bills, 88 of which were vetoed by the governor. The legislature refused to carry out the constitutional mandate to reapportion the legislative and congressional representation of the state, with the result that Illinois legislative and congressional districts in 1941 were still based on the census of 1900. Thus the population of Chicago was underrepresented both at Springfield and Washington. The state sales tax was reduced from three to two cents per dollar, but improved business prevented a decrease of revenue. Additional taxes were laid on cig-

arettes, liquor and oil. Women were made eligible to serve on grand juries, and election bribers were made liable to the same punishment as bribe takers. Appropriations aggregated slightly more than $510,000,000 for the legislative biennium.

Hugh W. Cross was lieutenant governor of Illinois in 1941; Edward J. Hughes, lone Democrat official, secretary of state; Arthur C. Lueder, auditor; Warren Wright, treasurer; and George F. Barrett, attorney general.

Education.—Illinois public schools are administered by some 12,000 local boards, which levy the bulk of the taxes for their support. Over this localized system there is a state school superintendent elected by popular vote in "off years." A state distributive fund supplements local taxation. In 1941 this fund took 12.87¢ of every dollar of state revenue. It was distributed as follows: for local school aid, $16,161,659; for the University of Illinois, $8,693,313; for normal schools, $3,155,676; for handicapped children, $1,653,100; for vocational education and rehabilitation $326,645; for blind and deaf schools, $552,688; for interest on school fund, $57,000.

In 1939 total enrolment of schools was 1,314,178, of whom 372,471 were in high schools. These figures do not include parochial and private schools. (*See* also ILLINOIS, UNIVERSITY OF.)

Public Welfare, Charities, Correction.—Increase of employment in the first 16 months after the national defense program was launched had taken 345,339 off relief rolls in Illinois by the latter part of 1941. On Oct. 1, 1941, 297,206 persons were still in receipt of general relief, however, and there were 213,375 working on WPA projects; 148,128 were receiving old-age assistance, 17,057 mothers' pensions and 7,277 pensions for the blind. Total expenditures by the state for relief and welfare were $237,790,316 for the fiscal year. Illinois maintained 10 hospitals for the insane in 1941 and two for the feeble minded. There were seven penal institutions, including two main penitentiaries and a woman's reformatory.

The state also supported schools for the blind and deaf and other institutions of a benevolent nature. Including private hospitals and orphanages there were about 475 institutions for various sorts of philanthropy apart from schools and libraries. The Illinois old-age pension system established in 1935 was a greater responsibility to the state in 1941 than were the schools, as the pensions, amounting to $40 per month, were paid altogether out of general state revenues.

Communication.—The state highway department of Illinois had under its supervision in 1941, 68,549 mi. of road, with a yearly expenditure for all purposes of $68,549,000. The state's railroad mileage was 11,981.

Finance and Banking.—The tax burden in Illinois in 1941, exclusive of federal taxes, was $619,025,000, or $78.24 per capita. Local taxes amounted to $359,653,000, state taxes to $259,372,000. At the end of the fiscal year 1940–41, the Illinois treasury had a balance of $289,520,944, but of this amount $211,305,902 belonged to the unemployment insurance fund. The sales tax, which yielded $101,760,954, was the state's greatest source of revenue. The gross debt of the state June 30, 1941, was $160,783,000, the net debt, $153,442,000. There were 329 national banks in Illinois with deposits of $2,864,376,000, loans of $745,220,000 and investments of $1,573,220,000. State banks and trust companies numbered 512, with deposits of $1,164,541,000; loans, $308,416,000; investments, $546,423,000.

Agriculture.—The value of Illinois farm crops in 1941 was $497,762,000, harvested from 18,617,000 acres. Combined cash income of Illinois farms from all sources was $644,000,000, including $36,000,000 of government payments under AAA.

Table I.—*Leading Agricultural Products of Illinois, 1941 and 1940*

Crop	1941	1940
Corn, bu.	401,362,000	328,735,000
Soybeans, bu.	49,128,000	34,612,000
Oats, bu.	154,112,000	148,320,000
Winter wheat, bu.	55,300,000	38,925,000
Tame hay, tons	3,619,000	4,237,000

Manufacturing.—The value of products manufactured in Illinois in 1939, according to the U.S. biennial census, was $4,794,860,733; the number employed was 688,800; total wages and salaries were $988,453,881. The principal industries and the value of their products were as follows: meat packing, $479,501,224; steelworks and rolling mills, $207,301,815; petroleum refining, $122,933,528; tractors, $121,550,621.

The third great government munitions plant in Illinois, at Crab Orchard lake near Carbondale in the southwestern part of the state, was dedicated Oct. 19, 1941. The $51,000,000 ordnance works at Kankakee began production of explosives Sept. 26, and the first fuses were assembled at the great Elwood plant Dec. 2. These giant plants, covering thousands of acres each, were but open field and forest late in 1940. Activity there was typical of armament production, public and private, in every Illinois industrial district.

Mineral Production.—The total value of minerals produced in Illinois in 1939 was $210,295,738.

Table II.—*Production of Coal and Petroleum in Illinois, 1940 and 1939*

	1940	1939
Bituminous coal, tons	45,977,479	47,627,454
Petroleum, bbl.	146,788,000	94,912,000

Estimated oil production for 1941 was 140,000,000 barrels. Estimated coal production was 47,000,000 tons. In 1939 the value of leading minerals was as follows: petroleum, $101,200,000; coal, $76,178,000; pig iron, $57,718,814; coke, $11,963,932; stone, $7,820,589. (L. H. L.)

Illinois, University of. An institution of higher education at Urbana, Ill. Enrolment in the university for the first semester of 1941–42 was 13,060 (Nov. 1, 1941 count), a drop of 7.6% from that of the first semester, 1940–41. The decrease was attributed to the selective service act and to better industrial opportunities for students. During 1941 the university conducted, at federal expense, defense training classes in engineering, science and industrial management for 5,000 workers in several parts of the state. University staff members were released for special defense activities. Military training was given new emphasis, with 4,243 cadets, exclusive of military bands, in the R.O.T.C. and 595 in the advanced course leading to army commissions. Some 4,000 alumni, commissioned from the R.O.T.C., were on active duty.

The university's facilities were extended during the year by expansion of the Illinois Medical centre on Chicago's west side. To the colleges of medicine, dentistry and pharmacy were added the Illinois Educational and Research hospital and the Institute for Crippled Children, taken over from the state department of public welfare. Presbyterian hospital became affiliated with the university, and the staff of Rush Medical college was joined to that of the university. A student union was opened for Chicago students. At Urbana the $1,500,000 Illini Union building was opened in February and was dedicated by Gov. Dwight H. Green in November. A much-needed power plant was put into use. Total value of the university's plant, not including the additions at Chicago, reached $36,781,884.

Total enrolment for the 12-month period ending June 1, 1941, was 17,392. This figure does not include some 1,200 correspondence students. The university staff totalled 2,247 persons. The library, fifth in size among those of U.S. educational institutions, contained a total of 1,635,657 items, of which 1,262,046 were bound volumes and the rest pamphlets, maps and sheet music. The university budget for 1941–42 was $10,436,652, of which $6,506,462 was from tax revenues.

Illiteracy. During 1941, because of wars and upheavals over wide areas of the globe, there was a net loss in the world's efforts to reduce illiteracy and in other movements toward popular education. Germany, which before World War I had established a high record in all forms of education, had deteriorated because of concentration on military enterprises.

In the countries of Czechoslovakia, Poland, Holland, Belgium, Norway, France and the Balkans there had been such national disturbances because of invasion that education suffered along with all other public services. China, with the greatest number of illiterates of any nation in the world, was compelled by the Japanese invasion to abandon her efforts to teach the masses to read through a simplified "alphabet" of 1,000 characters. The Union of Soviet Socialist Republics, where mass education had reduced illiteracy from the 75% of 1895 to less than 30% in 1937, had to concentrate all its resources on fighting the war with Germany. All the countries of eastern and southern Europe were too busy with wars and the threats of war to make any concerted efforts toward popular education and national literacy. India and Egypt reported illiteracy of over 80% of the population. In late years Mexico and other Latin American nations had been making heroic efforts to improve the education of their people, but illiteracy in all these countries continued to be exceedingly high in 1941. In Mexico nearly 60% of the population over ten years of age was unable to read or write.

The United States of America was one of the few countries to continue to make progress in the reduction of illiteracy during 1941. An effort to make the whole nation literate continued to be the chief item in the adult education program of the Work Projects administration, under which approximately 2,000,000 people were taught to read and write in the years from 1933–41.

During 1941 this administration added special programs for the reduction of illiteracy among registered aliens and among selective service registrants rejected for military service because of inability to pass a fourth grade examination. In 1930—the last year for which comprehensive figures were available—the U.S. had 4,283,753 illiterates over ten years of age, or 4.3% of the population of that age.

While Negroes showed the highest illiteracy of any large group of the U.S. population (16.3%), they made the greatest recent progress. At the time of emancipation in 1863 it was estimated that of the 4,500,000 slaves and "free persons of colour" in the U.S. less than 5% could read and write; in 1940 the 13,000,000 U.S. Negroes had an estimated literacy rate above 85%. (*See* also CENSUS, 1940.)

Unfortunately the 1940 census figures do not include illiteracy statistics, since the latest census form substituted a query concerning highest grade of school completed for the customary record on illiteracy. It is estimated, however, that the U.S. population over ten years of age was 97% literate in 1941.

(E. R. E.)

Illumination: *see* ELECTRICAL INDUSTRIES.

I.L.O.: *see* INTERNATIONAL LABOUR ORGANIZATION.

Immigration and Emigration, U.S.

The immigration and emigration of aliens are controlled in the United States by treaties, legislation and administrative regulations. The principal treaty and laws affecting such control are mentioned below. The treaty with China of 1880 and the Chinese Exclusion act of 1882, as amended, virtually prohibited the permanent admission of aliens of the Chinese race. The act of Feb. 5, 1917, provided general tests of admissibility to the United States and the procedure for the inspection of applicants for admission. Under this act aliens who do not satisfy certain mental, physical, moral and economic requirements are excluded and deported from the United States. The act of May 26, 1924 provided for consular inspection of applicants for admission to the United States, specifies the requirements for immigration visas, and permits only a limited number of immigrants of each of certain nationalities to be admitted to the United States each year for permanent residence.

Table I.—*Number of Aliens Registered in the United States* Classified by Continent and Country of Birth*

	Total	Per Cent
Recapitulation by Continent		
Total	4,921,452	100.0
Europe	3,572,911	72.7
North and Central America	1,050,450	21.3
Asia	173,160	3.5
Oceania	93,976	1.9
South America	21,300	.4
Africa	5,950	.1
Other	4,515	.1
Fifteen Countries With Largest Number of Aliens		
Italy†	695,363	14.1
Canada	448,012	9.1
Poland	442,553	9.0
Mexico	416,893	8.5
Russia‡	366,842	7.5
Germany	314,715	6.4
Great Britain§	291,593	5.9
Austria	191,594	3.9
Irish Free State	158,249	3.2
Hungary	116,696	2.4
Sweden	102,178	2.1
Austria-Hungary	94,510	1.9
Japan¶	91,858	1.9
Lithuania	86,835	1.8
Philippine Islands	83,677	1.7

It should be noted that the figures presented in this table do not include those aliens who registered as alien seamen or those who registered through consular officials.

*Includes the territories of Alaska and Hawaii, District of Columbia, Puerto Rico and the Virgin Islands.

†Does not include Italian African possessions.

‡Includes Russia in Asia.

§Does not include Northern Ireland, British Asiatic possessions, British Pacific possessions, British African possessions, British West Indies and British Guiana.

¶Does not include Chosen and Japanese Pacific possessions.

These restrictions do not apply to specified "nonquota" groups, including, among others, returning alien residents and persons born in Canada, Newfoundland, or an independent American country.

Alien Registration.—The Alien Registration act, 1940, required that a record be made and kept current of aliens in the United States. All aliens (except foreign government officials and members of their families) who remain in the United States, including Alaska, Hawaii, Puerto Rico and the Virgin Islands, 30 days or longer, must be registered, and, if 14 years of age or over, be fingerprinted. The number of aliens thus shown to be in the United States and its territories as of Oct. 24, 1941, was 5,138,126.

Emergency Control Over Aliens.—Effective Dec. 1, 1941, additional restrictions were placed upon the entry and exit of aliens generally. Per-

Table II.—*Number of Aliens Registered in All States of the U.S. Classified by Country of Birth*

Name of Country	Total
TOTAL ALL COUNTRIES	4,921,452
Europe	
Austria	191,594
Austria-Hungary	94,510
Belgium[1]	15,766
Bulgaria	4,491
Czechoslovakia	72,068
Denmark (incl. Faeroe Islands)	29,742
Estonia	1,890
Finland	50,326
France (incl. Corsica)[2]	33,334
Germany	314,715
Great Britain (incl. England, Scotland and Wales)[3]	291,593
Northern Ireland	30,664
Irish Free State (Eire)	158,249
Greece	82,398
Hungary	116,696
Italy (incl. Sicily and Sardinia)[4]	695,363
Latvia	7,054
Lithuania	86,835
Netherlands[5]	32,419
Norway	67,818
Poland	442,553
Portugal (incl. Azores, Cape Verde and Madeira Is.)[6]	73,607
Rumania	32,164
Russia (incl. Russia in Asia)	366,842
Spain (incl. Canary and Balearic Islands)[7]	39,670
Sweden	102,178
Switzerland	24,196
Turkey (incl. Turkey in Asia)	44,340
Yugoslavia	55,904
Other Europe (incl. Aegean Is., Albania, Andorra, Castelrosso, Danzig, Gibraltar, Iceland, Liechtenstein, Luxembourg, Malta, Monaco, Moresnet, San Marino)	13,230
Europe not specified	12
Asia	
Arabia (Saudi)	596
China	40,244
India	3,896
Iraq (Mesopotamia)	466
Japan[8]	91,858
Korea	3,522
Palestine and Trans-Jordan	2,812
Iran (Persia)	1,972
Thailand (Siam)	148
Syria and Lebanon	24,940
French Asiatic possessions	65
British Asiatic possessions	2,362
Portuguese Asiatic possessions	31
Other Asia (Afghanistan, Nepal, Bhutan, Oman, Yemen)	248
Oceania	
Australia (incl. Papua, Tasmania and mandated is.)	3,078
New Zealand (incl. mandated is.)	1,365
French Pacific possessions	115
British Pacific possessions	135
Japanese Pacific possessions	38
Netherlands Pacific possessions	537
Portuguese Pacific possessions	9
Philippine Islands	83,677
U. S. provinces and possessions[9]	4,089
Other Pacific	33
Africa	
Egypt	1,244
Ethiopia (Abyssinia)	44
Liberia	219
Union of South Africa (incl. mandates)	1,566
Belgian African possessions	34
French African possessions	904
British African possessions	644
Italian African possessions	76
Portuguese African possessions	68
Spanish African possessions	53
Other Africa (Tangier)	108
North and Central America	
United States[10]	71,072
Canada	448,012
Newfoundland	14,452
Costa Rica	1,111
El Salvador	1,011
Guatemala	1,074
Honduras	1,053
Mexico	416,893
Nicaragua	1,412
Panama	2,143
Cuba	13,433
Dominican Republic	2,557
Haiti	626

Name of Country (*Continued*)	Total
North and Central America (Cont'd)	
British West Indies (incl. British Honduras)	62,005
Netherlands West Indies	1,511
Panama Canal Zone	352
Other North and Central America and West Indies (incl. Alaska, Puerto Rico, American Virgin Is., St. Pierre, Miquelon, The French West Indies)	11,733
South America	
Argentina	3,812
Bolivia	175
Brazil	4,003
Chile	1,725
Colombia	2,761
Ecuador	825
Paraguay	42
Peru	1,375
Uruguay	401
Venezuela	2,792
British Guiana	2,253
Netherlands Guiana	274
French Guiana	20
Other South America	32
Other	
Unknown[11]	3,059
On board ship[12]	659
None or blank[13]	797

It should be noted that the figures presented in this table do not include those aliens who registered as alien seamen or those who registered through consular officials.

[1]See also Belgian African possessions.

[2]See also French Asiatic possessions, French Pacific possessions, French African possessions, other North America and West Indies and French Guiana.

[3]See also Northern Ireland, other Europe, British Asiatic possessions, British Pacific possessions, British African possessions, British West Indies and British Guiana.

[4]See also Italian African possessions and other Europe.

[5]See also Netherlands Pacific possessions, Netherlands West Indies and Netherlands Guiana.

[6]See also Portuguese Asiatic possessions, Portuguese Pacific possessions and Portuguese African possessions.

[7]See also Spanish African possessions.

[8]See also Korea and Japanese Pacific possessions.

[9]Includes the Territory of Hawaii and islands of Guam, American Samoa, Wake, Jarvis, Baker and Howland.

[10]Includes those registering as aliens, but claiming United States as country of birth.

[11]Includes those registering as aliens who profess not to know where they were born.

[12]Includes those registering as aliens claiming birth on board a ship of indeterminate registry or on ships of nations which do not claim as citizens those born on ships of their registry.

[13]Includes those registering as aliens who make no return for country of birth.

mits to enter or depart were required, unless the aliens concerned fell within certain specified groups of emergency cases. An alien applicant for entry must be sponsored by U.S. citizens or resident aliens. Appropriate procedural forms might be obtained from the department of state or the immigration and naturalization service. Aliens whose entry or departure would be prejudicial to the interests of the United States were not allowed to enter or depart.

After Dec. 7, 1941, natives, citizens, denizens, or subjects of nations with which the United States was at war, 14 years of age and upward, in the United States and not naturalized, were declared to be alien enemies. As such their movements and activities within the United States were substantially restricted. Among other prohibitions, they might not give information to the enemy or interfere by word or deed with the defenses, political processes, or public opinions of the United States. They were barred from entering restricted areas. Nor might they make any air flight, or move from place to place, or change their abodes or occupations without compliance with such regulations as might be promulgated. Moreover, they were required to turn over to the government certain types of property, including among others, firearms, short-wave radio receiving sets and cameras, which might be used in espionage or subversive activity.

Alien enemies considered dangerous or who violated the restrictions were subject to summary apprehension. They were then to be given hearings to determine whether they should be interned permanently, released under bond, or released without bond.

Activities of Immigration Officers.—The administration of the laws relating to immigration and emigration of aliens is under the direction of the special assistant to the attorney general in charge of the immigration and naturalization service, except insofar as the issuance of permits to enter and depart is under the control of the secretary of state.

Officers of the immigration and naturalization service passed upon 40,424,978 alien and citizen entries into the United States during the fiscal year ended June 30, 1941, of which 38,974,008 were across the land borders. This latter number included 4,096,470 alien entries and 11,357,962 citizen entries from Canada, and 14,521,163 alien entries and 8,998,413 citizen entries from Mexico. Aliens numbering 51,776 entered the United States for permanent residence, and 17,115 departed for residence elsewhere. During the period 2,929 aliens were excluded. Of those entering for permanent residence 26,541 were from Europe, 22,445 from the Americas, and 2,790 from Asiatic and other sources.

Immigration officers boarded 39,739 vessels and inspected 1,846,913 alien and citizen seamen, both arriving and departing. They also examined the passengers and crews of 7,906 aircraft. Immigration border patrol officers patrolled 12,207,780 mi., examined 2,001,891 conveyances, and questioned 3,518,353 persons. As a result of this activity 12,649 persons were apprehended and 210 conveyances seized.

During the fiscal year 1941, 4,407 aliens were deported, while 6,531 aliens who were adjudged deportable were allowed to depart at their own expense without warrants for deportation. (*See* also CENSUS, 1940; REFUGEES.) (L. B. S.)

Imports: *see* INTERNATIONAL TRADE; TRADE AGREEMENTS.

Income Tax: *see* TAXATION: *Income Tax.*

India. A subcontinent projecting from the mainland of Asia, India lies between the 8th and the 37th degrees of north latitude. It comprises 11 major or "autonomous" provinces, five minor areas directly administered by the central British government, and between 500 and 600 states under Indian rulers. The latter are scattered about the subcontinent and vary greatly in size and importance, as well as in the powers enjoyed by their chiefs. British India (the 16 major provinces and minor areas) has its capital at New Delhi and is under a viceroy and governor general (the Marquess of Linlithgow after April 1936), who is also the representative of the crown in its relations with the native states. The total area is 1,575,187 sq.mi., of which the native states and agencies total 712,508 sq.mi.; pop. (est. 1941 census) 388,800,000. Chief cities (pop. census 1931): Calcutta (1,485,582); Bombay (1,161,383); Madras (647,230); Hyderabad (466,894); Delhi (447,442); Lahore (429,747). Languages, Hindi, Bengali and Urdu the most important; religions, Hinduism (approx. two-thirds), Mohammedan (approx. one-fifth). Ruler, George VI, emperor.

History.—The political stalemate from which India suffered in 1940 continued through 1941. In Aug. 1941 the viceroy (the Marquess of Linlithgow) had held out an olive branch, offering to enlarge his executive council by bringing in more Indians and to set up a war advisory council of leading Indians; at the same time he promised that, after the war, a body representative of the principal elements in Indian national life would be convoked to frame a constitution for the country. This offer was rejected both by the congress (mainly composed of Hindu nationalists) and by the Moslem league; by the former on the ground that they should first have a guarantee that India would be completely freed from the British connection; by the latter, as they would not tolerate any constitution with a Hindu majority. The viceroy, complaining with some justice that no constructive proposal ever came from the other side, expressed his inability to make any further offer; whereupon Mohandas Gandhi (*q.v.*) initiated a pacifist campaign, with instructions to his supporters to stir up popular feeling against the national war effort. As the agitation spread, the government considered it had no alternative except to arrest the leading spirits, including the president of the congress and Pandit Jawaharlal Nehru. In vain Leopold Amery, the secretary of state for India, arguing that any future federal government must rest on an agreement between the main elements in the nation, pleaded for a united front against the nazi danger, now threatening the east as well as the west. The congress retorted that if India were made independent Gandhi's nonviolent soul-force would soon put an end to the war. The response of the president of the Moslem league (Mahomed Ali Jinnah) was equally uncompromising. He spurned any idea of co-operation with the Hindus, as it would inevitably mean majority rule—a democratic principle which he categorically repudiated. If the congress should prevail in its demand for independence, he insisted that India must be partitioned, and out of its northwestern and northeastern zones a new Moslem state (Pakistan, or land of purity) must be created, with complete autonomy and full control over its own foreign and domestic affairs. In December a fresh start was attempted by the government, and the passive-resistance prisoners were released. To judge by the tone of a speech which Nehru broadcast immediately on leaving prison, no change of heart followed; but all this mimic warfare collapsed when Japan drew the sword and her bombers raided Rangoon. The country was already wearying of the wrangle, and the membership of the congress shrank from 4,500,000 before the war to barely 1,500,000 in 1941, while impatience increased

among the Moslems with Jinnah's dictatorial methods. In March 1941 a conference of the Indian Liberals asked for a reconstruction of the viceroy's cabinet; and the princes pressed for a war advisory council. This gave the government an opening for reviving and revising its former offer; and in July it was announced that the viceroy's cabinet would be enlarged from 7 to 12 members with a majority of Indians, and that a national defense council of about 30 would be formed, to include representatives of the states as well as of the British provinces. The new portfolios were given, as Amery claimed, to anything but "yes-men"; yet within a month the Moslem league compelled the prime ministers of Punjab and Assam to resign from the defense council because they had not obtained its permission before accepting office. The Moslem premier of Bengal shortly followed suit, although at the same time he left the league in protest against Jinnah's high-handedness. Undisturbed by this contretemps, the defense council held its first meeting on Oct. 6, and appeared to function satisfactorily. In July another interesting step had been taken in the exchange of diplomatic representatives between India and the U.S.

India's War Effort.—While the wordy war of politics droned on, the people were rapidly realizing the stern reality of Hitler's war. From Europe hostilities had spread to Syria, Iraq and ultimately Iran, bringing the danger nearer and nearer home. It also brought the Indian fighting men more and more to the front, where they were making good in every field. They bore their full share of battle in Abyssinia, Libya and the middle east, having particularly distinguished themselves both in the attack on Sidi Barrani and in the second advance in Cyrenaica (Dec. 1941). A young Rajput noble, nephew of "Ranji" of cricket renown, was given the D.S.O. for gallant conduct in Libya, and two Indian officers (one posthumously) won the Victoria Cross. The royal Indian navy, with its youth renewed, not only was doing useful work in its home waters but also was taking a hand in the battle of the Atlantic. Sir Claude Auchinleck (*q.v.*), with 37 years of Indian service, became commander in chief in the spring of 1941; his appointment was popular but short, as in July he exchanged posts with General Sir Archibald Wavell (*q.v.*) and took over the conduct of the war in the middle east.

During 1941 the role of India as a reservoir of men and military supplies developed rapidly. Recruits kept pouring in to the Indian regiments, latterly at the rate of 50,000 a month; and by September 1,000,000 men were under arms, of whom more than 100,000 were serving overseas. The territorial force was given the option of being converted into regular units, and 75% of the men volunteered for full service. Air-raid precaution work was eagerly taken up in the large cities, and in Calcutta a civic guard was enrolled for that purpose and for auxiliary police duties. As to supplies, great strides were made in the production of munitions of almost every kind—rifles, machine guns, shells, fuses, mortar bombs, anti-tank mines, Bren-gun parts and nitric acid. Broadcasting in July, the supply member of council disclosed that the output of guns was five times greater and of filled shells 24 times greater than in peacetime. Besides the needs of its own forces the country had met orders for 60,000 filled shells and 150,000,000 rounds of small-arm ammunition. Thanks to the provision by the United States of certain essential machine tools, aircraft were being assembled, and the first plane to be thus completed did its test flight in the summer. Plans matured for training 300 pilots and 2,000 mechanics annually. The opening of a toluene plant marked the first stage in making India self-contained in the production of high explosives. The shipyards also were busy, constructing small craft, from mine sweepers to lifeboats.

BOMB-PROOF APARTMENTS were advertised by a provident renting agent of Bombay in 1941

The monthly production of steel increased by 2,000 tons through the utilization of scrap. The jute industry gave the world 500,000,000 sandbags in the first year of the war, while 324,000,000 yd. of cloth for military clothing were undertaken in 1941. The great expansion of ordnance and general engineering plant was stimulated by the visit of the Roger mission from the British ministry of supply (winter, 1940), and by the Eastern Group conference held at Delhi in Oct. 1940. From the latter there emerged an Eastern Group supply council, which aimed at supplying from the industrial capacity within its area the whole of the military requirements of that part of the British commonwealth which lies outside the Suez canal. India, with its geographical and strategical advantages, was in 1941 sending a flow of supplies west and east—up the Persian gulf to the U.S.S.R. and along the Burma road to China. Reference to the gifts of the princes and people to every type of war charity is superfluous; every newspaper carried on the daily tale of their spontaneous generosity.

Despite ample assistance from the British treasury, the strain of war on India's finances was considerable. The central budget showed a deficit of more than £6,000,000 in 1940–41, and more than £15,000,000 in 1941–42. The figures would have been more serious were it not for the substantial contributions at last being made by the railway revenue—about £7,500,000 in each of the two years. Higher rates and fares, the curtailment of coastal steamer services and the effect of more expensive gasoline on road competition, all contributed to this result. To balance the 1941–42 account required the borrowing of about £10,000,000; the excess profits tax was raised from 50% to 66⅔%, and the surcharge on the supertax was put up from 25%, at which it had been imposed in Nov. 1940, to 33⅓%. The general position was one of con-

tinued financial strength; the repatriation of India's sterling loans was approaching completion, enabling her to shed her status as a debtor country and reducing her foreign remittances; the rupee exchange remained stable, and the inflation which characterized World War I had been avoided.

In 1941 Lord Linlithgow's term of office was extended to April 1943, the end of its seventh year.

Domestic Problems.—By far the weightiest of India's problems—vastly more important than her political logomachies—is the possibility of improving, or even maintaining, the standard of life in a population which increased by 18% in the decade 1931–41. Much was expected from the fillip which the war gave to industry. It opened up new courses of manufacture and fields of productive power which ought to help in relieving the growing pressure on the land. Active steps were being taken in 1941 to consolidate advances in this respect by extensive measures for technical training, including the sending of groups of young Indian artisans to England for practical instruction. Meanwhile general administration proceeded smoothly, although communal riots were again in evidence, at Ahmadnagar, Bombay and Cawnpore. Four provinces, with a population of roughly 100,000,000, were still working the reformed constitution, with an Indian executive responsible to an elected legislature. In the other 11, with about 200,000,000 population, the whole system of parliamentary government remained in suspense at the ukase of the congress; but the official administration which temporarily replaced it seemed to cause no dissatisfaction among the people and was carried on, so far as possible, along the lines which the previous Indian minister had laid down. In Bombay the prohibition of foreign liquor was withdrawn. On May 25 Bengal was visited by a disastrous cyclone, in which more than 4,000 lives were lost. Funds were allotted for a broadcasting house in New Delhi, to be the headquarters of the All-India radio, and for foreign transmission; and a daily wireless service was started for the information of the forces in the middle east and for the dissemination of local news. (*See* also BURMA.) (ME.)

Education.—Recognized institutions in British India (excluding Burma): primary (males): schools, 159,280; scholars, 8,242,332; (females): schools, 28,482; scholars, 2,627,615; secondary (males): schools, 11,177; scholars, 2,169,272; (females): schools, 1,510; scholars, 235,756. Colleges (males): number, 327; scholars, 123,599; (females): number, 41; scholars, 8,970. Universities: British India, 15; native states, 3.

Finance.—Revenue, central government (est. 1941–42), rupees 1,58,89,38,000; expenditure, central government (est. 1941–42), Rs.1,58,89,38,000; public debt (March 31, 1940): in India, Rs.4,50,23,00,000; in England, £280,100,000; notes in circulation (June 30, 1941), Rs.2,76,93,00,000; reserve (June 30, 1941), Rs.2,91,10,00,000 (gold, Rs.44,42,00,000; silver rupee coins, Rs.36,57,00,000; sterling securities, Rs.1,18,80,00,000; rupee securities, Rs.91,31,00,000). Currency: 1 rupee (Rs.1)=1s. 6*d.* at par; exchange rate (average 1940), Rs.1=30.16 cents U.S.; (July 1941) Rs.1=30.13 cents U.S.

Trade and Communication.—Overseas trade 1940–41: imports, merchandise, Rs.1,56,79,39,567; exports, Indian merchandise, Rs.1,86,90,50,588; re-exports, merchandise, Rs.11,81,28,111; gold and silver coin and bullion (1938–39), imports, Rs.2,77,77,737; exports, Rs.14,09,08,106; imports of Afghan merchandise (1939–40), Rs.3,97,06,671; exports of Indian produce to Afghanistan (1939–40), Rs.72,79,399.

Indian Imports and Exports 1940-41

	Imports from Rs.	Exports to Rs.
U.K.	35,96,56,904	64,97,24,750
Burma	28,36,04,071	16,23,89,707
Japan	21,54,78,290	9,00,35,095
Germany	9,16,653	...
U.S.A	27,00,62,601	25,90,71,625

Roads (March 31, 1938): British India only, 83,612 mi. motorable roads, 201,701 unsurfaced. Railways (March 31, 1939): mileage open to traffic, 41,134, of which 29,744 mi. are government owned. Shipping: tonnage entered (monthly average 1939), 924,200; tonnage cleared (monthly average 1939), 917,500. Motor vehicles licensed (Jan. 1, 1939): British India, 97,717 cars and taxis; 38,681 commercial vehicles; 8,898 motorcycles. Wireless receiving set licences (Dec. 31, 1940); 100,388. Telephones (March 31, 1940): 86,219 straight-line connections, 626 exchanges.

Agriculture, Manufacturing and Mineral Production (1939–40).—Production (in metric tons): rice, 38,532,000; wheat, 10,094,400; cane sugar, raw, 2,770,000; maize (1937–38), 2,080,800; barley (1938–39), 2,119,500; jute (1939), 1,748,100; coal (1939) (British India), 2,504,400; iron ore (metal content) (1938), 1,790,000; pig iron and ferroalloys (1939), 1,785,000; steel (1939), 1,035,000; petroleum, crude (1939), 328,000; cotton, ginned, 907,200; groundnuts, 3,050,200; tobacco, 495,800; tea (1938), 205,000; manganese ore (metal content) (1938), 492,000; linseed, 452,200; gold (1939), 12,900 kg.; bauxite (1938), 15,000; chrome ore (chromic oxide content) (1938) 22,000; rape seed, 940,900; sesamum, 421,700. Industry (excluding Burma): cotton (1938–39) yarn spun, 1,303,245,902 lb.; woven goods, 920,475,805 lb.; number of mills, 389; average number employed, 441,949. Jute (1937–38): mills, 105; average number employed, 309,000. Total number of factories (1938), 9,743; average daily number employed (1938), 1,737,755.

Indiana. A north central state, Indiana was admitted into the union Dec. 11, 1816, the date observed as Indiana day. Indiana was the 19th state in order of admission. The popular name of the state and its inhabitants is "Hoosier"; the origin (in the 1830s) of the term is unknown. The total area of the state is 36,291 sq.mi., of which 86 sq.mi. exclusive of its Lake Michigan jurisdiction are water surface. The population of Indiana in 1940 was 3,427,796, of which 44·9% was rural and 55·1% urban. Indianapolis, the capital, had a population (1940) of 386,972. Other cities are Fort Wayne (118,410), Gary (111,719), South Bend (101,268), Evansville (97,062), Hammond (70,184), Terre Haute (62,693), East Chicago (54,637), Muncie (49,720), Anderson (41,572).

History.—The most significant political development of 1941 was the struggle between the Republican general assembly, in session from Jan. 9 to March 10, and Governor Henry F. Schricker, Democrat, for the control of the state government and the appointment of state officials and employees. The assembly repealed the executive-administrative act of 1933 which gave the governor complete appointive power and centralized authority in him in many other respects. It passed numerous bills over the governor's veto creating boards consisting of the governor and two (Republican) elected officials, and giving them appointive and administrative authority over the various institutions and administrative offices of the state. After the general assembly adjourned, Governor Schricker sought and obtained a judicial injunction against action by these boards. After considerable litigation the state supreme court handed down decisions June 26, 1941, which declared most of this legislation unconstitutional and reaffirmed the appointive power of the chief executive of the state. In the exercise of this power Governor Schricker gave consideration to recommendations of heads of state institutions and, in political appointments, to recommendations of the Democratic state committee—the system generally prevailing before the highly centralized autocratic system was set up in 1933. The state personnel act which became a law on March 8 without the governor's approval, established a merit system in the state institutions, the state board of health, the department of public welfare and some other agencies.

The political alignment of state officers during 1941 was anomalous and productive of some confusion. Governor Henry F. Schricker, who began a four-year term in January, is a Democrat; the four holdover members of the supreme court (including the chief justices Michael L. Fansler, May–Nov., and Curtis G. Shake, Nov.–May 1942) are also Democrats; a solitary Republican justice was elected in 1940. The appellate court entered the year 1941 with four Democratic and two Republican justices. All the other elected state officials and a majority of the senate and the house of representatives were Republican in 1941. Charles M. Dawson was lieutenant-governor and president of the senate; James M. Tucker, secretary of state; James M. Givens, treasurer; and Richard T. James, auditor.

Education.—In the school year 1940–41 there were 2,102 elementary schools, 674 combined elementary and high schools and 165 senior, junior-senior and junior high schools. The enrolment in elementary grades was 459,434, in secondary school grades 196,795. There were 11,844 teachers in elementary grades, 1,103 in junior high school grades, and 7,843 in

senior high schools.

Indiana university at Bloomington in 1940–41 had an enrolment of 6,759 and a faculty of 507; Purdue university (Lafayette) an enrolment of 7,435 and a faculty of 489. Indiana State Teachers college (Terre Haute) had an enrolment of 2,044 and a faculty of 113; Ball State Teachers college (Muncie) an enrolment of 1,898 and a faculty of 104.

Public Welfare and Charities.—The state maintained the following "benevolent" institutions in 1941: Central State hospital (Indianapolis), Evansville State hospital, Madison State hospital, Logansport State hospital and Richmond State hospital (the five hospitals for the insane), Fort Wayne State school for mentally deficient children, Southern Indiana Tuberculosis hospital (New Albany), the state sanatorium for tuberculosis (Rockville), Muscatatuck colony for the subnormal (Butlerville), Village for Epileptics (New Castle), Soldiers' home (Lafayette), Soldiers' and Sailors' Children's home (Knightstown), School for the Deaf, School for the Blind and School for Industrial Aid for the Blind (Indianapolis).

Payments for public welfare, general relief etc., were as follows for the year ending June 30, 1941: old-age assistance, $14,604,196.70; aid to dependent children $5,927,820.75; blind assistance $591,601; general relief $6,672,186; WPA $25,374,231; unemployment compensation $6,717,499.

The total population of Indiana's four correctional institutions on June 30, 1941, was 5,718; of its two training schools, 723. Expenditures on the six institutions for the year ended June 30, 1941, were $1,758,455.69.

Communication.—There were on June 30, 1941, approximately 10,155 mi. of roads in the state highway system and 70,113 mi. of county roads. Expenditures by the highway commission during the fiscal year ending June 30, 1941, totalled $28,069,431. The average mileage of steam railroads operated in Indiana in 1940 was 7,250. On June 30, 1941, there were 46 airports recognized by the U.S. department of commerce.

The Indiana Bell Telephone company on Dec. 18, 1941, reported 285,870 telephones in use (not including telephones of the Illinois company in northwestern Indiana, nor those of the Ohio company in southeastern Indiana). Independent companies on Dec. 30, 1940, reported 265,826 telephones.

Banking and Finance.—On June 30, 1941, there were 382 state and 124 national banks in Indiana. The total capital of state banks was $59,517,849; deposits amounted to $504,974,209; the national banks had a total capital of $51,840,441 and deposits of $592,845,963.

The 186 state-chartered building and loan associations had assets of $86,282,894 as of Dec. 31, 1940; the 69 federal savings and loan associations had assets of $97,394,000.

Total receipts of the state treasury during the year July 1, 1940–June 30, 1941, were $147,043,855; disbursements were $143,175,941. The state, as such, had no debt, the constitution forbidding the incurring of indebtedness except for certain strictly limited emergencies.

Agriculture.—The total value of agricultural production in 1939 was $180,188,000; the total acreage reported was 9,845,800. Cash income from crops was $64,155,000, from livestock and livestock products $189,163,000, from government payments $20,885,000.

Table I.—*Leading Agricultural Products of Indiana, 1940 and 1939*

Crop	1940	1939	Crop	1940	1939
Corn, bu.	145,669,000	213,416,000	White potatoes, bu.	4,335,000	4,500,000
Wheat, bu.	30,147,000	27,612,000	Apples, bu.	1,225,000	2,075,000
Oats, bu.	49,950,000	25,225,000	All tame hay, tons	2,828,000	2,716,000
Soybeans (for grain), bu.	10,989,000	14,430,000	Peppermint (oil), lbs.	372,000	269,000
Rye, bu.	1,785,000	1,608,000	Tomatoes (for market), lbs.	540,000	567,000
Barley, bu.	1,450,000	903,000	Tomatoes (for manufacturing), tons	363,000	361,500

Manufacturing.—The biennial census for 1937 showed 313,342 wage earners (average for the year), $402,116,998 paid in wages, and $2,497,547,946 as the value of the products.

Table II.—*Principal Industries of Indiana, 1937*

Industry	Value of Products, 1937	Industry	Value of Products, 1937
Steel works and rolling-mill products	$356,646,436	Meat packing, wholesale	$79,885,003
Petroleum refining	190,332,763	Machine shop products	62,678,053
Motor vehicles (not including motorcycles)	188,593,660	Refrigerators, etc.	58,013,662
Motor vehicle bodies and parts	131,260,240	Glass	57,004,049
Electrical machinery, apparatus and supplies	113,230,341	Railroad cars	56,129,931
		Canning food	45,006,000

Mineral Production.—The total value of mineral production in Indiana in 1939 was $53,423,223. In the year 1940 there were 248 new oil wells and 77 gas wells completed. Total production of petroleum in 1940 was estimated at 5,290,608 barrels.

Table III.—*Principal Mineral Products of Indiana, 1939 and 1938*

Mineral	Value 1939	Value 1938
Clay	$ 5,629,014	$ 4,088,658
Coal	24,642,000	23,968,000
Petroleum	1,675,000	1,260,000
Sand and Gravel	3,388,207	2,958,473
Stone	7,460,650	6,486,996

(C. B. C.)

Indians, American. President Roosevelt, on Nov. 1, 1941, signed an order establishing a National Indian institute in the department of the interior to collaborate with the Inter-American Indian institute provided for in the convention of the First Inter-American conference on Indian affairs held at Patzcuaro, Mexico, in April 1940. This convention came into force with its ratification by a fifth nation, Ecuador, in October. Previous ratifications were by Mexico, Honduras, El Salvador and the United States. The National institute in the United States (of America) will also initiate and promote collaboration in the fields of Indian administration and a study of Indians among federal, state and private agencies, in the U.S. and abroad. John Collier was appointed director.

The economic rehabilitation of a group of 300 Catawba Indians remaining in York county, S.C., was being jointly undertaken by the state and federal governments. The Farm Security administration was furnishing agricultural loans and expert guidance. The Indian service was advising and assisting in the fields of health, education and craft revival. There will be no reservation, and the Catawba Indians will become neither federal nor state wards, but will be voting and tax-paying citizens of the state. While a relatively minor group, the handling of the Catawba problem may indicate a new relationship between the government and Indian tribes not already under wardship.

Folk Arts.—Early in 1941, the folk arts of the American Indian received high recognition in a special showing at the Museum of Modern Art in New York city, where North American Indian arts over a span of more than 10,000 years were given an unusually handsome display. In June, The Museum of the Plains Indian was opened at Browning, Mont., on the Blackfeet reservation, as a continuing display of Plains Indian history and culture and a centre for the commercial distribution of modern Plains Indian crafts.

Selective Service.—Representatives of the Six Nations in New York state and the Yakima in Washington state appeared in court to protest the drafting of their young men for military service. They argued that it violated their status as members of independent nations who had never accepted United States citizenship. As both groups have always furnished volunteers in large numbers to the armed forces of the United States, this was not an objection to military service with the United States. The court rejected their contentions, ruling that congress had already determined that all Indians born in the United States are citizens.

Walapai Suit.—The suit of the Walapai Indians to enjoin the Santa Fe railroad from interfering with the possession and occupancy of lands in northwestern Arizona, claimed by the railroad under a land grant from the federal government, on the ground that these lands were subject to the Indians' right of aboriginal occupancy, was decided by the supreme court on Dec. 8, 1941. The supreme court held:

1. That the aboriginal occupancy rights of Indians to lands formerly under Spanish dominion are protected in the same way as Indian lands in other areas, even against those holding title to public lands.
2. That the existence of aboriginal occupancy rights does not depend upon formal recognition by the government.
3. That forcible removal of Indians from their ancestral homes does not terminate their possessory rights in lands which the tribal group has occupied from time immemorial.

The suit in question related to the lands both within the reservation and to those formerly occupied by the Indians outside the reservation. The court held that the Walapai tribe was entitled to an accounting by the railroad respecting the lands on the reservation which can be proved to have been occupied by the Indians from time immemorial. The court held, however, that in accepting its present reservation the tribe voluntarily agreed to the extinguishment of its aboriginal tribal rights elsewhere. This decision may be of great significance as establishing policy relat-

ing to Indian land titles in areas formerly under Spanish sovereignty. (W. W. B.)

Indo-China, French: *see* CHINESE-JAPANESE WAR; FRANCE; FRENCH COLONIAL EMPIRE; JAPAN; THAILAND; WORLD WAR II.

Industrial Hygiene. Speeding up of industry threw new responsibility on physicians in 1941. The Division of Medical Sciences in the National Research council; the industrial medicine committee of the health and medical committee of the Office of Defense, Health and Welfare; the Office of Scientific Research and Development in the Office of Emergency Management were especially concerned with these problems. The Council on Industrial Health of the American Medical association also co-operated, as did special organizations of industrial physicians.

Personnel.—A questionnaire circulated by the American Medical association showed some 10,000 doctors in the United States giving special attention to industrial medicine. About 1,500 were giving full time to industrial medicine. In Great Britain, regulation demanded that every industry employing more than 300 men have full-time industrial medical service. Smaller plants may use part-time services.

Industrial Dermatoses.—Especially prominent are the inflammations of the skin associated with the use of various chemicals in industry. Coal-tar derivatives head the list, but there are skin disturbances associated with flour, lily bulbs, acids, alkalies and hundreds of other substances. A special division of the National Institute of Health in the United States Public Health service led in studies in 1941. Use of gloves, protective ointments and other sanitary arrangements help to minimize the hazards. (*See* also DERMATOLOGY.)

War Industries.—Special attention to hours of work, speed-up, fatigue and accidents are particularly problems of industries associated with war. Studies of 1941 indicated that rest is more important in overcoming fatigue than is doping with benzedrine, or taking large amounts of mixtures of vitamins.

Aviation medicine was the basis of many studies related particularly to lack of oxygen in high altitudes with the appearance of air bubbles in the circulating blood. Also important was the development of clothing to keep aviators warm at high altitudes.

Fliers and drivers of tanks were reported in 1941 to be suffering increasingly from slipped disc or extrusion of the nucleus pulposus in the spine. This produces constant pain and represents pinching of the soft cartilages between the bones of the spine.

Special problems were created by the increasing employment of women in industry associated with the war effort. Absenteeism among women workers is invariably greater than among men doing similar work.

Studies continued on silicosis (*q.v.*), inflammations of eyes of arc welders, blood degenerations associated with work among benzene derivatives. The nutrition of the workers, housing and recreation were given continuous consideration.

Voluntary hospitalization insurance during 1941 covered almost 12,000,000 workers. The government considered expansion of the social security act to provide compensation to cover hospitalization costs for disability sustained in industry. (*See* also MEDICINE.) (M. FI.)

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Industrial Production: *see* BUSINESS REVIEW.

Industrial Research. The industrial research of the United States is contrived to contribute to national welfare. And in all this work the progress was great, especially from the standpoint of equipment and supplies dependent upon metals, rubber, synthetic resins, textile fibres, foods, chemicals and petroleum. In the major branches of manufacture there was intense activity; in some fields there was the necessity for secrecy. The total expenditure for basic production research in the United States in 1941 was about $275,000,000.

The widening of the scope of Air Hygiene foundation at Mellon institute led to its new name, Industrial Hygiene foundation. The budget for industrial hygiene in the National Institute of Health is close to $500,000. In general the U.S. was well prepared to cope with health problems in war industries. The U.S. bureau of mines reported on low-grade coal utilization, alunite resources, limestone and dolomite, gypsum, Iceland spar and optical fluorite, froth flotation and agglomerate tabling of micas, treatment of Alabama graphite ores, and concentration of low-grade manganese ores. TVA was experimenting with clay as a source of alumina; similar investigation was being conducted at Columbia university. Research was going forward on the use of vermiculite for lightweight concrete. The national bureau of standards reported research on action of frost on bricks, cause and correction of leaky masonry walls, and moisture-condensation in building walls. Several companies were making spark plugs by using ceramic cores containing no mica. The production of glazed porcelain cooking ware was under study. By a new procedure the components of a vitric batch were precipitated together. Ammonia, electrolytically introduced into soda glasses, was easily removable, leaving a product of higher silica content. There was announced an optical glass made of tantalum, tungsten and lanthanum, possessing greater light-bending power than ordinary glass. Glass fibre was being applied in the hull insulation of battleships, in insulating oil tanks in bombers, and in sound-deadening in plant construction.

The national bureau of standards released the findings of exhaustive tests to determine the corrosion behaviour of metals in soils. Powder metallurgical processes lent themselves well to the production of alloys. New methods of ferrous dephosphorization were being applied; external desulphurization of pig iron attracted attention. A possible substitute for steel to resist deformation at 1,100° F. was iron containing molybdenum or columbium. Continuous casting of steel increased; open-hearth operation was better controlled than formerly. A process for making light armour plate speedily enabled the carrying out of three heats in 24 hours; the carburizing treatment was accomplished with a liquid salt bath in an electric furnace. A $2,000,000 research program resulted in the development of Hipersil, an improved magnetic material for transformer cores. Molybdenum was substituted in part for tungsten. Straight chromium steels have a tendency toward temper embrittlement that can be eliminated by addition of molybdenum. Bismuth in small amount benefits the machinability of stainless steel. High-frequency induction heating was said to be satisfactory for localized surface hardening of crankshafts and a wide variety of machine parts. Research was intensified on the application of phosphoric acid or phosphate treatment to rolled steel strip for use in cans to evolve a process to make the employment of tin unnecessary. To combat static electricity, copper powder was being put in flooring cements and rubber belting. A number of companies sought new industrial uses for silver. Some of their suggestions: substituting silver for copper in electrical contacts and using silver with magnesium for lightweight alloys. The National Academy of Sciences proposed that silver be put to work for tin in solder. Work progressed on aluminum welding processes. It was predicted aluminum might later be used extensively

in photographic and motion-picture films. The automobile industry planned to jump into the employment of aluminum in a big way after the emergency terminated. Innumerable explosive rivets of anodized aluminum alloy were used in aircraft construction. Heat applied to the rivet head by an electric gun detonates the explosive in a cavity at the end of the shank, expanding the latter and forming a blind head in setting the rivet. Sea water was used as the source of magnesium in plants in Louisiana and Texas. Several new processes for producing magnesium were described.

The completion of many waste-treatment plants indicated the general progress toward cleaner streams and less health hazards; tendencies were toward more mechanization and broader use of physical methods. By-product utilization was taken up aggressively. The reactions of metal oxides with sodium chloride, sulphur dioxide, air and steam were suggested as possible outlets for large quantities of sulphur dioxide that may be recovered from waste gases. Fog over aerodromes could be dispersed with sulphur chloride solutions. Companies near San Francisco produced from sea water magnesium oxide for fertilizers. Many unusual phosphorus compounds were ready for application. Zinc oxide was proposed as a heat-insulating material. Many organic reactions that, by older methods, required high temperatures or pressures were carried through at ordinary temperatures and pressures by electrolysis. There was being studied the effect of metallic halides on the reaction of Grignard reagents and organic molecules containing functional groups. A procedure was developed for condensing alkyl carbonates with organic esters by metal alcoholates for the convenient production of malonic esters. The use of a third component to improve the fractional distillation of binary liquid mixtures attracted interest. Resinous products derived from substituted silicon compounds were described. Synthetic glycerol brought a number of intermediates from the process formerly obtainable in quantity only from glycerol itself. Many amines were finding uses in the production of dyestuffs. Sixteen new propionates of sugars were synthesized. Synthesis of phenol by a method involving the partial-pressure evaporation of water of reaction as formed was said to offer advantages over customary processes.

A division of chemotherapy was at work in the National Institute of Health. Solutions of sulphanilamide and related sulpha drugs appeared to act like colchicine in speeding up evolutionary changes in plants; colchicine was used in producing apparently similar changes in animals. The text of the 12th revision of the *United States Pharmacopoeia* was expected to become official about Aug. 1, 1942. To a greater extent than ever before pharmacopoeial recognition was being given to organic synthetics in the field of medicine.

Photosynthesis was further elucidated by tracer studies; some phases of the process may be independent of light. All four regional laboratories of the U.S. department of agriculture were occupied; more than 400 persons were at work in them. Disease-resistant vegetables for the home garden were described. More than one-fourth of the nitrogen used in mixed fertilizers is supplied by ammonia liquors. Waste sulphite liquor was shown to confer sulphur to soils lacking in that element. The use of chemical fertilizers dissolved in water as a starter solution and for liquid side-dressing of vegetable crops was the subject of much research. Fertilizers in the form of pellets and cubes were said to have advantages. Rooting of numerous varieties of citrus cuttings was favoured by immersing them in 0.02% heteroauxin or 3-indole-acetic acid solution; this chemical also increased cotton yields. 3-indole-butyric acid was being employed as a growth promoter by pecan husbandmen. A process of hulling cotton-seed by steam explosion was under development. Cotton insulation for dwellings was considered a promising use. Insulating board was made experimentally from cotton burrs and stalks and gypsum. Cotton Research foundation fostered at Mellon institute investigations on cotton plant constituents and on properties of cotton fibres. Two new varieties of soybeans were being studied by the New Jersey experiment station. Researches in refining soybean oil and in using it in combination with other oils increased its consumption. The introduction of wet toasting following extraction, to increase the palatability of soybean meal, helped to abate the prejudice against the use of the solvent-processed product in feeds.

Improvements were made in infant feeding and the nourishment of 20,000,000 school children. With less than 2,000,000 babies born a year, infant-food manufacturers expanded their markets with lines of products for older children. The next step might be foods especially for the middle-aged and aged, an advance that might be nurtured by the growth of interest in geriatrics. Fresh results of nutritional research suggested better types of rations to prevent avitaminoses and to promote efficiency of fighting personnel. Emergency need for concentrated foodstuffs was speeding research by the U.S. department of agriculture on the dehydration of vegetables, and the program might be extended to include other foods. Progress in the dehydration of foods was likely to effect marked improvements in quality as well as vitamin contents of such products. A frozen-food research laboratory was completed by the federal government at Albany, Calif. About 50 industrial research laboratories were engaged in vitamin studies. Increases in the vitamin contents of certain useful plants were to be expected from genetic studies. It was estimated that $300,000 went into the production of the first gram of vitamin B_1 by synthesis. Efforts were being made to process vegetables in whole form and to conserve colour and flavour. The flash process was adapted for use on tomato juice. Trends in milling technology continued toward improvement of the baking quality and nutritive value of cereal products. The production of enriched bread included the use of thiaminized flour or yeast, of vitamins and suitable iron salts for direct addition to the dough, and combinations of these procedures. A company began the production of flour by a process utilizing flotation to retain more minerals, proteins and vitamin B_1. Sugar was finding new industrial applications, such as in the preparation of chemicals, and in various other ways—for example, in steel-products technology to prevent splashed metal from solidifying on the walls of moulds during pouring. A larger yield of flavour was secured from spices by an explosion process. In studies by the U.S. department of agriculture, specialists found wide differences in the protection afforded by various types of paperboard packages and the linings and wrappings used with them. The addition of urea to the basal ration of cows definitely increased milk production. Of late years research has made cheese manufacturing less erratic, but it is still an art that sometimes breaks down. At Cornell there was evolved a low-cost process for smoking poultry, available for general use. An "ice box in reverse" that ages hams in 10 to 12 weeks, instead of the year or more required by the old-time farm method, was developed. The army quartermaster corps found beneficial the gelatin coating of meats.

By examining gases removed from samples of soils, to detect hydrocarbons present, it was possible to locate underground deposits of oil and gas. The practicability of recovering methane from coal *in situ* before mining was studied. Studies in the correlation of crude oils with geological environment yielded a method for distinguishing between crudes produced from the same horizon and regarded as practically identical by true boiling-point distillation. Horizontal drilling of oil wells, after 25 years of working out the problems involved, appeared to be an accomplished technique of the petroleum industry, bringing more oil production from certain types of fields and offering promise of further extension in the future. Brine properly conditioned was effective as a flooding medium for secondary recovery of oil. Further research progress was recorded on petroleum refining by-products as potential sources of pharmaceutical intermediates. The largest volume of octane was made by the alkylation process, the second largest by iso-octane, and the third by neo-hexane. The "fluid catalyst" petroleum cracking process was said to permit more continuous cracking and lower costs than intermittent cracking using solid catalysts. Compounds such as di-isopropyl formal blended with aviation fuels were claimed to aid vaporization in high altitudes. Improved protective coating for interiors of aviation fuel drums were devised. Lubricating oils of superior load-carrying capacity and decreased tendency toward oxidation and carbon formation were made by incorporating small amounts of the dialkyl esters of phthalic acid. Novel oils, creations of organic chemistry, were watch and precision-instrument lubricants. In diesel fuels a problem is to improve ignition quality, a property measured by its cetane number; certain addition agents, such as organic polysulphides, raised this number. A process for the fractional fusion of waxes was announced.

A process sped up the ageing of hardwood by injecting synthetic resin into green wood, at the same time removing the sap and moisture. The chemicals that demonstrated most promise in the seasoning of wood were urea, invert sugar and a mixture of them. To help aircraft builders the U.S. department of agriculture sought better inspection methods for the selection of wood. With the development of improved plywood resulting from the use of plastics, especially phenolic and urea resins, the growth in specialty applications, such as furniture, housing, radios, shipbuilding and aircraft, was large. A continuous process for the hydrolysis of wood with dilute acid was developed, resulting in the production of lignin and lignocellulose for plastics, as well as acetic and formic acids, furfural and wood sugars. The use of crude lignin powder for the removal of iron from water showed likely results. Lignin paste appeared satisfactory for bonding floor coverings. There was an increasing tendency to study from the point of view of chemical kinetics the reactions involved in wood pulping. A penetration and acid-recovery process for sulphite mills employed the principle of interconnected digesters which form a closed system. In pulping conifers a small but definite amount of sodium sulphide was necessary to obtain optimum pulp properties. Another substitute for salt cake consisted of gypsum and soda ash.

Electrically heated flying suits were perfected. Research on acroplane seats and cushions was in progress. Cotton had in 1941 over 1,000 known applications. The Cotton Board of Manchester, Eng., was assisting in arrangements with the National Association of Hosiery Manufacturers and other groups to make available the experience of British cotton spinners in producing hosiery of fine-gauge lisle yarns. Resist cotton yarns, called "immunized," were intended to produce decorative effects in fabrics. In new-use investigation excellent progress was made by the Cotton Research foundation toward the objective to effect, by inexpensive means, a marked increase in the drape qualities of cotton fabrics. Increased wear performance of fabrics was attained through selected weaving conditions. Special fabrics were developed for accomplishing better adhesion where employed in making laminated materials. Investigations were being conducted on the production and use of worsted-type yarns from rayon staple fibre and rayon blended with wool and other fibres. Bromination might have value in shrink-proofing wool. There was announced a further 25% expansion of the nylon yarn capacity. Considerable developmental work was in progress on applications of vinyon. Vinyon net came into use for women's shoe uppers; vinyon gloves were also introduced to American women. Vinyon felts were utilized by the shoe and luggage trade as liners and plumpers; they were also employed as filtering media in air-conditioning

and cleaning units and as anti-abrasive elements on the bottoms of lamps and table and desk ornaments. The use of toxic mercurial compounds in fur-carroting operations was largely eliminated from the hat industry. The Bealmac process became prominent in nonmercurial carroting. It was reported that 1,000,000 lb. of casein fibre would be in felt hats during the year. The array of American dyes included approximately 2,000 trade colours; the production in 1941 was valued at nearly $110,000,000 or about 45% more than in 1940. Cationic finishing agents and their effects on direct dyestuffs continued to receive research. Vinylite copolymer, high molecular weight resins were applied extensively in cloth coatings. Light coatings on fabrics were developed for shower curtains; heavier coatings found their way into raincoats and other waterproof apparel. Combined with cloth, vinylite sheeting, which is scuff-resistant, was utilized in children's shoes.

Exhaustive tests conducted by the national bureau of standards brought out that dwelling houses are kept cooler in summer if the exteriors are treated with white or light-coloured paints. The bureau of standards studied the behaviour of the special paints used on exterior walls of porous masonry to keep out moisture. Tung oil might be replaced by oiticica oil from Brazil, dehydrated castor oil, glycerides of fractionally distilled fat acids (from fish oil) and segregated oils (natural oils from which the non-drying constituents have been partly removed). Because of its low cost and similarity to tung oil, oiticica oil should be used increasingly by the paint industry in coming years. Zinc rather than lead driers should be employed with oiticica oil. The Flax institute endeavoured to produce a seed that would afford linseed oil of higher iodine value. The U.S. department of agriculture separated soybean oil into two fractions, one having much higher oil-drying power than the other. There was reported the limited commercial production of the pentaerythritol ester of fractionated soybean fatty acids, said to be superior to linseed oil in colour retention and drying speed. Special aircraft paints included a dull black hard to find with searchlights, a bright aluminum paint for sunny days and a paint for hiding planes on hazy days. The American Gum Importers association was sustaining research on natural resins. Congo and Manila resins possessed possibilities through esterification. Cyclic ketones, derivatives of isophorone of high molecular weight, were being used as plasticizers for coatings. Coatings of vinylite on steel replaced corrosion-resistant metals for many purposes, such as in refrigerator trays and washing-machine parts.

The United States and Mexican departments of agriculture concluded an agreement for rubber-producing experiments in Mexico. The governments of the United States and Haiti announced agreement on a program whose central feature was a plan of rubber development. The rubber-plantation industry in the western hemisphere was on the way to progress. Rubber processing might profit by utilizing methods of injection moulding developed by the plastics industry. Pellet rubber was said to facilitate mixing. A product that practically prevents cracking of tread and sidewall rubber was developed. Plioform was being utilized in fuel tanks of aeroplanes and combat vehicles; pliofilm gas-decontamination suits and baby parachutes for naval aircraft flares were available. The first of a series of full-scale Raolin chlorinated rubber manufacturing units was placed in operation. Up to 1941, 29 varieties of synthetic rubber had been studied. Current synthetic production of general purpose rubber was equivalent to about 3% of the crude rubber consumption; the output in 1942 should be at least 15% of normal requirements. In 1941 the automobile and aircraft industries used well over 100 different neoprene parts. In its resistance to ageing, ameripol was described as superior to natural rubber; its resistance to acids and alkalies is about the same. Ameripol sponge was in production.

More than 125,000 tons of plastics for moulding purposes were produced in the United States in 1941. At least 13 types of plastics were on the market. To cite some examples of plastics in war work, shock-resistant compounds found outlets in instrument cases for aircraft, fuse timers, electrical fittings and gun stocks; laminated and plywood products were of high importance to construction methods both in aeroplanes and in the new motor torpedo boats. The trend in the use of plastics has been toward industrial applications rather than for ornamental purposes. For instance, comprehensive researches led to the development of new synthetic resin exchange adsorbents and a purifying agent in the sugar industry consisted of an active resin deposited upon a diatomaceous base. Extruded plastics were available in more than 60 shapes. Commercial articles manufactured by injection-moulding machines varied from a tiny doll's eye to windows for the housing of roadside gasoline pumps. A method for thermosetting resins, known as transfer moulding, was extending the design of pieces made from phenolic and urea moulding powders.

Cellulose nitrate, the old timer of thermoplastics, found important usage in the automotive industry. Hammers with heads of pyralin cellulose nitrate were employed extensively. Tenite cellulose acetate was seen in window shades on buses, in tops of syrup pitchers, in fishnet floats, in the casings of leash reels, in tool and revolver handles, in oil cups and in graduates and funnels in laboratories. Extruded mouldings of tenite were being made in a variety of shapes, sizes and colours. Ocarinas, radio dials, lenses and knobs, "juke box" coverings and piano music racks were applications of plastacele. Bakelite had more than 15,000 patented uses. The production of cast phenolic resins approached 6,000,000 lb.; the principal applications included phonograph decorations, jewellery and dress ornaments, brush backs and radio cabinets. Continuous tubes and shapes were supplied in lustron polystyrene. The position of elastomeric compounds in the field of plastics became increasingly important. Umbrellas, watch chains and cosmetic, shoe, garment and laundry bags were being made of vinyl elastomers. Vinylite compounds in tape form were developed for providing electrical and protective insulation on many types of circuits. Koroseal was available in monostrands and also in film and tubing. Polyvinyl alcohol was well known in the form of flexible refrigerant hose. A glare-eliminating screen for automobiles, claimed to be 99.99% efficient, used polyvinyl alcohol, stretched, then treated with iodine. Saran fabric, woven like cloth, was under development as an upholstery material. A foamed urea plastic appeared to be an insulator for heat and sound. Both hot- and cold-setting plaskon glues were in use in aeroplane construction. A new method was announced for applying resin surfaces to dense materials such as laminates.

The acrylic gun turret was an improvement over the "blisters" formerly used on bombers; the acrylic navigator's hatch was also another development. A transparent, shatter-proof acrylic plastic was utilized in planes for windows, noses, tail empennages and landing light covers. A transparent plexiglas pump for handling dilute acids, hypochlorites and other chemicals was being marketed. A conveyor apron made of lucite methyl methacrylate resin rods was an innovation on textile-conditioning machines. The capacity for the manufacture of transparent lucite sheeting was doubled. Seventy applications on 14 models of 1942 automobiles attested to the use of lucite in this field; two 1942 models each had 11 parts of lucite.

Canada.—The staff of the National Research council's laboratories at Ottawa had been almost doubled since 1939. The funds at the disposal of the council for 1941 were some fivefold greater than for the last prewar year. In addition, other projects involved about twice or three times as much again and a trust fund provided by the industries of well over $1,000,000 was available if needed. Research Enterprises, Ltd., was a wholly owned government corporation established by the ministry of supply to produce for the armed forces and for the industries devices developed by the council. Aeronautical laboratories were constructed; about 1,000 laboratories were being maintained by industrial establishments; close to 225 laboratories were in operation in universities. A wartime bureau of technical personnel in the department of labour recruited competent persons for scientific work in the war industries. War minerals were being sought widely, and numerous discoveries were made. Twenty-five plants were making heavy chemicals and the production of synthetic ammonia was started in the first of three new factories. Aviation gasoline of octane value 80–87 came from the crude oil of Turner valley; a plan was under consideration to produce motor fuels from a combination of ordinary gasoline and wheat-derived alcohol. Improvement in the flavour quality of Wiltshire bacon resulted from the adoption of better handling and curing practices. The Fisheries Research board issued a comprehensive bulletin on the chemistry and technology of marine animal oils.

Brazil.—The government, considering the country's great mineral resources and the need for the development of heavy industries, established the National Council of Mines and Metallurgy. The production of sulphur from pyrite and the potassium salts and about 20 other chemicals was being studied. The Instituto de Pesquizas Tecnologicas was in charge of the treatment of lead and silver ores. The production of medicinal preparations was increased. A national pine institute was operating. A study of technical methods used in processing vegetal materials was undertaken for Brazil by the U.S. department of agriculture. Brazil had about 20 varieties of vegetable oils. A division on rubber was formed in the Instituto Naçional de Tecnologia. Rubber plantations were receiving favourable reports from the experimental stations. Brazil would be an important source of natural caffein if the plastic caffelite were manufactured on a large scale, as contemplated.

Great Britain.—Scientific research in Britain's war effort had three main pillars: the Department of Scientific and Industrial Research, the Medical Research council and the Agricultural Research council. Some 20 fields were given associative investigation under the auspices of the department. Two research associations had annual expenditures of £100,000. An Engineering Advisory committee was appointed to assist in solving engineering problems connected with the war. The British Standards institution issued emergency specifications to meet conditions from restrictions in the supply of materials and also advice on fire-detection devices for combating incendiary bombs. The Gas Research board was formed. The chemical industry continued to meet essential requirements, but a number of important materials must be imported, including pyrite, phosphates and potash. A Chemical Control board was engaged in co-ordinating the work of the various raw material controls. The proposal was made that coal seams of low range be exploited by underground gasification, as in the U.S.S.R. Research was published on the constitution of alloys of aluminum with magnesium and silicon. A method of magnesium recovery was based on the use of a high-frequency induction furnace and a solid reducing agent, such as ferrosilicon or calcium carbide. The Chemical society introduced a scheme to facilitate the supply of fine chemicals. The Imperial institute published a survey of wartime drug supplies and empire production. To hasten the application of promising research results to farming practice was the task set the Agricultural Improvement council. Ammonium bicarbonate was a wartime alternative to ammonium sulphate as a fertilizer. Research was undertaken on the effect of low temperatures in preventing damage to wheat stored with high moisture content. The ministry of food advocated the use of sodium bicarbonate for cooking fruit to reduce sugar consumption. The cheese-making industry was to be cultivated by the application of rheological methods. Chloral hydrate was found to be useful in restoring documents "knocked out" by fire. A synthetic tannin was obtained by fusing phenol with alkali and sulphur. Mercerizing of cotton was claimed to be improved by replacing caustic alkali with silicate of soda. Rayolanda X was obtained by introducing a synthetic resin into the viscose spinning mass. The dyeing and processing of blackout curtains continued to win attention. Rubber armour was found to protect persons exposed to air raids by taking up and dispersing the pressure wave. Isobutylene highly polymerized resembles natural crepe rubber, but deteriorates less on ageing. It was expected the supplemental development of synthetic rubber would have a stimulating effect on the processing of natural rubber. British plywood manufacturers set up a division for the production of major components and stressed parts of aeroplanes. Wood impregnated with plastic material was used for the construction of aeroplane stamping dies. In aircraft, plastics were employed for under-carriage, hydraulic ram and pump, and power-operated gun-turret bearings. In World War II, camouflagists became aware of the importance of the principles of countershading and dazzle.

Netherlands.—The Cuma water-treating system consisted of weak solutions of silver produced by electricity. Sulphur dioxide was used to control rinder scab of cattle. All yeasts investigated at Amsterdam were found to contain free aneurin.

France.—It was urged that automotive producer gas be made from coal concentrated by flotation so as to ensure the highest quality motor fuel of this type. Early in the year papers appeared on the basic Martin process

and on the properties and uses of rare-earth metals and their compounds. Researches were published on the synthesis of diacetone alcohol, on the ethers and esters of glycol and glycolic aldehyde, on the condensation of phenylacetic and phenylformylacetic esters, and on the nitration of cellulose. France was making plans for cellulose manufacture from straw.

Italy.—A method of coating small objects by copper carbonyl was described. Research was active in the production of pure zinc and zinc alloys. Although Italy possesses considerable bauxite the country conducted extensive experiments on the employment of leucite as an aluminum raw material. The utilization of alunite also was considered. Experiments were carried out with coal gas as a fuel for aeroplanes. The cultivation of the castor plant was encouraged; castor oil was under trial in aeroplane lubricants. An experimental station conducted research toward utilizing native essential oil plants.

Switzerland.—The leading task of the War Industries and Labor office was to safeguard the raw materials supply and industrial production. The number of persons employed in the chemical industry nearly trebled since 1890. The Society of Chemical Industry in Basle attributed its success under war conditions to a policy of decentralization. The first of three new staple-fibre plants began operation. At Geneva the molecular weight and constitution of caoutchouc were studied. Research reports were published on amidon, steroids, vitamin F and the enzymatic oxidation of carotin.

Hungary.—Bentonitelike clays were used for laundering and in the place of cutting oils in the metal-working industry. Safflower oil was available for producing soaps, varnishes and margarine. Condensation products of aromatic amines and aliphatic aldehydes were used in making resin preparations. Investigation demonstrated that keratin could be transformed into various coloured azo dyes.

Germany.—Since 1938 the reich succeeded in trebling synthetic oil output; this product costs two to three times as much as natural petroleum. An improved motor fuel was obtained by heating benzene in an autoclave to 225° C. under a pressure of 20–25 atmospheres for several hours. More than 1,000,000 cu.m. of wood was distributed for motor fuel during 1941. A research institute was formed to work out improvements in safety glass and glass fibre manufacturing processes. The properties of cerium-treated cast iron were studied. Many steel alloys were developed especially for castings. Manganese steels were substituted for chromium-molybdenum aeroplane structural steels. Inkromizing was effected by the chrom-diffusion of steel with chromic chloride. If plans were carried out, aluminum eventually would largely replace tin in the production of containers. Increasing employment of magnesium alloys in machine parts, railway and automotive vehicles, and aircraft made strength a vital problem. It was known that large quantities of war gases were ready. New techniques would enable gas attacks on a wider scale than any seen in World War I; for instance, fleets of aeroplanes equipped with chemical tanks could spray large areas with vesicant liquids. That gas attack was regarded as possible at any time was evidenced by the fact that all the belligerent nations had equipped their armies with masks. A new establishment was concerned with vitamin testing and research. Research was reported to have been successful in improving tobacco types. Mineral acids served to preserve green fodder if a neutral protective agent were interlayered. An institute was founded to furnish information on various woods. Wooden "hardware" for doors, windows and furniture appeared on the market. Scientists were at work to achieve satisfactory substitutes for cork. The preparation of cellulose from corn stalks was said to be much easier than from wood sources. Potato tops were being pressed into briquettes for use by paper factories. Research was conducted on the use of flax and hemp wastes for making staple rayon, the manufacture of cellulose from lignite, the use of chestnut wood, willow bark, hops and bean stalks as cellulose raw material, the preparation of keratin from wool dust, human hair and natural silk waste, the making of textile fibres from tendons and horse meat, and the production of fishskin leather. The cost of producing synthetic rubber was about 40 cents per lb. Hard Buna was claimed equal to hard rubber products in chemical and mechanical durability and superior in heat resistance. Uses of plastics in aviation were made in laminated bullet-resisting windshields, transparent cockpit covers and instrument panels. Alkyd resins were being more and more used in the painting of iron. It was found that an aluminum-silicon alloy occasionally substitutes for lead pigments. Zinc ferrite was the rust-proofing ingredient of a new paint. Iron was rust-inhibited by paint containing carbon and ammonia.

Denmark.—The formation of metal ammines was investigated fundamentally. Substitutes for imported oilseeds were sought. The pharmaceutical industry was specializing in biological preparations.

Norway.—Labradorite was found utilizable for producing aluminum. Norway was said to be in a position to produce annually around 100,000 tons of cellulose fodder. A factory for the manufacture of pressed fish had a process claimed to preserve the product for 10 years regardless of climatic conditions.

Sweden.—A cement and concrete research institute was established. New types of alloyed constructional steel having either very little or no nickel content were developed. Experiments were made to extract vanadium and also alumina and potash from spent oil shale. A plant was planned for the production of alumina from andalusite. Experiments revealed improved methods of producing pine tar. Domestic apatite was serving as a substitute for phosphate rock. Whey was being converted into a substitute for molasses in cattle feed and confectionery. The Swedish State Research Insitute for Freshwater Fisheries investigated catch methods and the prevention of stream pollution and piscatorial diseases.

Finland.—Water-gas production, with wood or peat as fuel, was discussed as a source of power which would also permit the domestic manufacture of methyl compounds. The large-scale manufacture of sugar from wood was undertaken.

U.S.S.R.—The application of low temperatures in industrial research was important. A new process of making liquid air was developed. A compound of xenon with phenol was announced and it was said that krypton acted similarly. Research was done on semiconductors, rectifiers and photoelectric cells. The Academy of Sciences decided to construct a powerful cyclotron at a cost of 1,500,000 roubles. Lead cyanamide was investigated as a pigment. Pegmatites were utilized for high-voltage porcelain. Attempts to use high-frequency installations for drying various ceramic products were successful. Experiments were made with a fuelless locomotive, charged with steam from a stationary boiler. The absorption of sulphur dioxide from smoke by means of magnesia was held practical for large power stations near contact sulphuric acid plants. Small amounts of alkali were added to the flushing fluid in drilling for petroleum to lower the hardness of rocks. The complete utilization of larch was outlined. Phthalic esters of cellulose were studied. A new fabric consisted of 50% wool and 50% fibre made from lupin-seed albumin. Several experiment stations were at work in endeavouring to improve the silk industry. Passing a direct current through the soil helped the formation of water-resistant aggregates. Ammonium alginate served as the starting material in research on the production of plastic masses.

Union of South Africa.—The government voted £5,000,000 to be used for the promotion of new industries and expansion of existing manufactures, particularly coke and steel. The Minerals Research laboratory conducted experiments on making chromates, bichromates and chromic acid from domestic chrome ore. The government studied the use of charcoal as a motor fuel. A company experimented successfully with the fermentation of molasses by a special yeast under alkaline conditions. The dehydration of citrus fruit was under study and Transvaal farmers considered the commercial production of avocado oil.

India.—Investigations recommended for adoption by the board of scientific and industrial research included manufacture of electro-acoustical and high-frequency apparatus, X-ray transformers, refrigerating machinery, photographic plates and photosensitizing dyestuffs, industrial preparation of essential oils and of ionone from lemon grass, production of thyroxin, extraction of sulphur from pyrite and the manufacture of optical glass. Projects completed by the board related to the manufacture of laminated paper products, resin-impregnated wood, dry cells, glass substitutes and stoving enamel. Steps were taken to assist nascent and undeveloped industries through the Test house at Alipore.

Netherlands Indies.—New uses were sought for molasses. A report was issued on the utility of latex as a protection against glass splinters during bombing raids. Mealorub, a partially vulcanized rubber in granular form, was possibly of importance for blending with bitumens. Experimental work on cinchona was fostered.

Australia.—The Commonwealth Council for Scientific and Industrial Research made a thorough exploration of domestic potash resources. It was decided to manufacture aluminum from domestic bauxite. An Aeronautical Research committee was formed; the suggestion was made to transfer to Australia a considerable part of the aircraft manufacturing of the United Kingdom. Progress was recorded in the introduction of producer gas as an engine fuel, particularly with farm tractors. Phellandrene from eucalyptus was effective as an antiknock; the addition of eucalyptus oil to motor fuel increased power and mileage. Extensive research was carried out on the preservation of fish and on the cold storage of smoked fish and eggs.

New Zealand.—Plans were completed for the production of silico-superphosphate containing serpentine. By an electromagnetic method a 90–95% glauconite was produced from greensand. Research was conducted on the processing of bentonite. The activation of charcoals was studied.

Japan.—It was proposed to vaporize alcohol and gasoline in separate carburetors and to inject the vapours, in proper proportions to each other and air, separately into combustion chambers; acetylene gas and gasoline could be used similarly. Aluminum was being produced from alunite but costs were high; processes using clay were not commercially successful. A chemical warfare department was set up. Employment in the chemical industry had increased 18% since 1937. In Formosa it was said a hemp substitute had been prepared from banana skins. Soybean protein dissolved in 49.5% urea solution was reported to be more stable than in caustic soda—a fact thought to deserve consideration for manufacturing soybean fibre. A fish yarn, a wool substitute under research, was prepared from whale or shark meat protein hardened with formaldehyde. The Japanese ministry of agriculture and forestry claimed success in cultivating a variety of seaweed used for agar-agar with a growing time of 40 days, compared with the usual 2-year period. (*See* also CHEMISTRY; CELLULOSE PRODUCTS; CHEMISTRY AND ENGINEERING, AGRICULTURAL, U.S. BUREAU OF; CHEMURGY; PLASTICS INDUSTRY.)

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Infantile Paralysis.

As yet unsolved among the important facts about infantile paralysis by Jan. 1, 1942, were the exact character of the virus that transmits the disease, the symptoms by which it can be diagnosed with certainty, laboratory and skin tests which will permit diagnosis earlier than is now possible and a specific method of inoculation that will prevent the disease.

The Virus.—The virus was isolated in the material from human beings, and animals injected with it developed the disease, but there was much about its characteristics that needed to be known. Unquestionably the virus gets into the body by way of the bowel and passes along the nerve, eventually reaching the spinal column which it attacks, particularly the anterior horn cells of the spinal column. The virus is regularly excreted from the human being by way of waste material from the bowel.

In a study of an epidemic in Western Springs, Dr. E. A. Piszczek and his associates in the laboratory of the Illinois state department of health found a boy who did not have infantile

paralysis—at least the symptoms were not recognized—but who excreted the virus regularly from his bowel over a period of several months. The father of the boy became infected and died. For a good many months after the boy was first exposed to infantile paralysis he still continued to give off from his bowel material containing the virus, and this virus was capable of giving infantile paralysis to a monkey when inoculated into the body of the monkey.

Transmission.—The current belief was, therefore, that infantile paralysis is spread as is typhoid with excretions from the bowel which contaminate the hands, the food, drinking water and other materials taken into the body. Furthermore, flies and other insects which may feed on excretions from the human being can carry infantile paralysis, as has been shown by investigators in various laboratories.

Prevention.—Chiefly important in preventing infantile paralysis are the following procedures: (1) Avoid having children come in contact with new groups of people; (2) see that children take nothing into their mouths that could have been soiled by discharges from the bodies of others; (3) little is gained if a community closes the schools and swimming places and allows the children to mingle with people on the street, in stores and other meeting places; (4) all suspected cases of infantile paralysis should be promptly reported to the local health officer; (5) on the appearance of the very first suspicious symptoms of the disease a physician should be called.

Respirators.—There was a widespread use of respirators or "iron lungs" to aid weakened muscles of the chest when they were unable to function. In 1941 more than 700 respirators were distributed throughout the United States. The National Foundation for Infantile Paralysis, 120 Broadway, New York city, prepared a pamphlet in which the location of each respirator was indicated. Evidence accumulated by Dr. J. L. Wilson of Detroit showed that in the majority of cases the iron lung is used too late to be of maximum value. Only 52% of patients with infantile paralysis were placed in the respirator on the fourth day of the disease or earlier. Those placed in the respirator earlier had a far greater chance of recovery than those who waited as late as the seventh day of the disease.

Sister Kenny Treatment.—Perhaps the most sensible advance in the control of infantile paralysis was the contribution of Sister Elizabeth Kenny who studied infantile paralysis first while she was nursing in the Australian bush country. In Australia all nurses are called Sister in addition to those of the Catholic orders. Attempts to keep the muscles in the best possible condition during the time the nerves are incapacitated so that the muscles can resume their function when the progress of the disease stops and the nerves begin functioning, promise the greatest possible recovery.

During Sister Kenny's treatment of the muscles, splints, braces and frames are removed from the patient. Hot, moist packs are applied to the muscles to relieve pain. A warm bath, followed by ice sprays, or alternate hot and cold baths, will aid to stimulate the circulation of the blood. At the same time the muscles are trained to continue their function. Fingers, feet, hands, legs and arms are moved to the limit of possible motion or until pain begins. The patient is encouraged to concentrate on the portions which are being moved by the nurse and thus by concentration to stimulate motion through the incapacitated nerve by the mental stimulus as far as possible. Such periods of muscle training are carried out twice daily but also with extreme care to prevent the patient from overdoing and exhausting either muscles or nerves.

In the study of the technique developed by Sister Kenny, the National Foundation for Infantile Paralysis again was most helpful in granting funds to the University of Minnesota, under whose auspices her work was conducted and observed, and at the same time donating funds to physiologists working in various laboratories who studied the nature of the actions of the muscles in order to determine the scientific basis for this form of treatment.

Thus Dr. D. Y. Solandt of Toronto came to the belief that a change in point of view is necessary regarding the function of the muscles. He, too, was convinced along with Sister Kenny that long immobilization with casts and splints may not be most desirable in many forms of infantile paralysis. Moreover, the orthopaedic surgeons in the University of Iowa found that braces, even though properly applied, were unable to prevent deformity in paralyzed limbs and they were agreed that good, if not better, results were obtained by physical treatment to the muscles and joints.

The Armstrong Discovery.—At the meeting of the American Public Health association which was held in Atlantic City in Oct. 1941, a medal was awarded to Dr. Charles Armstrong of the United States public health service for some of his fundamental discoveries with the virus of infantile paralysis. Dr. Armstrong found that the eastern cotton rat could be infected with the virus of this disease, and thus made possible intensive research. Heretofore only the monkey had been the experimental animal which could be adapted to such studies.

Much of the funds of the National Foundation for Infantile Paralysis was devoted to the purchase of monkeys to aid in the intensive research. It seemed likely that the conditions of World War II would prevent importation of monkeys and thus put a stop to all research. In this emergency the discovery of Dr. Armstrong was of the utmost value. However, a shipload of monkeys did arrive in the United States late in October, and the work continued. (M. Fl.)

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Infant Mortality. According to final reports, there were 110,984 deaths of infants under one year of age (exclusive of stillbirths) during 1940 in the United States and 2,360,399 births, so that the infant mortality rate was 47 per 1,000 live births. This rate is the lowest on record for the United States. However, provisional reports for the first six months of 1941 received from 39 states show an infant mortality rate of 49.8 per 1,000 live births, somewhat higher than the figure of 49.4 per 1,000 for the corresponding period of 1940 in the same states.

Canada reported 13,754 infant deaths in 1940, with an infant mortality rate of 56 per 1,000 live births; whereas the preceding year, 1939, showed a rate of 61 per 1,000. In England and Wales, there were 33,638 deaths of children under one year of age in 1940, and the infant mortality rate was 55 per 1,000 live births. This marked an increase of 10% over the figure for 1939, when the rate was 50 per 1,000. Provisional reports through Aug. of 1941 compared with the corresponding period of 1940 indicated that there would likely be a further increase in infant mortality in England and Wales in 1941.

The appended table shows infant mortality rates for the principal English-speaking countries since 1921. Throughout this period, New Zealand consistently maintained the record for lowest infant mortality, with Australia as next best. The general decline in the infant mortality rate after 1920 was attributed to improvements in the control of diseases peculiar to infants to increased attention to the problems of nutrition, and to advances in sanitation. But the adverse effect of disrupted homes and of starvation caused by the war was and would be felt in all the countries of Europe, particularly in the occupied areas. A statement from the unoccupied area of France reported a significant rise in infant mortality. The regression of infant mortality in England and Wales has already been described.

Annual Infant Deaths per 1,000 Live Births in the Principal English-speaking Countries, from 1921 to 1940

Year	United States	Canada	England and Wales	Scotland	Northern Ireland	Eire	Australia	New Zealand*	Union of South Africa (whites)
1921	76	102	83	90	87	73	66	48	77
1922	76	101	77	101	77	69	53	42	73
1923	77	103	69	79	76	66	61	44	74
1924	71	93	75	98	85	72	57	40	74
1925	72	92	75	91	86	68	53	40	68
1926	73	102	70	83	85	74	54	40	65
1927	65	94	70	89	78	71	54	39	71
1928	69	90	65	86	78	68	53	36	70
1929	68	92	74	87	86	70	51	34	64
1930	65	89	60	83	68	68	47	34	67
1931	62	85	66	82	73	69	42	32	63
1932	58	73	65	86	83	72	41	31	69
1933	58	73	64	81	80	65	40	32	61
1934	60	72	59	78	70	63	44	32	61
1935	56	71	57	77	86	68	40	32	63
1936	57	66	59	82	77	74	41	31	59
1937	54	76	58	80	77	73	38	31	57
1938	51	63	53	70	75	67	38	36	52
1939	48	61	50	69	70	65	38	31	50
1940	47	56	55	78	86	..	..	30	..

*Europeans excluding Maoris.

Infant mortality in the United States is highest in the south and southwest. The states having the highest infant mortality rates, according to reports for 1940, are New Mexico (99.6), Arizona (84.3), South Carolina (68.1), Texas (68.6) and Louisiana (64.2). The first two of these states contain a large proportion of Mexican population among whom infant mortality is very high, while the last three states have large Negro populations, also with high infant mortality. In addition, Texas has a large Mexican population. The states with the lowest records in 1940 are Minnesota (33.3), Oregon (32.9), Connecticut (34.1), Illinois (35.3), and New Jersey (35.6).

The extent of the variation in infant mortality according to race is provided by data for 1940. In that year, the white population had an infant mortality rate of 43.2 per 1,000 live births, and the Negroes had a rate of 72.9 per 1,000, while among other coloured races the figure was 91.0 per 1,000.

When births and infant deaths are allocated according to place of residence instead of place of occurrence, it is found, on the basis of data for 1939 (the latest available in this respect), that conditions on the whole are best in cities of 10,000 or more, poorest in cities of 2,500 to 10,000, while rural areas fall between these extremes. Thus, in the white population, those in cities of 10,000 or more had an infant mortality rate of 41.1 per 1,000 live births, while the corresponding figures for cities of 2,500 to 10,000 and for rural areas were 50.1 per 1,000 and 46.1 per 1,000 respectively.

A recent survey of infant mortality according to cause of death and subdivisions of age within the first year of life, based on United States

data for white babies in 1937–38, showed that almost two-thirds of the deaths occurring in the first day of life were ascribed to premature birth and about one-sixth to injury at birth. Congenital malformations and congenital debility were also important. In contrast, in the last quarter of the first year of life, about one-quarter of the deaths were from diarrhoea and enteritis, about one-third from influenza and pneumonia, and about one-ninth from the common communicable diseases of childhood. Thus, during the infant's first year of life, the hazards from infectious disease are of increasing relative importance.

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(A. J. Lo.)

Infantry: *see* ARMIES OF THE WORLD; MUNITIONS OF WAR; WORLD WAR II.

Influenza: *see* EPIDEMICS AND PUBLIC HEALTH CONTROL.

Ingersoll, Royal Eason

(1883–), U.S. naval officer, was born June 20 in Washington, D.C., the son of Rear Adm. Royal Rodney Ingersoll. He was appointed to the Naval academy from Indiana, 1901, and after graduation was assigned to several U.S. warships. He was on duty at the Naval academy, 1911–13, when he received orders to join the Asiatic fleet. He went to the office of naval operations in 1916, and during World War I received the navy cross for his services in organizing, developing and directing the communications office of the navy department. After the war he was an executive officer and commander of battleships and cruisers. Pres. Roosevelt in 1938 nominated him rear admiral, jumping him over the heads of a dozen senior officers. On Dec. 20, 1941, Secretary of Navy Knox appointed him commander of the Atlantic fleet to succeed Adm. Ernest J. King (*q.v.*), who was designated commander-in-chief of the U.S. fleet. Ingersoll's appointment followed a shake-up in army, navy and air commands after Secretary Knox toured Hawaii and found U.S. defense forces there "were not on the alert" during the Japanese attack on Pearl Harbor Dec. 7, 1941.

Initiative and Referendum.

Initiative and referendum are used less in odd years because general elections are fewer. Nevertheless a considerable number of questions and measures were submitted in 1941.

Federal.—Under supervision of the agricultural department, marketing control quotas proposed by it were voted as follows: *cotton* (1940), 848,428 to 70,429; (1941, Dec. 13), 743,844 to 48,613; *peanuts*, 64,462 to 9,388; *tobacco* (burley), 111,045 to 29,523; (dark cured), 8,910 to 1,423; (fire cured), 20,109 to 2,697; *wheat*, 453,569 to 106,061. This vote by the wheat growers in 37 states marked the first test of federal marketing control of a major crop chiefly produced outside the south. Reference to dairymen of the department's proposed amendments to New York Milk Order 27 was enjoined by Justice Bailey of the District of Columbia supreme court at the instance of the Dairymen's league, on the ground that the secretary of agriculture had acted "in an arbitrary and capricious manner in attempting to coerce plaintiffs," etc. Under supervision of the Indian office, *referenda* on tribal constitutions resulted as follows: Kiakegee, Okla., 39 to 17; Saxman, Alaska, 31 to 1; Klukwan (Chilkat village), Alaska, 34 to 4. On charters, the vote in the two latter places, respectively, was 32 to 0 and 35 to 3; in Big Valley, Calif., 17 to 0; Shivwitz, Utah, 34 to 2; Goshute, Utah, 33 to 0; Port Gamble, Wash., 36 to 0.

State.—*Georgia* voted on 70 proposed constitutional amendments, most of which authorized specific local units to issue refunding bonds or make other fiscal adjustments, and were adopted as was an amendment extending to four years the terms of "governor and other constitutional officers" (50,110 to 30,190), thus providing such a term in one-half of the states. A proposal for annual legislative sessions was rejected (28,519 to 28,238).

Illinois.—In Rockford, where the schools, facing a deficit, were ordered closed Nov. 7, 1941 to Jan. 5, 1942, an increase of the educational tax rate of 50 cents per $100 on the assessed valuation, voted (8,820 to 3,989) on Dec. 16, insured a continuous school session of 9½ months.

New York voters, on the other hand, rejected (880,684 to 588,694) a proposal to extend the terms of state senators to four years; but adopted amendments authorizing appropriations and bonds for highway improvement (936,279 to 629,313); constitutional changes without an attorney general's opinion (776,385 to 558,638); "ski trails" on certain slopes of Whiteface mountain (740,506 to 730,562).

New York City.—The long sought, but persistently frustrated, abolition of useless county officers in greater New York was at last voted by the electors on Nov. 4 (509,284 to 228,019). It substitutes for similar officers in each of the five counties a single sheriff and single registrar to be appointed by the mayor from a list of three certified by the civil service commission, under which also the office employees are to be selected.

A separate proposal for retaining incumbents not under civil service was rejected (379,617 to 306,454), as was also another (390,397 to 316,159) making the city-wide sheriff an elective officer.

Westchester County.—A proposed amendment of the county charter, substituting a county board of 11 members for the present 44, was rejected (57,398 to 41,342), although the county is said to have "6,500 employees and annual operating costs of $77,000,000," which might be considerably reduced by "a smaller and more responsible board, divorced from town politics and not so amenable to log-rolling."

Peekskill rejected proposals to: (1) increase the tax levy to pay maturing bonds (964 to 396); (2) seek permission to refund said bonds (784 to 427); (3) issue new bonds for fire apparatus (726 to 486).

White Plains voted (4,836 to 2,371) against approving an ordinance fixing the mayor's salary at $5,000.

Wyoming County.—Castile voted (1,895 to 1,223) continuance of prohibition of intoxicating liquor sale.

Oklahoma, whose state debt had mounted in ten years to $32,000,000, adopted on March 11 amendments (1) prohibiting legislative appropriations exceeding an official estimate of the average state income for the three previous years, without the levy of new taxes to meet the excess (163,886 to 85,752); (2) removing the limit on appropriations for "relief and care of aged or needy" (193,170 to 59,838); (3) co-ordinating all state-supported institutions of higher learning (including others conditionally) into a "state system" under a board of regents with terms of nine years each, appointed by the governor and confirmed by the state senate (152,173 to 95,617).

Washington.—On March 11 Spokane voters, for the second time within five months, rejected (26,609 to 17,279) a proposed ordinance authorizing the city commission to purchase and distribute, through acquisition either of the existing Washington Power company plant or a new and competing one, retail power from the Grand Coulee dam.

Rumania.—Premier Gen. Antonescu's dictated plebiscite on March 12, to "express approval or disapproval" of his regime brought 2,490,944 in favour and 2,816 against. All Rumanian Jews (estimated at 750,000) were barred and radical Iron Guard elements had been purged and others cowed. Not content with this "vindication," he ordered another for Nov. 3, preparatory to making Rumania "a corporative state" within the "new order." Result 3,446,689 to 68. Such gestures are of course only "pseudo-plebiscites."

St. Pierre and Miquelon.—On Christmas day, 1941, the day after Free French forces had seized the islands, a plebiscite of the male population was held, in which 650 voted for Free France and 10 for Vichy France; 100 votes were voided.

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Inland Waterways: *see* CANALS AND INLAND WATERWAYS.

Inner Mongolia: *see* MONGOLIA.

Insects: *see* ENTOMOLOGY.

Installment Selling: *see* CONSUMER CREDIT.

Institute of Pacific Relations: *see* PACIFIC RELATIONS, INSTITUTE OF.

Insulin: *see* MEDICINE.

Insurance, Accident and Health.

Accident, health and hospitalization insurance had another successful year in 1941, with premium income increasing 12% to a new high level of more than $316,000,000.

Hospitalization coverage continued popular. It was fairly well recognized that such protection is underwritten more satisfactorily on a group basis. Some companies writing on an individual basis insisted that hospitalization policyholders carry loss of time coverage as well. The importance of hospitalization coverage in relation to loss of time protection had been overemphasized, U.S. government survey figures showing that only one out of ten cases of disability attended by physicians was hospitalized.

Although practically all accident and health policies contained clauses excluding claims from "war or acts of war" for the last 25 years, the new type of warfare involving civilians introduced the need for a new definition of "act of war." Companies were generally agreed that they would pay claims for accidents suffered during blackouts but that bombing attacks obviously would be considered an "act of war." However, several companies announced that they would pay claims for injuries to civilians during air raids, thus creating a disturbing competitive situation. Opponents to such an extension of coverage held that it was more important that a company protect its solvency by war clause restrictions rather than risk impairment in claim-paying ability. A number of companies reduced their age limits on accident coverage from 14 to 16 down to 5 to 6. (C. D. SP.)

Great Britain.—The outstanding feature of the accident business of British offices during 1941 was a reduction in the premium income, amounting in the aggregate to about 25% of the pre-war figures. Results published during the year, relating to the business of 1940, improved on previous years and most companies earned excellent profits.

Personal accident insurance contracted as a result of financial stringency, but some new business was done in war risks covers. Workmen's compensation insurance increased because of the expansion of industry due to the war effort. Premiums in this section were adjusted to a 65% claims ratio and the profit was small. No alterations were made in the Workmen's Compensation act, since the Royal commission appointed to consider the subject suspended its labours for the time being. In third party insurance a house of lords decision dealt with the question of damages for loss of expectation of life and should reduce the high figures which had previously been awarded under this heading.

Insurance against loss of or damage to property, such as burglary and plate glass, was affected by difficulties in replacement of property. Aviation insurance was of growing importance but was largely transacted by specialist offices. (*See* also INSURANCE, AUTOMOBILE: *Great Britain;* LAW.) (C. E. G.)

Insurance, Automobile.

Automobile casualty loss ratios hit an all-time high in 1941 in the United States. The companies showed a sizable underwriting loss for the year's operation on a volume of business slightly larger than that written during 1940. The greatly increased frequency of accidents, due to increased use of automobiles, and rising claim settlement values contributed substantially to this underwriting loss. Rate levels remained approximately the same as during 1940.

The standard automobile policy underwent a further revision through the removal of restrictions relating to carrying passengers for a charge and the age limitation of the driver.

Rate levels and loss ratios for fire and theft remained substantially unchanged, while the volume of such business moved upward. Collision rates, however, were increased as a result of higher loss ratios, the same factors contributing to this increase as were mentioned in connection with the casualty lines. The same changes were made in the fire, theft and collision policy forms as were made in the casualty forms.

The revised New York Financial Responsibility law was the most important automobile insurance legislation of the year. Its emphasis is on compelling the motorist to purchase insurance. The ultimate effect of the law should be approximately the same as the compulsory law in effect in Massachusetts. The lead taken by New York in insurance legislation is usually followed by many other states, and it seemed therefore probable that the future would see similar laws adopted in other states with a resultant increase in automobile premium volume. (G. E. Ho.)

Great Britain.—Owing to wartime restrictions the volume of motor insurance contracted sharply in 1940 and the tendency was more pronounced in 1941, though exact figures were not available in the closing months of the year. The reduction was mainly in the private car section, as so many cars were laid up and insurance was required against fire and theft only. The claims experience was less favourable, for road accidents showed a steady increase month by month as compared with former years. This appears not to have been due solely to blackout conditions, though those played some part in the depreciated experience. Damage claims were delayed by difficulties in obtaining spare parts. It was unlikely that motor insurance as a whole would show much profit when the year's results were ascertained but rates had not yet been increased.

Certain special types of policy were found necessary for vehicles used by local authorities, air-raid precaution organizations and the like in public duties. (C. E. G.)

Insurance, Fire.

The business of fire insurance on the whole did fairly well in 1941 in the United States. To be sure, there was an increase in the amount of the losses to be paid, but there also was an increase in the volume of premiums, so that by and large the general results were fairly satisfactory. The untoward conditions were those which probably affected most businesses; namely, a decrease in the returns on the invested funds and an inevitable increase in expenses. Fire insurance, however, has one great advantage over many businesses in that its product, so to speak, is sold over an enormously wide territory and the skilled underwriter learns to spread his liabilities so that an undue loss may not occur at any one point. This comfortable condition may be jarred by an unusual loss and during 1941 there was one at Fall River, Mass., caused by the partial destruction of the large rubber plant and stocks on Oct. 12. The loss was estimated at $15,000,000, but as it had not been fully adjusted before the close of the year 1941, the net loss figure was not available. However, the figures given sometime after the fire did not seem to be any less than those first reported. This one loss, taken as reported, was sufficient to account for the increase in the fire loss over the year 1940.

In 1938, it was predicted that there would be normally a steady increase in the losses in the following years; that prophecy was being fulfilled.

One outstanding feature which would affect fire insurance and cause a re-examination of past practices was the form known as use and occupancy insurance. This protects the owner against the losses and carrying expenses which he incurs and is subject to the interval from the time his plant ceases to operate and until it is restored. In times when material to rebuild and material to reoperate are normally available in the markets this is a safe line of insurance to underwrite, but under conditions of World War II, when the priorities might make it impossible either to get material to rebuild the plant or to operate it if rebuilt, this form of insurance took on a new aspect and one which had to be re-examined. (*See* also FIRES AND FIRE LOSSES.)

(E. R. H.)

Insurance, Life.

While the federal government of the United States furnishes a limited amount of protection for dependents under the widows' and orphans' benefits of the Social Security act and for members of the armed services under the War Risk and National Service Life Insurance, the legal reserve life insurance companies of the United States and Canada continued to provide most of the life insurance protection available to the people of North America. At the end of 1941, the total life insurance in force in these companies was estimated at more than $130,000,000,000 (excluding reinsurance) or a gain of 5% over 1940. The new business issued during the year amounted to more than $13,000,000,000, which was 10% more than issued in 1940. The assets of the companies at the end of 1941 amounted to almost $35,000,000,000, after paying or crediting to policyholders and beneficiaries about $2,800,000,000 during 1941.

The mortality experienced in the United States and Canada during 1941 continued favourable. The continued decline in pneumonia mortality despite a widespread influenza epidemic early in the year, offered convincing proof of the value of chemotherapy in the treatment of this disease. The downward trend of the tuberculosis death rate was also maintained. The principal unfavourable features of the year's mortality were the sharp increases in the death rates from automobile and industrial accidents, the latter being in large measure due to the increased industrial activity in 1941.

Life insurance companies continued to experience difficulties in finding an adequate volume of appropriate and remunerative investments for their new funds. The extent of life insurance companies' participation in the financing of national defense was indicated by the fact that their portfolio of United States and Canadian government securities increased by about $800,000,000 during 1941. However, the yields on both government and corporate high grade bonds reached new all-time-record lows during 1941 and there appeared to be little prospect of any material improvement in the interest rate. Reflecting to a marked degree the low yield obtainable on suitable new investments, the interest rate earned during 1941 on the aggregate of life insurance company assets continued on the downward trend characteristic of

recent years. Because of the continued low level of interest rates and because of the requirement by New York state that industrial policies written on and after Jan. 1, 1942 be valued on modern industrial mortality tables, several large mutual companies writing both ordinary and industrial insurance announced changes in the legal reserve bases for life insurance to be issued in 1942. The reserves of these companies on new business will be determined on the basis of interest rates lower than 3% and on more modern mortality tables. This was the first time in the history of American life insurance that interest rates lower than 3% would be used for life insurance reserves. Because the effect of the low interest rates greatly overshadowed the recent improvement in mortality, higher premium rates would be charged by these companies for new insurance. While the changes in premium rates charged did not, of course, affect policies issued in the past, the low level of interest rates responsible for the changes already was reflected in decreased dividends on participating policies issued in the past and probably would continue to be so reflected in the future.

Prior to the entry of the United States into the war, only a very small proportion of life insurance policies in force on citizens of the United States contained any limitations of the life insurance benefits or required the payment of extra premiums in the event of war service. However, after the entry of the United States into the war, a number of companies announced that war clauses would be incorporated in all policies to be issued. While the companies would absorb the war risk on practically all of their existing policyholders, the safety of the insurance of the general body of policyholders demanded that companies take the necessary precautionary measures in respect of new insurance. The extra hazard of war was a risk which to a limited extent was assumed by the government through National Service Life Insurance. (*See* also LAW; SAVINGS BANKS, MUTUAL.)

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Insurance, Marine.

The surprise attack by the Japanese on Pearl Harbor and other United States possessions in the Pacific on Dec. 7, 1941, followed by the action of congress in declaring a state of war existed between the United States and Japan, Germany and Italy, was the culmination of the surprising events which happened throughout the year 1941, causing marine underwriters to make swift changes in their quotations to meet changing conditions.

Following Italy's entrance into the war against France, President Roosevelt extended the "combat zone" so that U.S. ships were prohibited from trading with Great Britain, Ireland, the entire continent of Europe including the Mediterranean sea and the north coast of Africa. Portugal and part of the Spanish Atlantic coast were excepted. As a result, the regular U.S. service maintained to Lisbon was the only U.S. service to Europe. Closing the Mediterranean to U.S. ships necessitated substituting Greek ships to transport tobacco from Greece and Turkey. After long negotiations with both Great Britain and Italy to secure safe conduct for a number of these ships from Greece past Gibraltar enroute to the U.S., Italy suddenly declared war on Greece and bombed Greek ports. One of the ships loaded with tobacco was bombed and sunk, the others escaped to Alexandria where new arrangements had to be made to continue to the U.S. by another route. New freight rates and insurance rates had to be negotiated and there were delays in waiting for convoys and for fuel. The ships went through the Suez canal and around the Cape of Good Hope, thus crossing the equator twice. As a result of this long voyage and the length of time the tobacco was loaded on board, in some cases for five months, the losses were very large. On every one of the seven ships that arrived in the U.S. at the beginning of 1941, the cargo had suffered damage; in all, the claims exceeded $3,500,000, which constituted the most serious marine cargo losses of 1941.

The necessity of rerouting voyages and, more serious, the diversion of many regular liners to war service, requiring the substitution of older and frequently greatly inferior ships, was a cause of anxiety to underwriters. A committee of the American Cargo Marine Reinsurance clearing house recommended rates on these outside ships and, though such rates are official only in respect to reinsurance through the clearing house, they were generally followed in the market. Due to trade being brought to a virtual standstill with the axis countries and the countries they had overrun, the volume of cargo premiums was reduced; it was further reduced by the requirements of U.S. neutrality laws to the effect that title had to pass from U.S. owners to purchasers abroad before materials could leave the United States for belligerent countries, which resulted in the insurance on such goods being placed by the purchasers in their own market.

Cargo Losses.—A matter causing underwriters much concern in 1941 was the government's taking over of the entire importation of certain strategic materials. The government had in 1941 a complete monopoly on imports of rubber, tin, tungsten, manganese and several other commodities, and was adding to the list from time to time. This meant that all regular commercial trading in these items ceased. However, the government continued to carry marine insurance on these imports and reinsurance arrangements were made so that the liabilities were well spread throughout the market. The worst single loss cargo underwriters in the U.S. ever experienced came under these policies—the fire at the plant of the Firestone Rubber & Latex company, Fall River, Mass., on Oct. 12, 1941. Loss on the rubber stored there amounted to approximately $15,000,000. As a result of this heavy loss on such a vital commodity as rubber which might be very difficult to replace under conditions existing around Malaya and the Dutch East Indies in 1941 and 1942, the government was rearranging storage plans so that the quantity subject to one loss would be materially less.

A large percentage of the marine cargo losses in 1941 arose because of war conditions but were not actually caused by war perils—these included collisions while travelling in convoy, entering and leaving ports without proper aids to navigation, congested conditions on piers at certain ports, and the necessity for utmost haste in loading and unloading.

In 1940 a surcharge was agreed upon to be added to the regular marine rates on all shipments to the United Kingdom, the continent of Europe and North Africa. Later the area was increased to include the Red sea and all the near east. Experience showed the surcharge was not sufficient to cover the losses, and with Japan and the axis countries waging declared war on the U.S., it seemed probable that the surcharge question would receive further attention and that the area of its application as well as the rate charged would be increased.

Hull Business.—Hull business in the U.S. market showed a considerable increase in premiums. Shipowners were placing a larger percentage of their business in the U.S. than formerly. In addition, hull valuations were largely increased. On many vessels the amount of insurance carried was double the amount carried in 1940. Because of this, premiums increased although rates remained fairly steady, but with repair costs on the increase it seemed probable that rates must be increased in 1942.

The most severe hull loss of the year was the stranding of the "Manhattan" near Palm Beach, Fla., on Jan. 12, 1941, while on voyage from New York to the Pacific coast via the Panama canal.

The cost of repairs alone exceeded $2,000,000 and there was a further claim for salvage services which had not been settled at the close of 1941.

War Risk.—War risk insurance continued with increasing volume. The American Cargo War Risk Reinsurance Exchange demonstrated that it could satisfactorily meet the requirements of U.S. importers and exporters. Originally there were three rates on each trade route, the lowest for cargo carried by U.S. flag ships, then somewhat higher by other neutral flags, and third, a still higher rate when carried by a belligerent flag ship. Early in 1941 in western hemisphere trade there were only two rates—United States and other neutrals, one rate, and belligerent, a higher rate. Later there was only one rate for a trade, applying to all ships. Rates remained fairly constant through the year. Rates to the near east were raised when the Germans invaded Greece, and to the far east when Japan moved into Indo-China and threatened the Dutch East Indies and Malaya. On the other hand, when the United States started an Atlantic patrol and sinkings in the North Atlantic decreased, the rates to Great Britain were reduced. Of course, after the Japanese attack on Pearl Harbor, all rates in Pacific trading were substantially increased. Hull war risk business also increased during the year 1941. Most of this was written through the American Marine insurance syndicates but a considerable volume, particularly on ships of the Latin American republics, was written throughout the market.

At the beginning of 1941 many owners operating in coastwise, intercoastal, West Indies and South American trades did not think there was any danger from war perils in the western hemisphere for U.S. flag ships and did not carry war risk insurance. However, they began to carry it from the time the "Robin Moor" was sunk in the Atlantic in May 1941. It appeared probable that in 1942 every ship in ocean trade would carry war risk insurance. As with cargo insurance after the U.S. entered the war, there was only one rate in each trade route irrespective of flag, and all rates in Pacific ocean, West Indies and South American routes were increased.

The most important war risk losses on cargo during the year 1941 were on the Greek steamer "Petalli" bombed in Piraeus harbour in April, loss principally on tobacco amounting to about $3,000,000; the Norwegian steamer "Silverplana" long overdue in New York from the Dutch East Indies, believed to have been sunk by a German raider in the Pacific, loss estimated to be approximately $2,000,000; the Dutch steamer "Kota Nopan" also on voyage to the U.S. from the Dutch East Indies, sunk by German raider, loss $1,630,000.

Losses on United States hulls were slight, largely because they were prohibited from trading in war zones, but with the Neutrality law amended to permit their trading anywhere and the country at war, U.S. ships would be used in 1942 to carry lend-lease materials to the anti-axis allies and losses would be heavier.

Inland Marine.—There were no developments of special importance in the inland marine field. There was considerable agitation to permit the issuing of the Personal Property floater in states where it was prohibited. This form was approved by Rhode Island as of Nov. 1, 1941, the first of the eastern states to approve it. As of Dec. 15, the companies writing inland marine agreed not to write war risk on shore. Ocean marine companies did not write this after 1939. Protection of private property on shore in the U.S. from war perils was to be arranged for by the government through the newly formed War Risk Insurance corporation.

(S. D. McC.)

Insurance, Old Age: *see* SOCIAL SECURITY.

Inter-American Highway: *see* ROADS AND HIGHWAYS.

Interior, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Interior Decoration.

The year 1941 was a difficult year for the designer, but stimulating to his creative ability. Because designers were necessarily called upon to use substitute materials effectively and to simplify design, much emphasis was placed on simplicity in design of all furnishings and on their practical application.

Interior Trim and Floors.—A growing preference for simple wood casings, baseboards, etc., was noticeable, and even period interiors showed a tendency toward lighter wood finishes and less use of painted trims. Various hardwood floors were used extensively, as well as prefabricated parquet flooring. The use of tile and brick floors greatly increased during 1941.

Floor Covering.—The use of rubber and cork flooring was considerably curtailed. Carpets and rugs continued to be equally popular, dependent on their suitability to the location. Plain colours still were favoured; the most popular colours for floor coverings as well as other furnishings were greens, shades of rose, blue and grayish beige tones. The demand for textured effects contributed to the development of such interesting weaves as a loosely looped construction, a shaggy and a long cut twisted texture, and various plain and multicoloured grass rugs.

Wall Treatment.—Although walls were most frequently painted or papered, such materials as grass cloth, plywood panelling and prefabricated wood veneers on wallboards and plain prefabricated wallboards were increasingly preferred for the major rooms, with linotile, specially manufactured prefinished wallboard materials, tiles and glass employed extensively in baths and kitchens.

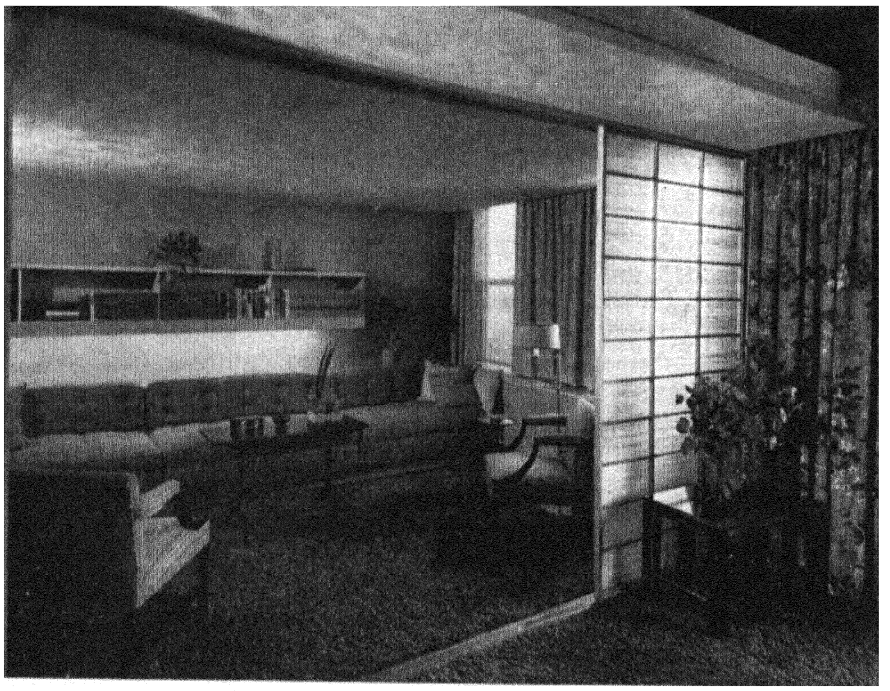
Window Treatment.—Most over-curtains were made of figured linens, printed chintzes and plain rough-textured fabrics, with the curtains to a great extent treated simply. A trend toward eliminating valances and lambrequins was evident, and all trimmings used were very simple. Window blinds, such as woodweb venetian and linen folding shades, instead of casement curtains, were coming more into the limelight.

Furniture.—Furniture finished in lighter, natural colours maintained its popularity. A new type of moulded plywood chair was introduced, and combination case goods units showed further improvement. Entire pieces of plastic furniture as well as plastic hardware in various shades were increasingly developed. Reed, bamboo and rattan furniture became more prominent for various interior rooms, and built-in pieces of furniture were frequently used in recreation and other informal rooms. (*See* also FURNITURE INDUSTRY.)

Furniture Coverings.—Plain rough-textured fabrics were still preferred for both traditional and contemporary furniture. Like floor coverings, upholstery colours remained somewhat subdued to offset the boldness of colour and design prevalent in wallpapers and draperies. In more formal settings, velvets, damasks, brocades, etc., were still predominant. Slip covers, popular for year around use, appeared in bold chintzes and printed cottons and linens.

Lamps.—Forms were simpler, straighter, taller. A Regency or American Federal revival prevailed in lamps as in other home furnishing items. For modern settings, glass, plastics and wood were adapted for bases, while natural coloured shades predominated. Shades were made of grass cloth, rough fabrics, paper—such as metallic paper in strong, bright colours, gold and silver—parchment and silk.

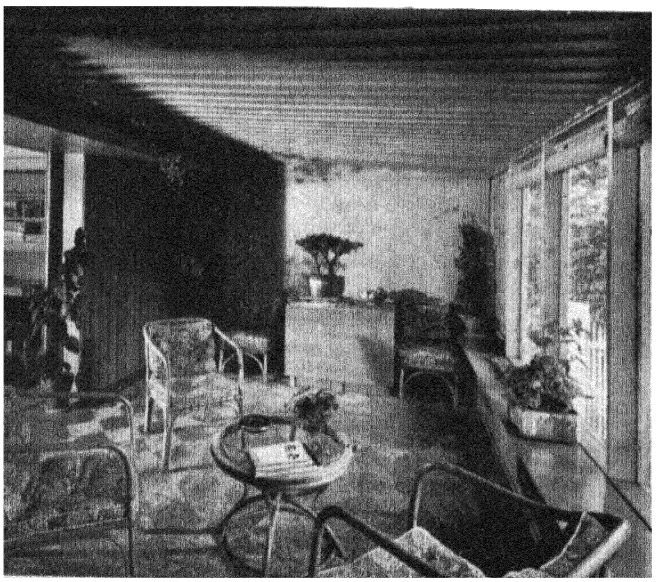
Lighting Fixtures.—More indirect lighting fixtures and fewer side brackets were present not only in contemporary rooms but also in traditional rooms. Fluorescent lighting for the home as well as for commercial use was decidedly improved. In lighting fixtures and in practically all other home furnishings plastics contributed a great deal.

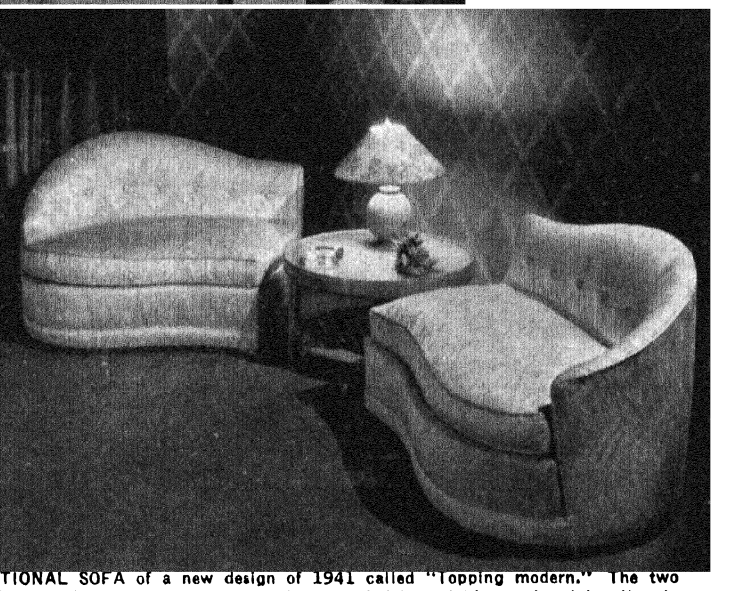


SECTION of a small sitting room with contemporary architectural background and furnishings in 18th century English style

FEDERAL FURNITURE, inspired by national emergency, returned to favour in 1941. This classical bedroom grouping of solid mahogany featured the U.S. eagle on the centre finial of the mirror, the wall sconces and the lamp base

PORCH remodelled into a lounge room, where windows are removed and replaced by screens for summer. Plants supplement the need for curtains





SECTIONAL SOFA of a new design of 1941 called "Topping modern." The two sections, equipped with casters, may be separated by a table or placed together to form a single large sofa

Accessories.—*Glassware:* Good proportions and simplicity of design were stressed more than elaborate and finely cut glassware. Coloured glass was used to a minor extent.

Dinnerware.—Informality was the trend, with an American "feeling." Colours most popular were shades of pink, yellows, blue and the so-called Regency colours.

Other Decorative Accents.—Art objects such as figurines, vases, bowls, etc., showed a decided Chinese influence. This carried out the current trend for combining Chinese design with modern.

Plant Life.—Owing to the decided trend toward simplification of home furnishings and the use of few curtains, various types of plants were extensively used, often taking the place of draperies when placed about a window. Graceful, exotic plants enhanced the Chinese feeling which prevailed in accessories. (G. M. J.)

International Labour Conference: *see* INTERNATIONAL LABOUR ORGANIZATION.

International Labour Organization.

When the sturdy little group of I.L.O. experts and their assistants recovered from the shock of the storm that drove them from Geneva to the new working centre in Montreal, Canada, they took a leaf from the militarists who caused their plight. They consolidated and reorganized their forces and started a new offensive in the quest of social justice.

Substantial contributions were made to the maintenance of the democratic way of life and new values found for the three-way system of representation and discussion of fundamental tasks of governments, management and labour in countries at war or at peace; there was promise of greater contributions to the foundations on which a reconstructed world could be built and postwar difficulties minimized and successfully managed.

The wise and skilful leadership of John G. Winant ceased when he was called to the post of U.S. Ambassador to Great Britain. Edward J. Phelan —an Irishman and a highly trained British civil servant, who had helped in the creation of the I.L.O. in 1919—was the first official appointed by the first director. This man, who had rendered longer distinguished service than any other, became acting director Feb. 16, and later was confirmed with all the powers of director.

With a budget of 4,000,000 Swiss francs, about half that of 1940, the office in 1941 maintained services to member states not greatly different in their immediate utility from those previously rendered.

Studies and reports on timely topics included: *I.L.O. and Reconstruction* (112 pp.), *Organization for Seamen's Welfare in Great Britain, Building Social Security, Latin America and the International Labor Standards. The International Labor Review* appeared monthly in English, French and Spanish. The *Legislative Series* continued publication of the text of laws and regulations from all parts of the world regarding labour questions. *Industrial Safety Survey*, supplements to *Occupation and Health, I.L.O. Year-Book, Year-Book of Labor Statistics,* appeared or were expected to appear soon. *The Labour Situation in Great Britain* (56 pp.), *Labor Supply and National Defense* (245 pp.), and *Wartime Developments in Government-Employer-Worker Collaboration* (152 pp.) were important publications; still more, the *International Labor Code,* 1939 (920 pp.), a classified, annotated edition of the obligations and standards of all I.L.O. conventions, prepared by C. W. Jenks, legal adviser of the office.

No new conventions had been adopted since 1939, but ratifications of old ones were registered—23 after the outbreak of World War II—bringing the total to 882. The implementation of ratifications, technical tripartite conferences, advisory services to governments, employer- and employee-organizations of member states, preparation for war and postwar problems gave Montreal plenty to do. Better contacts with rapidly increasing industrialization under war pressure in the western hemisphere meant new opportunities and added responsibilities.

International Labour Conference.—The Extraordinary (1941) International Labour conference of the International Labour organization, held at New York, N.Y., and Washington, D.C., Oct. 27–Nov. 6, set a high-water mark in I.L.O. history. All 25 previous constitutional conferences for treaty-making and legislative purposes—except the first in Washington, D.C., 1919, and the second, a maritime (special seamen's) conference, in Genoa, Italy—met at Geneva. Regional and tripartite technical conferences were held elsewhere in the U.S.A. and the western hemisphere.

The New York conference met at Columbia university and held its closing session, on the invitation of President Roosevelt, at the White House. Pres. Nicholas Murray Butler of Columbia university called it "the most important international gathering . . . in several years." Thirty-four nations, I.L.O. members, were represented and one former member sent an observer. Twenty-two had tripartite delegations representing workers, employers and governments, which last included 17 members of cabinets and ministries.

Since the fateful world situation made the adoption of long-term instruments such as conventions and recommendations inappropriate, this conference did not meet to adopt conventions but to confer on the role of the I.L.O. in winning the war to preserve the democratic way of life and social security. It was remarkable for the unanimity of opinion and determination expressed in the debates on two questions on the agenda: the report of the acting director on "The I.L.O. and Reconstruction" and "Methods of Collaboration between Public Authorities, Workers' Organizations and Employers' Organizations."

The gist of the resolutions unanimously adopted was: (1) The social objectives of the Atlantic charter, enthusiastically endorsed, must be implemented by measures which the technical experience and facilities of the I.L.O., with its representation of labour and management, well fits it to pledge. The governing body was requested to bring to the attention of governments the desirability of associating the I.L.O. with the planning and application of measures of reconstruction; to ask that it be represented in all peace or reconstruction conferences, and that governments not having such agencies set up representative agencies for the study of the social and economic needs of the postwar world to consult with appropriate organs of the I.L.O.; and that the governing body, from its own membership, set up a tripartite committee to study and prepare measures of reconstruction, and emergency measures to deal with unemployment, in co-operation with governmental, intergovernmental and private agencies. (2) Economic and social objectives must be harnessed for effective teamwork, and steps taken to expand at once, within the framework of the present constitution, the economic functions and competency of the I.L.O., with further enlargement in view in postwar arrangements. (3) Economic and social measures to secure prosperity and social justice in the textile industry and in the mercantile marine. (4) Effective collaboration in wartime and postwar reconstruction requires the full collaboration of public authorities, employers', and workers' organizations, "within the framework of democratic political institutions." (5) Full technical aid and co-operation of the I.L.O. is promised regional, national and local public agencies, in response to requests, to Latin-American, Asiatic and central European and Balkan countries. (*See* also CHILD LABOUR; LEAGUE OF NATIONS; REFUGEES.) (S. McC. L.)

International Law.

The most notable event of the year for the United States was actual entrance into World War II. Neutrality was not strictly observed for the two years preceding that event, and that had given rise to considerable legal difficulties. The destroyer deal with Great Britain, the so-called lend-lease acts, the amendment of the neutrality act, the freezing orders on the funds of nations and nationals seized by Germany, the assistance given to China—all looked toward eventual entry into war. This was called non-belligerency, but that status was not recognized in international law. It apparently had been used to justify departures from neutrality while hoping to escape belligerency. The term had been used in another sense by several of the Latin-American countries which regarded the United States as a "nonbelligerent," in order to accord preferences to American naval vessels in the South American harbours of countries not at war. The Central American countries, with the exception of Mexico, declared war on Germany, Italy and Japan. Neutrality was becoming more difficult. The neutral state was in much the position prevailing in the 15th and 16th centuries when neutrals had to align themselves with one or the other belligerent and risk much on the correctness and eventual success of their preference. Neutrality was designed to avoid the necessity for such a choice.

Arbitration.—Even during the war year of 1941 some successful arbitrations were agreed upon or concluded. The Trail Smelter case between Canada and the United States was settled by an award of March 11, 1941, fixing liabilities for the escape of fumes from the Canadian smelters which injured farms in the state of Washington. On Nov. 19, 1941, Mexico and the United States agreed on a valuation, for purposes of compensation, of the oil properties expropriated by Mexico March 18, 1938. It was understood that the subsoil rights were to be valued together with the surface properties. The payments were to be stretched over a period of seven years from 1942. The agreement covered also a settlement of the general claims against Mexico since 1868, on which awards in many cases had already been made. By instalments Mexico would pay $40,000,000 on this account. The revolutionary claims were settled by awards and annual payments were being made under the agreement. The Ecuador-Peru boundary dispute, pending intermittently for more than a century, was about to be settled on the basis of the status quo of 1936. Ecuador had claimed three large provinces of northern Peru but apparently relinquished this broad claim. Chile and Argentina agreed to entrust to an American citizen the arbitration of their respective claims to Antarctic lands. Bolivia, subject to government ratification, agreed to purchase the properties of the American-owned oil company whose concession it purported to cancel by executive decree in 1937.

Legal Issues.—The "Robin Moor," an American ship with considerable contraband for South Africa, was torpedoed in the South Atlantic by a German submarine before the 1941 change in the neutrality act. Although the passengers fortunately were ultimately rescued, the United States made claim on Germany for alleged illegal sinking, a claim which Germany rejected. The repeal of the neutrality act sections 2, 3 and 6 made it possible to arm American ships and to send them into war zones or anywhere else. By arming they voluntarily assumed the risks of attack without warning and subjected to the same risk American unarmed ships, since the sub-

marine is unable to make a distinction between the two.

Even before the outbreak of official war with Germany and Italy Dec. 11, some German and Italian consulates, such as the German in San Francisco and the Italian in Newark and Detroit, were closed by request of the United States government, which was privileged to withdraw exequaturs when the consuls became *persona non grata*. The ground alleged was the use of these consulates as propaganda agencies. A protest was made to Sweden in June for permitting the passage of German troops from Norway to Finland. In March the 1817 treaty ban on the construction of warships in the Great Lakes was lifted by agreement with Great Britain.

The U.S. policy toward private property even before December 10 presaged the approaching belligerency. The first blacklist was published July 19, containing the names of firms in Latin America with which citizens of that country were forbidden to do business. Many hundreds of names were on this list, which was amplified from time to time. In individual cases names were also deleted. The "freezing" of assets of all foreigners domiciled in countries of Europe occupied by Germany was undertaken in 1941 as a measure of conservation of the assets and a means of preventing them from being disposed of by German agents or by others for the benefit of the German occupant. Licences helped to relieve the hardships created by this freezing, which gave rise to a number of cases mentioned below. The private property of certain foreigners was also forfeited or requisitioned on a considerable scale before Dec. 11. The main item consisted of Italian and German ships which had sought refuge in U.S. harbours. In numerous cases the Italian ships had been sabotaged, whereupon under United States laws the seamen were prosecuted and the ship declared forfeited. Italy protested on the ground that the ship was free to injure itself if it did not injure other ships or the port or the freedom of navigation. This question might one day be judicially determined by international arbitration. Some Danish, Swedish, Norwegian and French vessels were also taken over under the right of angary and would presumably be compensated for at full value. An inter-American economic committee in May passed resolutions authorizing the requisition of refugee tonnage. The shortage of tonnage led to a distinction between unused, laid-up tonnage and that used in active navigation coming on occasion to neutral ports of call. Whether such a distinction would become law remained to be seen.

The United States unilaterally withdrew its participation in the International Load Line convention of 1930 on the alleged doctrine of *rebus sic stantibus*, that is, that "changed conditions" warranted release from treaty obligations. This legal contention was severely criticized by Professor Briggs in the *American Journal of International Law*, 36:89.

The German steamer "Odenwald," falsely flying the American flag, was seized by an American cruiser in Nov. 1941, after an attempt had been made to scuttle the ship. She was libelled in Puerto Rico on a claim for salvage, although she had not wished to be saved. The case was pending at the close of 1941. Had the seizure taken place after Dec. 11 the libel would have been for condemnation in prize.

Governments in Exile.—The war in Europe and U.S. legislation consequent thereon created numerous problems for U.S. courts in 1941. Conflicts between decrees of the governments in exile in London and orders from the German occupying authority in Holland, Denmark, France and other countries as to the disposition of property in New York banks and elsewhere in the United States led to important cases. The policy of United States and New York law was to admit the right and power of the governments in exile, formally recognized by the United States, to issue decrees governing the nationals of those countries and their property abroad. The Dutch decree of May 24, 1940, vesting the control of all Dutch-owned assets of the United States in the Dutch government in London acting through the Dutch minister in Washington, was recognized as valid by the New York courts partly on political grounds but also on the ground that it was not a confiscatory but a conservatory measure. The courts subordinated to the Netherlands decree the claims of an alien or his assignee based on a foreign cause of action and an attachment subsequent to May 24, 1940. The New York law of 1941 undertook to protect banks in refusing to pay deposits on demands from occupied countries whose governments were not yet recognized as *de jure* by the U.S. The U.S. freezing orders undertook not to expropriate but merely to restrain the transfer or payment of money in the custody of American nationals with a view to protecting "the dominated nation and its nationals and American creditors."

There seemed to be a growing disposition in American courts, now that the United States by assignment under the Litvinov agreement was the assignee of claims owned by the soviet government in the United States, to endeavour to sustain, contrary to the earlier views, soviet decrees confiscating Russian property in the United States at least when the rights of American citizens or creditors were not involved. It would be interesting to see whether French and other foreign decrees purporting to confiscate the property of nationals or ex-nationals in the United States would be given effect by U.S. courts.

Sovereign Immunity.—With the growing participation of governments and government departments or agencies in commercial affairs, private plaintiffs against such departments or agencies found themselves met by the plea of defendant's sovereign immunity from suit. The courts found some difficulty in knowing how to handle such cases, especially where not aided by an authoritative finding of sovereign immunity from suit by the department of state. The year 1941 presented numerous cases of that type. In a bondholder's suit against a Polish bank closely related to the Polish government which guaranteed its bonds, the state department was unwilling to assume responsibility for considering the bank a branch of the Polish state, whereupon immunity was denied. In another case where an attorney sued the Spanish state for unpaid fees for services rendered to the Loyalists, immunity was granted on the bare fact that a government was being sued. Circuit Judge Clark properly held no claim to immunity necessary where the facts clearly showed the defendant to be a foreign state. Executive or foreign government intervention to claim exemption from the jurisdiction seemed necessary only where the defendant's status as a government or government agency was unclear. In *Sullivan* v. *State of São Paulo*, 122 F. (2d) 355 (C.C.A., 2nd, 1941), Judge Clark went further, and, notwithstanding a somewhat equivocal avowal of the state department that the federal government of Brazil had manifested an interest in this suit of an American holder of defaulted São Paulo bonds, the court granted immunity on the ground that São Paulo was on a par with a state of the United States.

This immunity was more doubtful since São Paulo was not an international personality; but the matter was in much dispute in scientific circles.

In the "Uxmal," 40 F. Supp. 258, immunity was denied to a ship owned by the Yucatan sisal monopoly of the Mexican government, notwithstanding the ambassador's petition, because of an alleged waiver by the sisal association.

Foreign Bank Claims.—There were several cases where the branches of foreign banks in the United States were sued in the U.S. on claims held against the parent bank in Europe and the question in issue was the extent to which foreign exchange regulations and other state controls abroad operated in the United States as a bar to the plaintiff's relief.

Some courts at least gave effect to such regulations and controls if they operated internally on property abroad but declined to give them extra-territorial effect.

The unfairness of the rule that although unrecognized governments are not permitted to sue, nevertheless the statute of limitations is not tolled, so that the claim becomes outlawed, was again exemplified in a suit by the soviet government against the National City bank arising out of the notorious Cibrario transaction. (*See* also NEUTRALITY; PACIFISM.) (E. BD.)

International Trade.

The foreign trade of 22 countries for the first six months of 1940 and 1941 is shown in Table I. The list includes 7 European, 9 American, 3 Asiatic, 1 African and 2 Oceanic countries. The countries are ranged in descending order according to the dollar value of their total trade, imports and exports combined. The total in millions of United States currency dollars has been obtained by converting the amounts in original currencies at average rates of exchange. The totals in millions of the old gold dollars are shown for the purpose of comparison with the data published in previous years. The aggregate value of the trade of these 22 countries from Jan. 1 to June 30, 1941, was $8,698,570,000 currency as against $8,497,878,000 for the corresponding period of 1940, an increase of $200,692,000 or 2·4%. Of the countries listed, eight showed an increase of $765,830,000 in 1941, while the remaining 14 suffered a loss of $565,138,000. The foreign trade of the United States increased $322,038,000, and the trade of Canada $84,920,000; the increase for the other six countries amounting only to $158,872,000. The losses were largest for Argentina, Australia, Sweden, Rumania, Dutch East Indies and Switzerland.

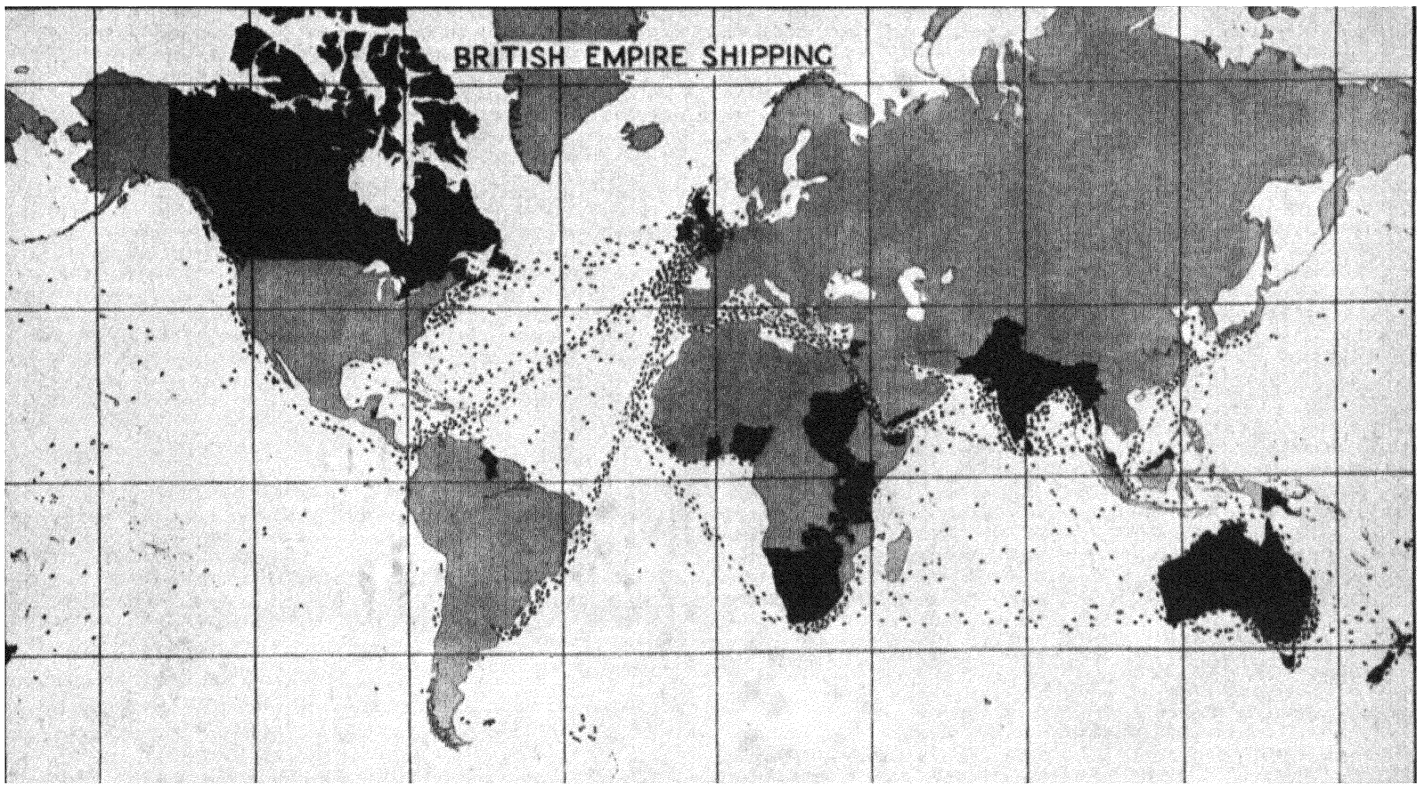
Table I.—*Foreign Trade of 22 Countries*

For the first 6 months of 1940 and 1941 (in millions)

		1940	1941
United States	$	3,358	3,680
Canada	Can. $	1,044	1,358
Australia	£	134	107
China	yuan	1,901	2,742
Argentina	pesos	1,756	1,239
Switzerland	francs	1,832	1,581
Dutch East Indies	florins	719	638
Sweden	crowns	1,840	1,390
Brazil	milreis	5,446	5,449
Denmark	crowns	1,452	1,322
New Zealand	£N.Z.	70	59
Cuba	pesos	135	165
Rumania	lei	35,604	25,169
Chile	pesos	630	572
Ceylon	rupees	339	337
Portugal	escudos	2,067	1,936
Bulgaria	leva	5,549	5,929
Peru	soles	362	398
Gold Coast	£	10	10
Iceland	crowns	74	148
Guatemala	quetzales	17	15
Haiti	gourdes	38	36
Total	currency $	8,498	8,699
Total	old gold $	5,019	5,138

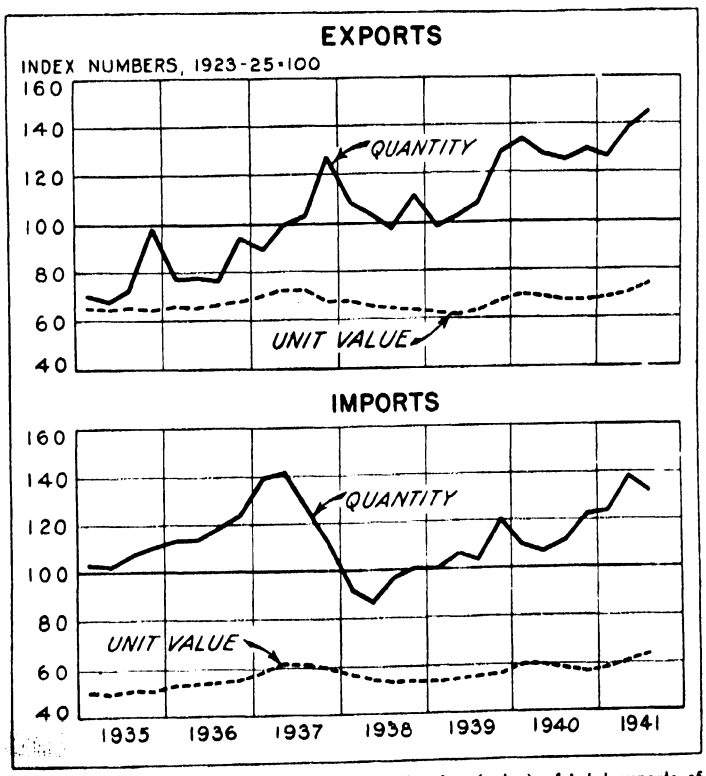
After June 1940 international trade was carried on only by the countries of the British empire, the 21 American republics, China, Japan and a few smaller countries that have preserved at least a shadow of independence. The year 1941 was a war year, and the volume of world trade was reduced still further as the countries overrun by Germany were eliminated from participation.

By lowering the standard of living the war threw new light on the social value of trade. A hundred years ago commodities like sugar, coffee, tea, cacao, rice, tapioca, oranges and lemons were still luxuries of the rich—by the end of the 19th century international trade made them necessaries of the poor as well as the rich. World War II, on the contrary, promoted not only the articles named, but even such important foods as butter and milk and numerous other commodities into the class of luxuries strictly rationed or not to be had at all, except in a black market at exorbitant prices. Golf balls are scarce in Germany, beer is rationed in Tokyo, nearly everything is rationed in Italy. Even before the war many countries had



DENSITY OF BRITISH TRAFFIC on the principal maritime routes of the world prior to the outbreak of war. Each dot represents a British ship at sea March 7, 1936, when all ships of 3,000 tons or more were required to report their positions to the admiralty in London. There were 1,462 on the high seas and 995 in inland or coastal waters, or in harbours. During 1941 much of the Mediterranean traffic to the east was detoured around Africa

sought to restrict the volume of foreign trade by high duties, preferences, quotas, currency measures and direct prohibitions. The intention may have been to protect national standards against foreign competition and achieve economic self-sufficiency, but the results were only a shrinkage of foreign trade and an increased cost of living. The war intensified these evils. It brought suffering to millions; it also demonstrated the need of liberal trading policies for the future. In the so-called Atlantic Charter of Aug. 14 Prime Minister Churchill of the United Kingdom and President Roosevelt of the United States proclaimed on behalf of their countries that they would endeavour, "with due respect for their existing obligations, to further the enjoyment by all states, great or small, victor or vanquished, of access, on equal terms, to the trade and to the raw materials of the world which are needed for their economic prosperity." And in a letter read before the National Foreign Trade convention in New York on Oct. 7, Pres. Roosevelt declared that "we must make sure that no effort will be spared to place international commerce on a basis of fair dealing, equality of treatment and mutual benefit. In no other way can it serve the function of promoting, rather than retarding, peaceful relations among nations and the economic well-being of all." Those were reassuring words, even though the promise of access to raw materials might be only a pointless concession to German propaganda. In peacetimes the Germans always could, and did, obtain all necessary raw materials on equal terms with others and occasionally at prices below the cost of production. By access to raw materials they really meant ownership or control of the country of production for the purposes of war. What the world needs are peace and co-operation toward greater freedom of trade rather than mere changes in the ownership of territory.



INDEXES OF CHANGES in quantity and unit value (price) of total exports of United States merchandise and imports for consumption, by quarters—1935-41. Prepared in the Bureau of Foreign and Domestic Commerce

United States.—Table II shows exports, imports and balance of trade of the United States.

Table II.—*Balance of Trade of U.S., 1929 and 1934-41*

(All figures in millions of dollars)

Year	Merchandise		Excess of exports (+) or imports (—)		
	Total Exports*	General Imports	Merchandise	Gold	Silver
1929	5,241	4,399	+ 842	— 175	+ 19
1934	2,133	1,655	+ 478	—1,134	— 86
1935	2,283	2,047	+ 235	—1,739	—336
1936	2,456	2,423	+ 33	—1,117	—171
1937	3,340	3,084	+ 265	—1,586	— 80
1938	3,094	1,960	+1,134	—1,974	—223
1939	3,177	2,318	+ 859	—3,574	— 71
1940	4,021	2,625	+1,396	—4,744	— 55
1940 (8 months)	2,732	1,747	+ 985	—3,617	— 36
1941 (8 months)	2,900	2,154	+ 746	— 773	— 28
Year to Aug. 31:					
1939	2,941	2,132	+ 809	—4,061	—146
1940	4,013	2,626	+1,387	—4,632	— 53
1941	4,189	3,033	+1,156	—1,000	— 46

*Re-exports of imported merchandise are included.

The war had a profound influence on the foreign trade of the United States, particularly since America became the "arsenal of democracy" and undertook under the lend-lease act to supply means of defense to any nation fighting the aggressors, that is, the Berlin-Rome-Tokyo axis and its satellites. That resulted in numerous shifts among the principal countries of origin and destination as well as among the commodities imported and exported. In the first six months of 1939 the combined share of the 20 Latin American republics and the British empire countries in the trade of the United States was 57.8% in imports, 57.5% in exports and 57.6% in total trade. The war closed the European markets to Latin America and increased the dependence of the United Kingdom on American supplies, and in the first six months of 1940 and 1941 the share of those two groups of countries in U.S. trade increased to 61.5% and 78.2%, respectively. In

1941 Latin America supplied $499,740,000 or 31.3% of U.S. imports, as against $322,902,000 or 25% in 1940, and took $401,299,000 or 19.2% of U.S. exports, as compared with $378,454,000 or 18.3% in 1940. Imports from the countries of the British empire totalled $676,473,000 or 42.4% of total in 1941, as against $521,736,000 or 40.3% in 1940, while U.S. exports to those countries rose from $840,826,000 or 40.7% in 1940 to $1,299,296,000 or 62.3% of total in 1941. Imports from the United Kingdom declined from $78,300,000 to $66,162,000, while the imports from the British East Indies and Australia increased sharply, the latter due to the importation of 115,651,000 lb. of Australian wool in 1941 as against only 13,649,000 lb. in 1940. Exports to the United Kingdom rose from $358,861,000 in 1940 to $623,419,000 in 1941.

War caused large increases in the imports of raw materials and the exports of finished manufactures. United States imports for consumption for the first eight months of 1941 were valued at $2,050,453,000, as against $1,675,921,000 in 1940, an increase of $374,532,000 or 22.3%. There was a decline of $11,552,000 in the imports of finished manufactures, chiefly leather and textiles, but increases in all other classes: in raw materials (wool, rubber, ores, hides, furs, petroleum, cotton), foodstuffs (coffee, cacao, sugar), and semimanufactures (copper, tin, lumber). Exports of U.S. merchandise totalled $2,830,625,000 for the first eight months of 1941, as against $2,673,117,000 in 1940, an increase of $157,508,000 or 5.9%. Exports of finished manufactures increased $430,127,000 to a total of $1,955,423,000, the principal exports being aircraft, industrial machinery, iron and steel, firearms and ammunition, electric machinery, motor trucks and cotton manufactures. There was an increase of $45,093,000 in the exports of manufactured foodstuffs (meats, dairy products), but exports of crude materials declined $173,104,000, crude foodstuffs $12,664,000, and semimanufactures $131,944,000. Exports of raw cotton went down from 1,753,633,000 to 311,952,000 lb., the value declining from $183,601,000 to $36,640,000.

In the second year of the war ending Aug. 31, 1941, finished manufactures valued at $2,760,000,000 represented 66% of total U.S. exports, the value showing an increase of $627,000,000 or 29% over the first year of the war and 78% over the year ended Aug. 1939. The exports of aircraft more than doubled in value, advancing from $246,000,000 in the first year of the war to $492,000,000, while munitions, firearms and explosives nearly tripled, increasing from $62,000,000 to $173,000,000. (*See* also BUSINESS REVIEW: *U.S. Foreign Trade.*)

United Kingdom.—British imports for the calendar year 1940, valued at £1,099,868,877, showed an increase of £214,356,375 or 24.2% over 1939, while exports of British goods declined from £439,535,710 to £413,084,205, or 6%, and re-exports of foreign merchandise went down 41.1%, from £46,033,592 to £26,188,957. No official trade reports were published for 1941, but the indications were that imports increased, while strenuous efforts were being made to maintain a steady flow of exports, even though on a slightly reduced scale.

Table III.—*Foreign Trade Values in United Kingdom*

Year	Total Imports (£1,000)	Exports of United Kingdom Goods (£1,000)	Exports of Imported Merchandise (£1,000)
1929	1,220,765	729,349	100,702
1934	731,414	395,986	51,243
1935	756,037	425,921	55,266
1936	847,752	440,605	60,769
1937	1,027,824	521,391	75,134
1938	910,500	470,755	61,525
1939	885,512	439,536	46,034
1940	1,000,869	413,084	26,189

Germany.—More than 18 centuries ago Tacitus noted that the Germans fought for booty, the Gauls for liberty (*Germanos ad praedam, Gallos pro libertate*). They still did. Although no official reports on the foreign trade of Germany have been issued since July 1939, it was certain that both the volume and the value of the trade declined in 1940 and still further in 1941, since Germany had invented an "ersatz" or substitute for foreign trade. That ersatz is loot. Countless carloads of flour, butter, meat, other foodstuffs, raw materials, oil, machines, implements of war, even fences, doorknobs and scrap, were transported to Germany after every invasion. Surpluses of material goods could be looted only once, however, and so the Germans looted also the labour power of the subjugated nations by transporting more than 2,000,000 men and women to German farms and factories and enslaving other millions in their own homes. In the subjugated countries the Germans also confiscated or nominally purchased with worthless paper money numerous industrial and commercial establishments, including their foreign branches. In Argentina alone, according to a parliamentary investigation, the Germans thus gained control of approximately $455,000,000 worth of business and industry.

Other Countries.—The foreign trade of Canada for the first eight months of 1941 totalled $1,952,616,000 (Canadian) as against $1,448,967,000 in 1940, an increase of 34.8%. Imports for consumption valued at $910,905,000 in 1941 had increased 33.5%; exports of Canadian goods, valued at $1,029,991,000, showed an increase of 35.6%. In 1941, as in 1940, countries of the British empire supplied over 25% of Canadian imports and took over 56% of Canadian exports, but there were notable shifts among the several countries. In the trade with the United Kingdom imports declined $5,877,000, while exports increased $112,830,000 to a total of $449,245,000. United States share in Canadian trade declined from 36.5% to 35.5% in exports and rose from 67.9% to 68.9% in imports. The remarkable increase from $595,000 to $44,670,000 in the exports to Egypt was due to shipments of war materials to the near east.

Argentina exported 3,170,967 metric tons of goods valued at 730,446,000 pesos in the first six months of 1941, as against 6,370,007 tons valued at 925,012,000 pesos in 1940. The quantity exported was the lowest in the past decade. Exports of maize went down from 1,352,960 to 279,227 tons; exports of wheat from 2,287,195 to 1,301,801 tons. Decreases were noted also in the exports of linseed, barley, wheat flour, seeds and oilseed cakes. Exports of wool increased from 79,175 to 121,638 metric tons, and exports of cotton from 10,497 to 24,649 tons, while the quantities of meats and hides exported showed but little change. The war had closed most of the European markets to Argentina and raised the importance of the American markets. In the first nine months of 1941 Argentina exported to the continental United States goods valued at $129,867,000, a value greater than the exports for the whole year 1929 which had been a record, and an increase of 139% over the first nine months of 1940. The trade would doubtless increase further under the agreement between Argentina and the United States concluded in the fall of 1941.

Brazilian exports for the first six months of 1941 totalled 1,695,832 metric tons valued at 3,085,509 contos of reis, an increase of 7.3% in quantity and 15.1% in value over the first six months of 1940. Exports to the United States increased from 932,032 to 1,685,155 contos, and exports to other American countries from 249,010 to 500,252 contos, while exports to European countries declined from 1,241,746 to 534,026 contos, the United Kingdom taking 374,006 contos in 1941 as against 540,287 contos in 1940. The exports of coffee increased from 6,474,538 to 6,880,605 bags of 60 kilos, the United States alone taking 6,041,173 bags in 1941, as against 4,027,883 bags in 1940. In the last three half-yearly periods exports of coffee to France were 764,808 bags in 1939, 864,898 bags in 1940 and 15 bags in 1941, while exports to Germany decreased from 790,255 bags in 1939 to 63,188 in 1940 and 124 in 1941. Brazilian imports for the first six months of 1941 totalled 1,761,684 metric tons valued at 2,363,840 contos of reis, a decline of 21.1% in quantity and 14.5% in value. Imports from the United States went up from 1,352,071 to 1,389,369 contos, while imports from European countries declined from 717,896 to 352,825 contos. Imports from Japan increased from 63,117 to 68,356 contos.

In the trade of Cuba for the first six months of 1940 and 1941 imports from the United States increased from 74.2% to 87.6% of total, while imports from Europe declined from 12.7% to 4.3%. Exports to the United States went up from 80.2% to 92.5%; exports to Europe declined from 17.2% to 3.6%. Trade with the United Kingdom declined from 8,659,000 to 3,895,000 pesos.

The value of the foreign trade of Iceland for the first seven months of 1940 and 1941 increased from 35,430,000 to 59,763,000 crowns in imports, and from 53,042,000 to 110,991,000 in exports. In 1941 the United Kingdom supplied 64.9% of imports and took 84.6% of exports. The country exported 78,901 metric tons of fresh and frozen fish in 1941 as compared with 59,231 tons in 1940, the value rising from 27,377,000 to 73,314,000 crowns.

In the first six months of 1941 China imported 528,313 metric tons of rice and 280,355 tons of wheat flour, as compared with 337,216 and 100,877 tons respectively, in 1940.

New Zealand trade for the first six months of 1940 and 1941, expressed in New Zealand pounds sterling, declined from £24,869,580 to £22,056,878 in imports and from £44,631,839 to £36,657,236 in exports. The increase in the exports of dairy products was not sufficient to make up the loss in th exports of meats and wool. The exports of wool declined from 715,475 bales valued at £13,296,951 in 1940 to 416,372 bales valued at £8,030,917 in 1941.

France, Germany, Italy, Japan, the U.S.S.R. and the United Kingdom did not issue any trade reports for 1941. (*See* also AGRICULTURE; TRADE AGREEMENTS.)

(J. J. K.)

Interstate Commerce Commission.

The interstate commerce commission, created Feb. 4, 1887, for the regulation of carriers engaged in interstate commerce, consists of 11 members appointed by the president. From its membership the commission selects its chairman (Joseph B. Eastman in 1941).

Like most of the agencies of the government in 1941, the interstate commerce commission was involved to a considerable extent with the defense program. It co-operated with Ralph Budd, transportation commissioner under the Office for Emergency Management (*q.v.*), in transportation matters related to defense.

The railroads, which, as in preceding years, continued to carry the greater part of the nation's freight, were called upon to handle additional traffic resulting from the movement of defense materials in 1941. To aid them in securing maximum use of their facilities, the interstate commerce commission expanded its bureau of service, originally established some 20 years before.

Likewise the interstate commerce commission had a part in the effort to promote the most effective use of motor transportation in 1941 through the organization of central and regional motor transportation committees. One of the commissioners served as chairman of the central committee, and the chairmen of the 16 regional committees were field officials of its bureau of motor carriers. Because of the diversion of tank vessels to Great Britain in 1941 and other reasons, pipe-line transportation of petroleum increased in importance. The interstate commerce commission was accordingly concerned with additional regulatory problems in-

volving pipe lines.

One of the most important accomplishments of the interstate commerce commission in 1941 was the completion of an exhaustive report to congress on the question of federal regulation of the sizes and weights of motor vehicles. Such regulation was favoured by many motor-carrier operators, who complained of the inconvenience caused by the diversity of limitations on size and weight under statutes of certain states. Federal legislation on this subject, however, was opposed by many state officials on the ground that it would be an invasion of state sovereignty.

The commission organized a bureau of water carriers in 1941 as its principal instrumentality in administering the water-carrier regulation provided in the Transportation act of 1940.

Intestinal Disorders: *see* ALIMENTARY SYSTEM, DISORDERS OF.

Intoxication, Alcoholic. A symposium dealing with the scientific description and control of individual and social problems of alcoholism was held at Philadelphia, Pa., on Dec. 27–29, 1940.

The medical, public health, sociological and economic significance of the alcohol problem continued to be obscured by its moral, profit and revenue motivations. It was obscured also by a lack of exact knowledge concerning its magnitude; where, when and under what conditions it occurs, and by no little controversy as to its exact nature. Chronic alcoholism was said to be increasing. The number of local communities which by popular vote have exercised their option to prohibit licences for the sale of alcoholic beverages increased.

Early in World War I, France instituted strict measures for the control of alcoholism with material success in reducing its incidence. It was realized at that time that alcoholism would help in part to generate civil and military panic. In Aug. 1938, a time of political unrest in Paris, alcoholism almost doubled, later returning to its usual incidence. Again in Aug. 1939, under pressure of national distress, alcoholism increased 186%. For a time thereafter war was nearly forgotten, and the usual situation respecting alcoholism obtained until May 1940 when the German offensive began. Defeat and evacuation pushed alcoholism and drunkenness to its former peak, and only then did the government of Paris tardily invoke measures for its control.

In a more specific sense the literature on acute alcoholic intoxication dealt, in large measure, with methods and means for its diagnosis with particular reference to the enforcement of motor vehicle traffic laws and the admissibility of evidence based upon the results of chemical tests for alcohol in body fluids. One state supreme court confirmed a previous conviction in a lower court, wherein the defendant in his appeal, plead that the results of chemical tests for alcohol in his body fluids compelled him to be a witness against himself. Other contributions, based on the application of special laboratory tests of skill, claimed that blood alcohol concentration alone is not an accurate index of the degree of "drunkenness."

In the field of treatment for chronic alcoholism, the uses of hypertonic sodium chloride solution intravenously was advocated for delirium tremens and alcoholic hallucinosis. It was claimed that it reduces the incidence of lobar pneumonia in these cases. The use of the principles of the conditioned reflex as a therapeutic measure in chronic alcoholism was again revived. In the treatment of alcoholic polyneuritis intensive vitamin therapy seemed to offer little advantage over that of foods rich in natural vitamin content.

The so-called depravity of chronic drinkers is but a part of a disturbed functioning of a personality. The mosaic of their experiences in infancy, childhood and adolescence is often misevaluated or misinterpreted by them, or is given false or incorrect emotional values that are carried over into maturity.

Most of them have never had that confident feeling of being at home in the world, or that their environment and associates are satisfying and that the world is an interesting and dramatic place in which to live. Their dependence on others, their lack of assurance in being a person, their self condemnation and self pity are proverbial. The confidence inspired by an understanding appreciation of their difficulties through the medium of one or several persons has in some instances resulted in their reclamation.

The "Alcoholics Anonymous" movement composed of an experienced group has served in some instances as a prop on which the unfortunate alcoholic may temporarily lean and through group encouragement and mutual understanding take his place and do his part among his fellows. (*See* also PSYCHIATRY: *Alcoholism.*)

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Inventions: *see* PATENTS.

Investment Banking: *see* BANKING: *Investment Banking.*

Iodine. The production of iodine in the United States has not been reported since 1937, when it was 299,286 lb., but it is known to have increased each succeeding year. Imports from Chile increased heavily in 1940 to 1,244,181 lb., and the valuation of the imports increased from 84 cents per lb. in 1939 to $1.04 in 1940. The Chilean production was expected to exceed 1,000 metric tons in 1940, and sales for the fiscal year ending July 30, 1940, were 1,247 tons. Japan has an output of about 100 tons and Italy one of 25–30 tons annually, but no recent data are available. (G. A. Ro.)

Iowa. A north central state of the United States, admitted as the 29th state on Dec. 28, 1846; popularly known as the "Hawkeye state." Area, 56,280 sq.mi.; pop. (1940) 2,538,268. The urban population was 1,084,231; rural was 1,454,037, of which 916,768 lived on farms. Of the total population, 2,403,446 were native whites, 117,245 foreign-born whites, 16,694 Negroes and 883 belonged to other races. Capital, Des Moines (159,819). Other principal cities are Sioux City (82,364), Davenport (66,039), Cedar Rapids (62,120), Waterloo (51,743) and Dubuque (43,892).

History.—The officers elected on Nov. 5, 1940, who took office in Jan. 1941, were: governor, George A. Wilson; lieut. gov., B. B. Hickenlooper; auditor, C. B. Akers; treasurer, W. G. C. Bagley; secretary of state, Earl G. Miller; secretary of agriculture, Mark G. Thornburg; attorney general, John M. Rankin; and superintendent of public instruction, Jessie M. Parker. All were Republicans, and all except the attorney general were serving second terms.

Education.—For the school year 1940–41, the total number of children in Iowa of school age (5–21 years) was 676,262, of whom 358,527 were enrolled in public elementary schools, 137,646 in public high schools and 2,489 in public junior colleges. The total expenditure for public schools by school districts was $47,111,774.11, $42,567,613.51 of which was raised by a general property tax in local districts. The illiteracy rate in Iowa was .8 of 1%. (*See* IOWA, STATE UNIVERSITY OF; IOWA STATE COLLEGE.)

Public Welfare, Charities, Correction.—A state board of social welfare, composed of three members appointed by the governor (King R. Palmer, chairman in 1941), administers old-age assistance, aid to the blind, aid to dependent children, child welfare and state grants for relief. Working with it in 1941 were local social welfare boards in the 99 counties. For the year 1941–42, the state appropriated $8,500,000 for old-age pensions, $500,000 for state emergency relief, and $260,000 for child welfare and aid to the blind. General relief and mothers' pensions were handled by the county authorities.

The full-time board of control, with three members appointed by the governor (P. F. Hopkins, chairman in 1941), had charge of the state's penal, correctional and eleemosynary institutions.

Finance and Banking.—Taxable property in Iowa on Jan. 3, 1941, was estimated at $3,000,000,000. The income of the state government for 1940–41 included $5,015,238 from the general property tax and some $52,057,012 from taxes on cigarettes, gasoline, incomes, retail sales and other special taxes. There were 103 national banks, 297 savings banks, 246 state banks, 1 trust company and 59 building and loan associations in Iowa in 1941. The report for June 30, 1941, showed total deposits of $288,242,000 in the national banks and total resources of $315,453,000. The deposits in the 544 state banks, savings banks and trust companies chartered by the state, as of Sept. 24, 1941, totalled $493,757,235; resources were $546,203,125.

Communication.—The state highway commission, Ames, has charge of all primary roads in the state. By July 1, 1941, 5,364 mi. of primary roads of Iowa were paved and 3,139 mi. were gravelled or otherwise surfaced. On the secondary road system 41,682.2 mi. were gravelled. For the fiscal year 1940–41 construction work on primary roads cost the state $8,003,143.16. Counties spent $7,435,921.34 for construction work on secondary roads. For the year 1939–40 the state spent $4,560,040 on farm-to-market roads, $2,060,040 of which was federal funds. There were 9,017 mi. of steam railways in 1940. Motor carriers for the year 1939 reported 113,532,622 passenger miles. Regular air service crosses the state with airports at Iowa City and Des Moines. Iowa had approximately one telephone for every five persons in 1941.

Agriculture.—There were 211,500 farms in Iowa in 1941 with 34,637,990 acres. Crops were good in 1941, although lack of moisture affected the production in some areas. The total value of agricultural production in 1941 from the 20,580,000 acres harvested was estimated at $471,710,000. In the first nine months of 1941, Iowa farmers received a cash income of $617,734,000, of which $503,673,000 came from livestock, $105,111,000 from crops, and $8,950,000 from government payments.

Table I.—*Leading Agricultural Products of Iowa, 1941 and 1940*

Crop	1941	1940
Corn, bu.	464,814,000	473,760,000
Oats, bu.	177,280,000	199,353,000
Hay, tame, tons	5,581,000	6,350,000
Soybeans (grain), bu.	16,608,000	14,180,000
Soybeans (hay), tons*	516,000	1,227,000
Barley, bu.	6,930,000	12,870,000
Wheat, bu.	2,943,000	7,603,000
Potatoes, bu.	5,712,000	5,700,000
Rye, bu.	270,000	684,000

*Included in the figures for tame hay.

Manufacturing.—The total value of products manufactured in Iowa in 1939 was $718,531,801. There were 2,670 manufacturing establishments with 11,501 salaried employees who received $23,535,779 and 65,314 wage earners who received $73,466,119. Meat packing headed the list of Iowa industries, employing about one-sixth of the wage earners. The products were valued at $257,314,633. Second in value was buttermaking, with a product valued at $60,380,974.

Mineral Production.—Iowa ranked 29th among the states in importance of minerals in 1939; the total value of such products in that year was $25,483,936. Most important products were cement, coal, stone and gypsum.

Table II.—*Principal Mineral Products of Iowa, 1939 and 1938*

	Value, 1939	Value, 1938
Cement	$7,771,503	$7,327,048
Coal	7,503,000	7,963,000
Gypsum	510,120	495,856
Sand and gravel	1,299,449	2,299,682
Stone	4,385,234	3,782,480

(R. A. GA.)

Iowa, State University of.

An institution of higher learning at Iowa City, Ia., established Feb. 25, 1847 by Iowa's first general assembly. It was the first state university to admit women on equal standing with men.

A new all-time enrolment record for the 12 months ending in June 1941 was set at 10,820, marking the sixth time that the 10,000 mark had been passed. Most of the gain was accounted for by the record Sept. 1940–June 1941 enrolment of 7,185. The university granted 1,764 degrees, second highest total in its history. The 651 degrees awarded by the graduate college constituted a record. Virgil M. Hancher was inaugurated in May as the 13th regular president. An addition was built to provide added facilities for the university theatre. More than 1,000 persons were taught in about 40 national defense courses by the college of engineering. A staff of 669 persons gave instruction in the nine colleges and five schools. (E. C. W.)

Iowa State College.

An institution of higher learning at Ames, Ia. Like other land-grant colleges and universities, Iowa State college during 1941 geared its activities to national defense in agriculture, engineering, home economics, science and veterinary medicine. About 750 nonstudents were trained both on and off the campus in engineering defense courses. More than 100 students completed aviation work in the civilian pilot training program. The college took an active part through its extension service in citizenship and democracy training and in the "food for freedom" speeding up of agricultural production, including a campaign for improvement of nutrition of residents of the state. Construction of a new men's dormitory to house 450 students was started and 1½ mi. of campus drives were paved. Instruction in aeronautical engineering was given the status of a full four-year curriculum. The graduate college celebrated the 25th anniversary of its founding. In the year ending in June 1941, resident enrolment in Iowa State college reached a new high of 8,104 students, including 2,619 women and 1,119 graduate students. (R. W. BE.)

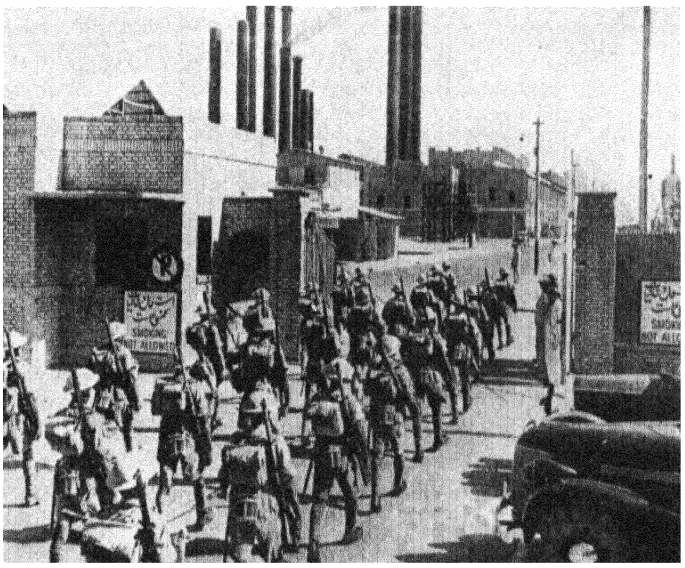
Iran.

Known before March 1935 as Persia, Iran is a country of western Asia bounded to the east by India and Afghanistan, to the north by the U.S.S.R., to the west by Iraq and Turkey, and to the southwest and south by the Persian gulf and Arabian sea; ruled since 1926 as a constitutional kingdom. Ruler: Shah Mohammed Reza; premier, Mohammed Ali Feroughi. Area, *c.* 628,000 sq.mi.; pop. (est.), 15,000,000. Chief towns: Tehran (cap., 360,000), Tabriz (220,000), Meshed (140,000), Shiraz (120,000), Isfahan (100,000). Language, Persian; religion, Mohammedan.

History.—German attempts to create a fifth column and to secure dominating influence in Iran continued in 1941 to jeopardize British and Allied interests in the middle east. A steady infiltration of nazi agents in the guise of "tourists" increased the German colony to between 2,000 and 3,000 and provoked representations from the British government, who urged that Iran's neutrality was being compromised. Earlier warnings having been ignored, following the invasion of the U.S.S.R., Sir Reader Bullard, British minister in Tehran, on July 16 made further emphatic approaches to the Iranian government concerning the situation, and similar action was taken by the soviet minister. The government undertook to reduce drastically the number of Germans resident in the country, but the position was virtually unchanged up to Aug. 16, when the British and soviet ministers again made representations.

As the Iranian government showed no signs of fulfilling their undertaking, British and Russian forces crossed the frontiers of Iran early in the morning of Aug. 25 to safeguard Allied interests. Some slight resistance was offered, but the premier, Ali Mansur, resigned on Aug. 27 and hostilities ceased after the formation of a new government under Ali Feroughi.

Pending a definitive agreement, the occupying forces continued their advance. On Sept. 10 the government accepted the Anglo-soviet terms, which included the closing of the German, Italian, Hungarian and Rumanian legations, the surrender of enemy nationals, and provision of facilities for war transport to the U.S.S.R. Delay in implementing the second of these conditions drew from Moscow an accusation that a policy of obstructionism was being fostered by the shah, Reza Pahlevi. Rising internal



INDIAN RIFLEMEN marching into the huge petroleum refinery on the island of Aradian, in the Persian gulf, during the Anglo-Russian invasion of Iran in 1941.

discontent, aggravated by acute food shortages, led to the abdication of the shah on Sept. 16 in favour of his 21-year-old son, Mohammed Reza Pahlevi (*q.v.*). Ali Feroughi reorganized his cabinet, diplomatic relations with the axis and with Bucharest were broken off, and the new government laid down a program of progressive reform and collaboration with powers whose interests were associated with their own. Upon demands by certain deputies for the trial of the ex-shah on charges concerning his income and the alleged disappearance of some of the crown jewels, he was found to have fled, and Oct. 18 it was stated that he had arrived at Mauritius.

On Oct. 19 the Anglo-Russian forces withdrew from Tehran to agreed positions. In November it was announced that British and U.S. missions would shortly be sent to Iran to speed up supplies to the U.S.S.R., and news was given of the opening of a new supply route from India to the U.S.S.R. via Baluchistan and Iran. At the close of the year vast quantities of war material were arriving in Iranian ports from all parts of the British empire. (*See* also WORLD WAR II.) (D. A. C.)

Education.—(1937): 4,939 schools; 273,600 scholars; one university at Tehran.

Banking and Finance.—Revenue, ordinary (est. 1940–41) 3,095,000,000 rials; expenditure (est. 1940–41) 3,211,000,000 rials; foreign loan (May 15, 1940) £951,706; public debt (Dec. 31, 1938) 98,900,000 rials; note circulation (Aug. 31, 1940) 1,046,000,000 rials; gold reserve (Aug. 31, 1940) 310,949,000 rials; exchange rate (average 1940) 1 rial=5.882 cents U.S.; (Sept. 29, 1941) 1 rial=2.857 cents U.S.

Trade and Communication.—Foreign trade (merchandise) 1938–39: imports 1,072,700,000 rials; exports 2,501,300,000 rials. Communications 1938: roads fit for wheeled traffic, *c.* 8,700 mi.; railways open to traffic, 1,072 mi.

Agriculture and Mineral Production. Production, 1937–38 (in metric tons): petroleum, crude (1939) 10,367,000; wheat 1,942,300; barley, 706,900; rice, 382,100; cotton, 32,900; wool (1938) 18,100; beet sugar (1939–40) 25,200; tobacco 15,900.

Iraq, an Arab state of the near east, between Iran, Syria and Arabia, watered by the Tigris and Euphrates; an independent kingdom since 1932, when the British mandate was terminated. Area, 116,000 sq.mi.; pop. (census Oct. 1934) 3,561,000 (est. Dec. 31, 1938), 3,700,000. Chief towns: Baghdad (capital, 400,000), Mosul (260,000), Basra (180,000). Ruler: King Feisal II; regent: Prince Abdul-Ilah; premier: General Nuri es Said; language: Arabic; religion: Mohammedan.

History.—After a cabinet crisis at the end of January Rashid Ali el-Gailani resigned and was replaced as prime minister by Taha Hashimi, during whose short term of office Sir Kinahan Cornwallis was appointed British ambassador. In April a coup d'état, organized by Rashid Ali and several army leaders and supported by axis agents and by the Palestinian Arab exiles led by the Mufti of Jerusalem, resulted in the establishment of a "government of national defense" under Rashid Ali. The regent fled to Basra, and thence to Trans-Jordan, where he was joined by Nuri es Said, Jamil Midfai and others; he was replaced as regent by the Sharif Sharaf, elected by a rump parliament. The new prime minister pledged himself to observe the Anglo-Iraqi treaty, and when imperial troops landed in Basra "to open up communications," the Iraqi government provided facilities for them. But when, at the beginning of May, fresh contingents were landed, the Iraqi government declared this to be an infringement of the treaty, and fighting broke out near the British air base at Habbaniya. Main incidents of the Anglo-Iraqi conflict were the occupation of Basra by imperial troops, the unsuccessful attack upon Habbaniya by the Iraqi army, the successful attacks by the R.A.F. upon Iraqi airfields at Baghdad and elsewhere, the fighting in the desert around Rutbah, and, finally, the occupation of Baghdad by imperial troops at the beginning of June.

Rashid Ali and his associates fled to Iran. The occupation of Baghdad was followed by an armistice, and the return of the regent to the capital. The policy of the new ministry formed by Jamil Midfai was to fulfil the terms of the Anglo-Iraqi treaty; relations with Italy, and subsequently with Japan and Vichy France, were broken off, and the government did its best to co-operate with the British authorities. This policy was made easier by Anthony Eden's statement, in a message to the Iraqi foreign minister in June, that the British government respected the independence and integrity of Iraq, and were ready to co-operate in measures for its defense and prosperity. The interest of the new ministry in the pan-Arab cause was shown by the appointment of Nuri es Said as minister in Cairo.

In internal affairs attention was mainly devoted to undoing the work of Rashid Ali's regime. The actions of his government were declared invalid, and courts-martial were set up to punish the ringleaders of the coup. Rashid Ali and others escaped to Turkey and Europe.

In October bad health compelled the prime minister to resign, and he was succeeded by Nuri es Said. (A. H. Ho.)

Education.—In 1938: elementary schools, government, 741; scholars, 94,368; new schools opened 1938–39, 22; secondary schools, 14; scholars 1,904; intermediate schools, 48; scholars 10,611.

Finance. Revenue, ordinary (est. 1940–41), 6,400,000 dinars; expenditure, ordinary (est. 1940–41), 6,700,000 dinars; public debt (Dec. 31, 1938) 98,900,000 dinars; notes in circulation (Feb. 28, 1941), 5,900,000 dinars; foreign assets reserves (Nov. 1940), 6,800,000 dinars; exchange rate 1941 (currency based on sterling): 1 dinar=£1 sterling=403.5 cents.

Trade and Communication.—Foreign trade 1939 (merchandise): imports, 8,156,179 dinars; exports, domestic (excluding crude petroleum) 3,759,401 dinars. Communications: roads open to traffic (1940) *c.* 4,000 mi.; railways, open to traffic (June 1940) 947 mi.

Agriculture and Minerals. Production 1938 (in metric tons): petroleum, crude (1939), 4,116,000; wheat, 600,000; rice, 360,000; barley, 1,138,400; tobacco, 4,000; wool, 8,300; cotton, 2,600; cotton seed, 6,200.

Ireland: *see* EIRE.

Ireland, Northern. Northern Ireland comprises the six Ulster counties of Antrim, Armagh, Down, Fermanagh, Londonderry and Tyrone, forms part of the United Kingdom of Great Britain, but (since 1920) has its own parliament and executive, though also represented in the imperial parliament by 13 members. Area, 5,238 sq.mi.; pop. (June 30, 1938), 1,285,000. Chief cities (pop. census 1937): Belfast (cap., 438,086), Londonderry (47,813). Language: English; religion: Christian (Roman Catholic, 33·75%; Presbyterian, 31·4%; Episcopalian, 27%). Ruler and national flag, as for Great Britain. Gov.: the duke of Abercorn; premier: John Miller Andrews.

History.—Abnormal conditions created by World War II profoundly affected the life of Northern Ireland during 1941. Parlia-

ment was occupied with legislation dealing with a variety of wartime problems—some of them arising directly out of enemy action.

The administrative responsibility for war production in Northern Ireland was transferred to the ministry of commerce, acting as agent for the government departments concerned in London. A campaign to accelerate industrial output for war purposes was inaugurated with the support of employers and workpeople. Hutments were provided on the outskirts of the chief industrial area, for war workers whose families had removed to safety zones in the country. Thousands of women and children, and aged, blind and infirm persons were evacuated from Belfast to small provincial towns and rural districts. This upheaval of the normal life of the community produced its own problems, but the evacuees gradually adapted themselves. Experience gained in the air raids of April and May was put to good account, especially in the better equipment of the fire-fighting services. In Belfast, the civil defense authority expanded and improved its organization, especially in the provision of rest centres, emergency feeding facilities, casualty information bureaus and mobile food canteens, some provided through the generosity of the American Red Cross.

Food rationing in Northern Ireland was the same as in Great Britain. All surplus food went into the national "pool" for the feeding of the people of England, Scotland and Wales. Thousands of fat cattle and hundreds of tons of bacon and ham were sent weekly to Great Britain; the year's total of eggs shipped ran into hundreds of millions.

In the 1941 budget, introduced on April 29, 1941, provision was made for a contribution of £11,750,000 to the imperial exchequer, compared with £6,000,000 in 1940. Expenditure on war services was estimated at more than £3,000,000. Special war expenditure is refunded to Northern Ireland by the imperial exchequer. Taxation levied by the imperial parliament applies to Northern Ireland, in common with the rest of the United Kingdom. War savings in Northern Ireland amounted at the end of August to well over £24,000,000.

Lord Craigavon, who died in Nov. 1940, was succeeded in the premiership by J. M. Andrews, whose place as minister of finance was taken by J. Milne Barbour. Sir Basil Brooke became minister of commerce, and Lord Glentoran became minister of agriculture. Government policy remained unchanged. (R. D. B.)

Education.—In 1938: elementary schools, 1,700; scholars, 191,862; secondary schools, 76; scholars, 14,557; universities, students, 1,590.

Finance.—Revenue (1940–41), £23,766,644; expenditure (including £6,000,000 imperial contribution and £80,624 surplus of revenue) £23,766,644; 1941–42, estimated revenue £23,533,000; estimated expenditure £19,066,000; exchange rate 1941: £1=403.5 cents U.S.

Trade and Communication.—External trade 1938: imports £54,385,000; exports, £51,061,000. Communications 1939: roads fit for motor traffic, 13,043 mi.; railways, standard gauge, 741 mi., narrow gauge, 121 mi.; canals, 180 mi.

Agriculture and Manufacturing.—Production 1938 (in tons): potatoes, 491,000; oats, 22,700; wheat, 3,850; flax, 4,036; barley, 1,025. Livestock (1939): cattle, 700,564 head; sheep, 551,262 head; pigs, 565,726 head; poultry, number, 6,038,000. Flax acreage (1941) 90,000 (40,000 in 1940); additional grassland ploughed (1941) 250,000 acres. Agricultural statistics taken in June 1941 showed an increase in the crop-bearing area of almost 10% over the previous year and of 32% over 1939. The flax acreage was 93.6% greater than in 1940. Shipbuilding, tonnage launched (1938), 79,468; value of linen goods exported 1938, £5,480,000. (*See* also GREAT BRITAIN AND NORTHERN IRELAND: *History.*)

Irish Free State: *see* EIRE.

Iron and Steel.

Discussion of the iron and steel industry can for the most part be handled more satisfactorily subdivided into its three main headings—iron ore, pig iron and steel. Production tables under each of these headings include all countries in which production of the commodity in question has materially exceeded 1,000,000 tons, giving a coverage which in general accounts for 93–98% of the world totals. Production data having been suppressed since Sept. 1939 in most countries outside of the United States and Canada, such

IRON ORE SHIPMENTS began to move through the Great Lakes from Minnesota April 9, 1941, as the U.S. government, anxious to increase production of steel for defense, made an extra appropriation of $97,000 for ice-breaking

later figures as are presented are estimates.

Iron Ore.—Data on iron ore production had been so scarce since 1938 that no totals could be estimated in 1941, but if it is assumed that ore production had kept pace with pig iron output a rough approximation would be 200,000,000 metric tons for the world total in 1939, and 208,000,000 tons for 1940.

Table I.—*World Production of Iron Ore*
(In millions of long tons)

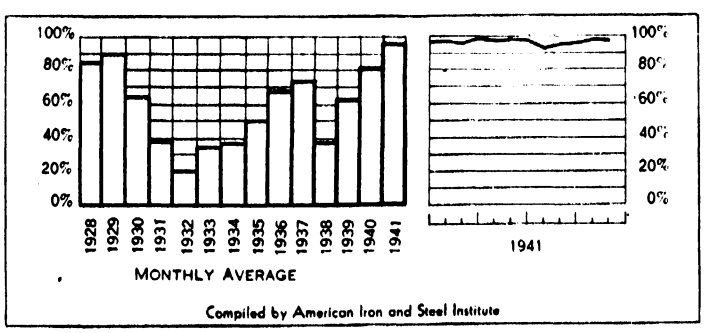
	1929	1932	1937	1938	1939
North America—					
Newfoundland	1.5	0.1	1.6	1.7	1.7
United States	73.0	9.8	72.1	28.4	52.6
South America—					
Chile	1.8	0.2	1.5	1.6	1.6
Europe—					
Austria	1.9	0.3	1.9	2.6	?
Czechoslovakia	1.8	0.6	1.8	?	?
France	49.9	27.2	37.3	32.6	?
Germany	6.3	1.3	9.4	10.8	?
Luxembourg	7.5	3.2	7.6	5.0	2.3
Spain	6.4	1.7	1.0	2.5	?
Sweden	11.3	3.2	14.7	13.7	12.8
U.S.S.R.	6.9	12.0	27.6	26.0	?
United Kingdom	13.2	7.3	14.2	11.9	?
Asia—					
China	2.6	2.2	?	?	?
India	2.4	1.8	2.9	2.8	3.1
Malaya	0.8	0.7	1.7	1.7	2.0
Africa—					
Algeria	2.2	0.5	2.3	3.0	2.7
Morocco (Span.)	1.2	0.2	1.4	1.3	?
Australia	0.9	0.6	1.9	2.3	2.6
World Total	200.0	75.0	214.0	161.0	?
Ex. U.S.A.	127.0	65.2	142.0	132.6	?
Ex. British	191.1	64.3	191.6	139.5	?
Brit. Empire	18.9	10.7	23.4	21.5	?

In the United States the 1940 output was 73,695,000 long tons, only 2% less than the high point of World War I. Shipments from the mines were 75,198,100 tons, of which 62,921,000 tons were from the Lake Superior district. Lake shipments in 1941 were estimated at more than 81,000,000 tons, and ore consumption for the year was about 75,000,000 tons. Imports were 2,479,300 tons, and exports 1,386,000 tons.

Table II.—*World Production of Pig Iron*
(In millions of long tons)

	1929	1932	1938	1939	1940
North America—					
Canada	1.2	0.2	0.7	0.8	1.0
United States	42.6	8.8	19.2	31.8	42.4
Europe—					
Belgium	4.0	2.7	2.4	3.0	2.2
Czechoslovakia	1.6	0.4	1.2	0.3	...
France	12.3	6.8	6.0	7.8	4.6
Germany	13.2	3.9	18.2	21.7	20.6
Luxembourg	2.0	1.0	1.5	1.8	1.1
U.S.S.R.	4.0	0.3	14.8	15.0	15.3
United Kingdom	7.6	3.6	6.8	8.2	8.3
Asia—					
India	1.4	0.0	1.5	1.8	?
Japan	1.5	1.5	3.1	3.3	3.0
World Total	97.2	39.2	80.5	100.0	104.0
Ex. U.S.A.	54.6	30.4	61.2	68.2	61.6
Ex. British	86.7	34.3	70.3	88.5	91.6
Brit. Empire	10.5	4.9	10.2	11.5	12.4

Pig Iron.—Outside of the United States and Canada, the only data since 1938 are the estimates in Table II.



STEEL PRODUCTION in the United States: percentage of capacity

In 1940 the United States produced 42,346,700 long tons of pig iron and ferro-alloys, an increase of 33% over 1939; shipments were 43,081,000 tons. The total for the first 11 months of 1941 was 45,553,000 tons, and for the year was estimated at 49,775,000 tons, 96.7% of plant capacity and 17% increase over 1940. Plant capacity at the end of the year was 53,705,000 tons, against 48,270,000 tons on Jan. 1, and additions planned for completion during 1942 and 1943 would raise this to 61,020,000 tons. At the end of September there had been no imports of pig iron, and exports had been 458,537 tons.

In Canada pig iron production was 1,237,000 tons to the end of Oct. 1941, equivalent to about 1,500,000 tons for the year, against 1,304,300 tons in 1940.

Steel.—As with pig iron, only United States and Canadian figures were reported in 1941; other data in the accompanying tables since 1938 are estimates.

Table III.—*World Production of Steel*
(In millions of long tons)

	1929	1932	1938	1939	1940
North America—					
Canada	1.4	0.3	1.1	1.3	2.0
United States	56.4	13.7	28.7	47.7	60.2
Europe—					
Belgium	4.0	2.7	2.2	3.0	2.2
Czechoslovakia	2.2	0.7	1.7	0.4	...
France	11.7	6.9	6.1	8.4	5.4
Germany	16.0	5.7	22.9	26.4	25.1
Italy	2.1	1.4	2.3	2.7	2.5
Luxembourg	2.7	1.9	1.4	1.8	1.3
Poland	1.4	0.5	1.5	1.6	?
Sweden	0.7	0.5	1.0	1.1	0.9
U.S.S.R.	4.6	5.7	18.2	18.5	19.5
United Kingdom	9.6	5.3	10.4	13.5	13.4
Asia—					
Japan	2.3	2.4	5.9	6.3	6.3
World Total	118.1	49.9	107.1	134.6	159.8
Ex. U.S.A.	61.7	36.2	78.8	86.9	99.6
Ex. British	106.1	6.4	93.0	117.3	141.3
Brit. Empire	12.0	43.5	14.1	17.3	18.5

Steel production in the United States in 1940 increased 25% over 1939, to 59,806,000 long tons. To the end of Nov. 1941 the total was 67,469,000 tons, and the full year was expected to reach about 74,000,000 tons, or 97.4% of capacity. The annual plant capacity at the end of the year was 78,497,000 tons, against 70,210,000 tons on Jan. 1; capacity by June 30, 1942 was expected to be 79,769,000 tons, and later additions would bring this to 83,813,000 tons.

As with pig iron, imports of steel were comparatively small, but exports were larger, and increasing. Exports of all types of steel except scrap in 1940 rose to 7,192,500 tons, as compared with 2,315,000 tons in 1939, but at the same time scrap exports declined from 3,577,400 tons in 1939 to 2,823,100 tons in 1940. There was a greater decline for scrap in 1941, the total for the first three quarters being only 611,664 tons, and in the same period exports of steel had also declined to a rate of 5,700,000 tons for the year.

Scrap consumption in 1941 in the United States was estimated to have been close to 53,000,000 long tons, of which 55% was plant scrap and 45% purchased scrap. The supply of plant scrap would automatically be increased as ingot production increased, but difficulty was being encountered in maintaining an adequate supply of purchased scrap. Requirements were about 24,000,000 tons in 1941, but supply was not able to keep up with demand and toward the latter part of the year the scrap content of the charge was being decreased. The increases planned in ingot capacity would require an increase of 15% in purchased scrap to maintain the normal scrap content of the charge, and it was doubtful if this could be accomplished.

Canadian steel production to the end of Oct. 1941 was 1,971,000 long tons, a rate equivalent to 2,500,000 tons for the year, against 2,012,000 tons in 1940. (*See* also BUSINESS REVIEW: *Industrial Groups;* METALLURGY.)

(G. A. Ro.)

Iron and Steel Institute, American: *see* AMERICAN IRON AND STEEL INSTITUTE.

Iron Lung: *see* INFANTILE PARALYSIS.

Irrigation. Preliminary figures only were available from the 1940 U.S. federal census to indicate the status of irrigation development in the 19 western states (including Arkansas and Louisiana). On their face they appeared to indicate a recession during the 1930–40 decade, since only 17,912,777 ac. were reported irrigated by all agencies in 1939 as compared with 19,547,544 ac. in 1929. However, the loss was in pasture and other acreages from which crops were not harvested. A comparison of the acreages of irrigated cropland harvested discloses a net increase of between 400,000 and 500,000 ac., notwithstanding the much more exuberant economic conditions in 1929 than in 1939.

This analysis appeared to reflect the limited but not insignificant success of the general effort to improve and stabilize the irrigation supplies of areas already farmed, rather than to reclaim new land. While, as set out in later paragraphs, the U.S. government carried out a number of spectacular construction projects from 1932–41, their generally most important function was the storage of flood flow waters to benefit lands previously dependent upon normal flow and subject to late summer shortages in years of subnormal supply. Thus the higher pasture acreage previously reported included areas flooded only when the water was available. In a strictly economic sense its importance was far less than that of the irrigated cropland harvested.

The 1940 irrigation census included the state of Florida, irrigation statistics for which had not been collected previously. Florida totals were not included in the figures cited above. However, the irrigated acreage reported far exceeded that of several of the western states. Irrigated cropland harvested in 1939 was 123,682 ac., and irrigated pasture 2,509 ac.—a total of 126,191 ac. The irrigated acreages reported by several other eastern states, while far less than that reported by Florida, and mainly disclosive of truck-farm operations, were larger than had been realized. They probably reflected the effects of several years of drought during the decade, which induced specialty farmers to ensure their high-priced crops by the installation of pumping plants or by resort to other means of protection in abnormally dry periods. (*See* also DROUGHT.)

When the snow season of 1941 drew to a close early in the spring, the federal irrigation water supply forecasts for the semiarid areas of western United States predicted a moderate to severe water shortage for all the irrigated areas lying north of a line cutting diagonally northwest to southeast through Oregon and thence eastward across northern Nevada, Utah and Colorado. The mountain snow pack upon which these forecasts were based and which usually supplies most of the water during the growing season, was less than usual northward from this line and greater than usual to the south of it. This usually reliable indicator proved somewhat inaccurate, owing to above-normal late spring and summer precipitation in the areas where a water shortage might have occurred. Approximately a 20% deficiency of irrigation water occurred in cultivated areas on the east face of the Cascade mountains in Washington and Oregon, but elsewhere there was little or no shortage because rainfall lessened the need to irrigate. Abundant irrigation water supply was forecast for Arizona, California, southern Nevada and New Mexico, and these forecasts were fully borne out. Storage reservoirs of the west contained more water at the opening of the irrigation season of 1941 than for any season for many years. The 73 reservoirs in operation on federal reclamation projects in 15 western states contained 41,500,000 ac.-ft. The largest of these reservoirs is Lake Mead, behind Boulder dam on the Colorado river. All five of the reservoirs on the Salt river project in Arizona spilled for the first time.

As for the past several years, federal irrigation projects continued to predominate in construction and expansion programs. During 1941 projects constructed by the bureau of reclamation were prepared to irrigate 4,168,168 ac.—the largest area since that bureau began operating in 1902, representing an increase of 278,628 ac. over that reported for 1940. The area within projects receiving a full supply of water was increased about 50,000 ac. The largest part of the additional area was in the Payette division of the Boise project in Idaho. Facilities for supplying water to the Buffalo rapids project in Montana were available for the first time. The additional acreages receiving supplemental water supplies from storage projects were in the Upper Snake river project in Idaho, the Moon lake project in Utah, the Pine river project in Colorado and the Deschutes project in Oregon.

Under the construction program in progress, 2,370,000 ac. of raw desert land eventually would be brought into cultivation. The largest development in this long-range program was the Columbia basin project which ultimately would irrigate 1,200,000 ac. More than 3,800,000 ac. of land inadequately irrigated would receive more stable supplies through the facilities under construction. Through the water conservation and utilization program the area of 155,000 ac. to be benefited by projects under way would probably be more than doubled as new projects were added. When the comprehensive program was expected to be completed, water would be available for about 11,000,000 ac., more than half of which would be represented by supplemental service for areas which were inadequately irrigated. The bureau of reclamation estimated in 1941 that sufficient water was available in the west to irrigate 22,000,000 ac. in addition to the areas then irrigated, and provided supplemental supplies for 11,700,000 acres.

Work was in progress on 37 projects in 14 western states during the year 1941, continuing the major construction program undertaken by the bureau of reclamation in 1931, when work on the Boulder dam and power plant on the Colorado river in Arizona-Nevada, was started. Ten storage dams and seven diversion dams were under construction. Of these one storage and all seven diversion dams were completed. Those completed were the Crane Prairie, on the Deschutes project in Oregon; Dutch Slough dam on the Delta division of the Central valley project in California; the Entiat and Icicle creek dams nos. 1, 2, 3, 4 and 5, all small diversion dams constructed on the Columbia basin project in Washington, in connection with migratory fish control operations. The dams completed bring to 163 the total number of dams completed by the bureau of reclamation. The nine dams under construction at the end of 1941 were: Grand Coulee on the Columbia basin project in Washington; Shasta on the Central valley project in California; Friant, also on the Central valley project; Green Mountain on the Colorado-Big Thompson project in Colorado; Vallecito on the Pine river project in Colorado; Wickiup on the Deschutes project in Oregon; Marshall ford on the Colorado river project in Texas; Deer creek on the Provo river project in Utah; and Box butte on the Mirage flats project in Nebraska. (*See* also DAMS.)

Twenty-five federal reclamation projects in operation during the year 1941 directly supported approximately 1,000,000 people on irrigated farms and in near-by towns and cities. Supplemental water supplies were furnished to other farms with populations of 100,000. More than 50,000 family-size farm homes had been carved from the desert and as many more were to be provided by projects under construction to meet the growth in western population—twice the national average.

On the Imperial Irrigation district in California, federally aided but not a project of the bureau of reclamation, priming of the All-American canal was started in 1940 and continued through 1941, with service established to approximately 80% of the district lands, comprising about 522,000 ac. of irrigable land. It was contemplated that the All-American canal would furnish the entire water supply of the district by the early spring of 1942. As the priming of the canal progressed, there was a notable decrease in seepage losses throughout the new section. The two hydroelectric plants on the All-American canal were started in February and as the flow through the canal increased, these plants took over an increase in the amount of the district's power load until by late summer practically the entire load was thus served. Extension of the district's drainage system made rapid progress during the year, nearly 100 mi. of new drains having been constructed. As part of the All-American canal project, plans were carried forward during the year for the development of the east and west mesas. Preliminary surveys were completed for a distribution system to serve the first unit of approximately 30,000 acres.

Brazil.—Inspectoria Federal das Obres Contra as Seccas, which conducts the task of making productive and liveable a large section of Brazil, alternately visited by great floods and protracted droughts, has done excellent work in the northeastern states of Brazil. In this section aid to the semiarid areas was being carried out in 1941 in a program including the building of dams and the establishment of lines of communication. The construction of dams, which is the essential part of the plan to reduce the loss of crops by droughts, is the essential part of the campaign against droughts. Six separate developments were being accomplished, located in Ceará, the basins of the Acaráu and Jaguaribe rivers; in Rio Grande do Norte, the basins of the Apody and Baixo Piranhas rivers, and finally in

FORMER DESERT LAND of the Imperial valley, Calif., irrigated by the new All-American canal, produced an abundance of vegetables in 1941

Parahyba, the basin of the Alto Piranhas river. The development for the Acarau comprehends the construction of ten dams, six of which were already finished, the Forquilhas and the Jaibara being the two outstanding. In the Jaguaribe system, the most important of the developments, because of the greater number of dams in the project and under construction, the Lima Campos reservoirs with a storage of 58,300,000 cu.m.; Joaquim Tavora, with 24,000,000 cu.m.; Ema, with 10,400,000 cu.m.; Riacho do Sangue, with 68,200,000 cu.m.; Santo Antonio das Russas, with 24,000,000 cu.m.; Nova Floresta, with 7,600,000 cu.m. and Velame, with 2,500,000 cu.m. were already completed. With the completion of Orós project harnessing 4,000,000,000 cu.m., the system will have been completed. All these dams are within the territory of Ceará.

In the state of Rio Grande do Norte, the system of Baixo Piranhas is the most important, consisting of the following dams: Itaus, with 81,000,000 cu.m.; Cruzeta, with 29,700,000 cu.m.; Condado, with 35,000,000 cu.m.; Riacho dos Cavallos, with 17,700,000 cu.m.; and Santa Luzia do Sabugi, with 11,700,000 cu.m. capacity. The last three of these dams also comprise part of the system of the territory of Parahyba. The second system of Rio Grande do Norte is that of Apody, which has various dams already completed. Among these are Caráubas, storing 11,000,000 cu.m. of water and Lucrecia, storing 27,300,000 cubic metres.

The state of Parahyba has the Alto Piranhas system with the following dams completed: São Goncalo, with 44,600,000 cu.m. of storage; Pilões, with 13,000,000 cu.m. and Piranhas, with 355,000,000 cu.m. Under construction in 1941 was the Curema dam which was expected to store 720,000,000 cubic metres.

India.—It was estimated that the value of crops being raised in British India on areas receiving state aid in irrigation amounted to about Rs. 1,049,400,000 during 1941. From about 10,500,000 ac. in 1878–79, the area irrigated annually by state works alone in 1941 reached a total of 32,433,000 ac.—more than one-seventh of the total cultivated area in British India. It was also estimated that the capital outlay on irrigation and navigation works amounted to Rs. 1,502,800,000 and a gross annual revenue of more than Rs. 135,000,000. Of the provinces with major irrigation works the Punjab continued to lead in magnitude, involving an area of 12,292,000 ac. Madras ranked second in area with 7,565,000 ac., with United Provinces and Sind totalling about 5,000,000 ac. each. In percentage of area irrigated to the total area sown, however, Sind led with 89.1%, Punjab 38.8% and Madras 20.5%. As in previous years, Punjab yielded the largest return on capital invested in productive works with 14.99%, while Madras and United Provinces returned 6.36% and 5.3% respectively.

One of the works completed was the Kistna East Bank canal in Madras; it was planned to supply water for about 42,000 ac. on the mainland and 42,000 ac. on Divi island. In Bombay, the Nira Right Bank canal project was completed. The project included Lloyd dam at Bhatgar and a canal 106 mi. in length capable of irrigating about 132,000 acres.

Mexico.—In Mexico in the Delicias Irrigation district in Chihuahua, most of the canals and their appurtenant structures, necessary to irrigate about 12,500 ac., were completed during the year. In the Juarez Valley Irrigation district, also in Chihuahua, most of the canals, drains and structures were completed and the International dam on the Grande river was completed. In the state of Guanajuato, the Alto Lerma Irrigation district continued maintenance and improvement work with considerable progress on completion of the Salamanca canal.

In Sonora, on the Yaqui River Irrigation district the Angostura dam and its spillway were almost completed and in the state of Tamaulipas the Lower San Juan River Irrigation district carried on construction on the Azucar dam with the continuation of construction of the southern, northern and central dikes. The construction of dike no. 2, the spillway, southern outlet works, Main Rancherias canal and San Pedro canal was continued.

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(A. T. M.)

Islam. The war held up any active development during 1941 in the cultural relations among Islamic countries and to a minor extent any notable cultural development within the countries themselves. A good-will mission from the Azhar university in Cairo visited India, and return visits from India were planned, but had to be postponed.

The idea of Arab federation made some progress in that it obtained greater recognition and definition in the world at large and especially with the British and Allied governments. Though Egypt did not join the Saadabad pact, she took a lively interest in the Palestine problem. She pushed forward her internal reforms, administrative and economic. The improvement of her road communications with Palestine and sea communications through the Red sea would enable her to exercise a gradually increasing influence in the central lands of Islam.

The projected Kabul conference of Islamic states did not come about, on account of the disturbed condition of the world. But the delay in the formal meeting of Islamic powers did not mean that the cause of common Islamic understanding made no progress. It is true that the Syrian situation was the cause of some confusion. Syria was to have been emancipated from the French mandate and French control in 1939 and to have been recognized as a sovereign state and a member of the League of Nations in the session of the League assembly in the autumn of that year. But the instability of French politics upset all plans. The Syrian constitution had to be suspended; the Syrian parliament was dismissed; and dictatorial authority was established. The threat of German occupation, with its immediate dangers to Iraq, was met by the advance from the Mediterranean of British and Allied troops, in June 1941. Damascus was soon occupied, and Syria was free by the middle of July. Winston Churchill in his war review of Sept. 29, 1941, made it clear that the British policy, "to which our Free French allies have subscribed, is that Syria shall be handed back to the Syrians, who will assume at the earliest possible moment their independent sovereign rights." Syria and Lebanon were recognized by Great Britain and Free France as independent republics, the former in September and the latter in November 1941.

Indian Islam has for some time been discussing a scheme of mutual understanding among the Muslim provinces of northwest India. The Indian Muslim league gave its countenance to the ideal of Pakistan, which aims at joining together Sind, Punjab, the Northwest frontier province, Kashmir and Afghanistan so as to constitute a Muslim bloc. Kashmir is a feudatory state bordering on British India: its population is mainly Muslim, while its ruler is a Hindu. Afghanistan is an independent country. Sind, Punjab, and the frontier province are provinces of British India. How far it will be practicable to join these three categories of territories in any common scheme of administration time alone can show. (A. Y. A.)

Isle of Man: *see* BRITISH EMPIRE.

Isotopes: *see* PHYSICS.

Italian Colonial Empire. The table on page 368 gives essential information relating to the Italian colonial empire. Total area including Italy 1,167,728 sq.mi.; total population 48,406,000.

History.—Civilian activities ceased in the Italian colonial empire when Italy embarked on hostilities in June 1940 and had not been resumed by the end of 1941. Every part of the colonial empire had a theatre of war. The new bloc, known since 1936 as "Italian East Africa," was taken from Italy by British imperial forces. In Eritrea, Italy's oldest colony, Cheren was captured March 27, 1941, and on March 31 Asmara, the capital, capitulated. Italian Somaliland was invaded, mainly by troops from South Africa and India, at the end of January; Kismayu was taken in mid-February; Mogadishu a fortnight later, and before the end of March all resistance was over. In Abyssinia opposition was more sustained, but in January the Emperor Haile Selassie was able to cross his frontier at the head of his own levies, and on April 5 South African troops entered Addis Ababa after the most rapid military advance in modern history. Though guerrilla warfare and "mopping-up operations" continued until the fall of Gondar Nov. 27, the surrender of the duke of Aosta at Amba Alagi on May 20 marked the end both of organized Italian resistance and the five years' occupation of Ethiopia. One of the most important consequences of the British capture of Italian East Africa was the opening by President Roosevelt of the Red sea to U.S. shipping.

Albania and most of Libya were still in the hands of the axis powers at the end of 1941, though the British launched their

Italian Colonial Empire

Country and Area Square miles (approx.)	Population (000's omitted) (1938)	Capital, Status	Principal Products (1938) (in metric tons)	Imports and Exports 1938 (in lire, 000's omitted)	Road, Rail and Shipping 1938	Revenue and Expenditure (in lire, 000's omitted)
EUROPE						
ALBANIA, 10,632	1,057	Tirana; annexed kingdom.	maize 141,300 wheat 37,900	imp. 22,979† exp. 9,749 †	rds. motor about 1,380 mi.	rev. and exp. 40,000‡
AFRICA						
Italian provinces of LIBYA, 213,821	751*	Tripoli; included in the national territory of Italy.	(1939) barley 22,600 wheat 20,700	imp. 882,057 exp. 108,961	rds. 3,250 mi. rly. 271 mi. shpg.: passengers arrived 127,458 departed 122,521	(est. 1939–40) rev. and exp. 600,115
LIBYAN SAHARA, 465,362	18	Homs; colony, under military authority.				
ERITREA, 86,166	1,000	Asmara; colony, under British occupation.	barley (1937) 19,000	No separate figures	rly. 215 mi.	No separate figures
SOMALILAND, ITALIAN, 270,972	1,300	Mogadishu; colony, under British occupation.	maize 25,000	No separate figures	rly. 70 mi.	No separate figures
ASIA						
Italian Islands of the Aegean sea, 1,035	141	Rhodes; colony	barley 2,400; olive oil 617; wine 27,000 hectolitres	imp. 157,421 exp. 21,851	rds. 382 mi.	(1934–35) rev. and exp. 48,000

*Libyan population census 1936, Italians excepted, the latter being approximately 150,000. †In gold francs. ‡In gold francs, est. April 1, 1939 to June 30, 1940 (=15 months).

second offensive against the latter Nov. 18 and captured large areas west of the Egyptian frontier. During 1941 Italy added to her territorial possessions by the annexation in April of large tracts of Yugoslavia, including the greater part of Slovenia (the rest having been taken by Germany) with a population of 1,250,000, the coast of Dalmatia, with its ports and islands, and part of Montenegro. (*See* also ETHIOPIA; WORLD WAR II.) (L. H. D.)

Italian East Africa: *see* ITALIAN COLONIAL EMPIRE.

Italian Literature. The war, by virtually suspending communication between Italy and the American continent, arrested the flow of books and of magazines. Any survey of the literary production of Italy for 1941 must of necessity be limited to the first quarter of the year and be based on restricted material.

A distinction should be established between the plethora of aulic writers vegetating on the margin of literary life and the sound literary output which remains true to the high standards of Italian writing and scholarship. The former endeavoured to depict anti-Gallic Machiavellis, Manzonis and Vergas, continued with sadistic pleasure their anti-French crusade, shed tears of ink on the sad state of those Italian populations living in the Ticino canton, Corsica and French Morocco, and ransacked Dr. Goebbels' pamphlets for arguments in order to hammer into the minds of the recalcitrant Italians that Semitism and Anglo-American plutocracy are responsible for their plight. In an effort to divert the Italians from conditions at home, fascist writers of no repute cluttered the market with books on the oil fields, coal mines and rich colonies of the United Nations which would soon belong to the victorious axis.

Fascist editors issued strong appeals to the Italian writers to organize and make ready for the gigantic mission which would be theirs in the postwar world, when fascist and nazi cultures, spreading over all of Europe, U.S.S.R., the far east and the two Americas, would provide them not with 28,000,000 Italian readers but with hundreds of millions of persons.

However, a careful study of the books published revealed that the majority of Italian writers and publishers had not been carried away by this mirage of the fascist future, and tried to produce and publish works of a serious nature.

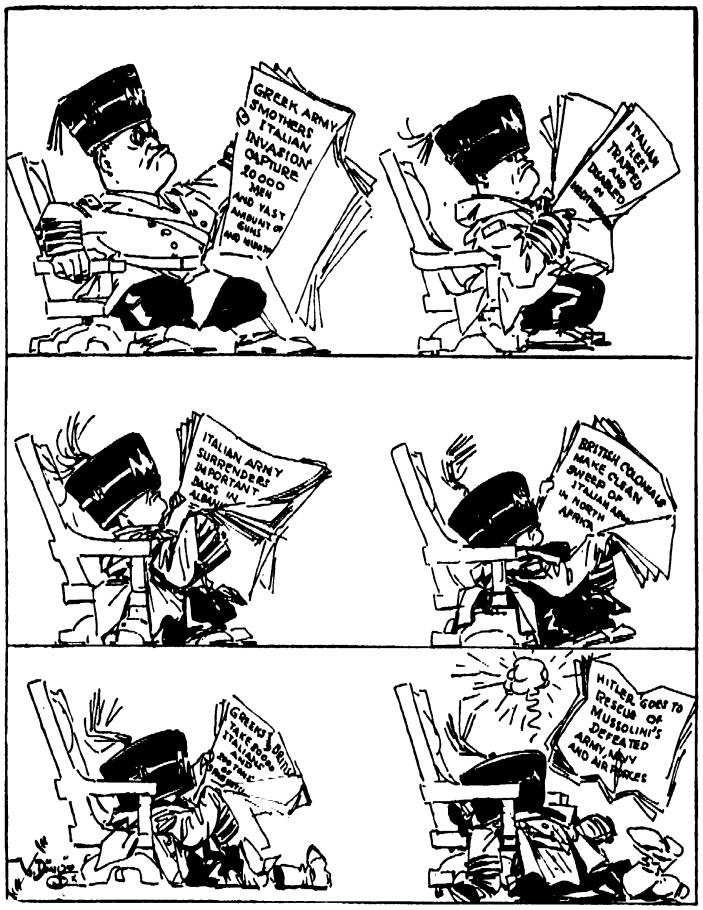
The most important contributions seem to have been made in the fields of history, philosophy and literary criticism. D. Scioscioli published the first part of *Il Dramma del Risorgimento sulle vie dell'esilio* (Signorelli), containing profiles, plots and hitherto secret material garnered from unedited documents relating to F. Buonarroti, F. Confalonieri, V. Gioberti, G. Berchet and other exiles who lived in Belgium between 1930 and 1940. An interesting history of 19th century life through its costumes and styles was provided by R. Carrieri in his *Immagini di moda, 1800–1900* (Domus). Several long series on Rome, its emperors, and on great Italians of the past, recalling Italy's imposing historical heritage, were regularly published by U.T.E.T. and the Istituto di Studi Romani. The 40th anniversary of Verdi's death was marked by numerous studies on the composer's life and art, the most notable among which are G. Roncaglia's *L'ascensione creatrice di G. Verdi* (Sansoni), G. Bongiovanni's *Dal carteggio inedito Verdi-Vigna* (Giornale d'Italia), *Autobiografia dalle lettere* (Mondadori) and A. Lancellotti's *G. Verdi 1813–1901* (Palombi). Important in the field of philosophy are *Il Pensiero di Giordano Bruno* (Sansoni) and *La formazione della filosofia politica di B. Croce* (Einaudi) by the promising young scholar, A. Mautino, who died at the age of 21. E. P. Lamanna added a second volume to his history of philosophy (Le Monnier) and G. De Ruggero his third (Laterza), which goes from Vico to Kant. Of considerable interest to students of G. B. Vico's personality are his *Versi d'occasione e scritti di scuola* (Laterza).

Dante criticism was further enriched by M. Barbi's two new works, *Con Dante e coi suoi interpreti* (Le Monnier) and *Problemi di critica dantesca* (Sansoni). The numerous celebrations of the centenary of Verga's birth throughout Italy and the many valuable works written for the occasion and which continued to appear in 1941 testified to the great Sicilian novelist's unabating popularity. M. Cappellani's *Vita di G. Verga* (Le Monnier) and E. De Michelis' *L'arte del Verga* (La Nuova Italia) deserve special mention.

Two writers who made a place for themselves in contemporary Italian letters were C. Alvaro whose new volume of short stories, *Incontri d'amore* (Bompiani), contains excellent allegorical and symbolic visions of his youth, and B. Tecchi, whose novel *Giovani amici,* received high praise for its fine psychological study of the development of two young boys. The others, Samminiatelli, Cecchi, Mura, Moscardelli and Gotta, continued in tried and true paths to appeal to their faithful clientele of readers. (M. F. C.)

Italian Somaliland: *see* ITALIAN COLONIAL EMPIRE.

Italy. A kingdom consisting mainly of the peninsula projecting south into the Mediterranean from the mass of central Europe. The land boundaries, which reach as far north as



"THE SHRINKING VIOLET OF ITALY," by Darling of the *New York Herald Tribune*

46°40′, are formed by France, Switzerland, Germany and Yugoslavia. Capital, Rome. Ruler: King Victor Emmanuel III; chief of government (il duce): Benito Mussolini (*q.v.*). National flag: green, white and red in vertical stripes, with the arms in the white stripe.

Area and Population.—Excluding Libya: area, 119,764 sq.mi.; pop. est. (Jan. 1, 1940), 44,815,000. Chief cities (pop. 1936): Rome (1,155,722), Milan (1,115,848), Naples (865,913), Genoa (634,646), Turin (629,115). Language, Italian; religion, Roman Catholic.

History.—The year 1941, the year XX of the fascist era, was a sad one for Italy. In January her troops in Libya were in full retreat; by December's end they had either surrendered or were in thorough rout, and the loss of the entire province seemed imminent. And as the year closed, Italian resistance in Ethiopia was at an end, and Italian regiments drafted for the nazi invasion of the U.S.S.R. were being terribly mauled both by the Red armies and by the Russian winter. The Italian flag, it is true, hung over the Parthenon at Athens; Albania as an Italian province had been enlarged in area; and a cousin of the king of Italy had become ruler of the puppet state of Croatia (*q.v.*); but in every instance it was not Italy but nazi Germany that had made possible these successes. The tinsel trappings of victory might be wrapped around Mussolini, but the reality that lay behind was the German Wehrmacht, as ruthlessly determined to make Italy toe the mark as to bring Vichy France to heel.

During the winter of 1940–41 bitter storms and heavy snowfall made it possible to keep the advancing Greeks at bay in the Albanian mountains; but in Africa during January and February there was no news but of disaster. On Jan. 5, the Libyan seaport of Bardia surrendered, the British capturing 25,000 Italian troops; and on Jan. 22, Tobruk, a larger seaport to the west, capitulated, the British bagging 14,000 additional Italians. And still the fascist retreat in eastern Libya continued. Falling back to their main base at Bengasi, the Italians tried hard to stem the tide. But the British army of the Nile, a small force of Britons, Australians, New Zealanders and Indians, was not to be denied. On Feb. 6, Bengasi fell; and of Italy's North African army of 280,000, little more than one-third remained. Meanwhile, during February, the British drove into Italian Somaliland and Eritrea, thus compelling the harassed foe to withdraw hastily from the outposts they had conquered in the Sudan to defend Ethiopia (*q.v.*). The British followed hard at their heels, arming as they did so the followers of Haile Selassie. By the middle of March, the British had penetrated some 100 mi. into Ethiopia, capturing the important city of Harar on the railroad line to Addis Ababa.

The history of Italy as an African power, and perhaps as a naval power too, seemed about ended. The exploits of the royal navy in Nov. 1940 now were duplicated. On March 28, one Italian battleship, three heavy cruisers and two destroyers were sunk or damaged in the battle of Matapan, off the southern tip of Greece. On both land and sea the Italians seemingly were routed.

With the coming of the spring, the nazis dashed to the help of Italy. German troops arrived in Libya, some by air transport, some by troop ships and some, presumably, through French Tunisia. Simultaneously the nazis concentrated their troops on the Greek border, and the British were pledged to do their best to assist the Greeks. The British kept their word, transferred the bulk of the army of the Nile from Libya to Athens and Salonika, and retained but a skeleton rear guard in Libya.

Once again in North Africa the way was open for the axis. The 100,000 Germans, equipped with tanks, planes, plus what remained of the Italian army, counterattacked successfully. On April 3, the British evacuated Bengasi in swift retreat; on April 8 they were by-passed at Tobruk by the advancing Germans, supposedly assisted by their Italian allies. Five days later Bardia fell to the axis, and by the middle of April Germans and Italians were over the border in Egypt. Here their offense stopped, partly because of the weather, partly because of the necessity of first conquering the besieged British garrison at Tobruk on their flank before advancing toward Alexandria.

Some reflected glory fell to Italy as the result of this April campaign in Libya, but none at all could be credited to Italian arms in the Balkans in this same month in April. Within a few days, in that difficult terrain, the nazis forced their way through southern Yugoslavia, joining hands with their sluggish fascist allies on April 11 in Albania. Ten days later the Greeks in the Epirus and Macedonia, realizing their helplessness, surrendered to the Germans. Mussolini, fearful of his prestige, did not announce this fact to his people. Ordering his own troops to advance, he lost 6,000 additional soldiers in an attack on the Greeks. Two days later the Greeks surrendered all over again, this time to the Italians—the result, a triumph, of a sort, for the duce.

The Italians staged another triumph of like character on the small island of Corfu. They raced thither in order to outspeed their nazi allies; but the islanders resisted the Italian bombardment bravely, preferring to surrender to the Germans. The latter, however, were unwilling to accept Corfu since the Italians did arrive first, and so the Italian tricolour rather than the swastika waved over Corfu. Finally the troops of Mussolini made a third conquest, the city of Ljubljana, within the borders of Slovenia, the Slovenes making no resistance.

With Italy's contribution to the conquest of the Balkans so slight, it is surprising that the Germans presented her with as much booty as they did. The Germans, of course, had a good deal to give away—all of Yugoslavia and all of Greece. A considerable part of the former was presented to Bulgaria, a larger slice

(Slovenia) was reserved for Germany, and to Italy went a bit of Yugoslavia north of Albania and certain islands in the Adriatic. Certain Greek territory was likewise added to Albania, and the Italians were authorized to police a part of conquered Greece. Germany, furthermore, having no immediate urge to annex Croatia, and having promised the Croats their independence, suggested an Italian duke as the new king of Croatia.

These settlements would have given Italy more than the proverbial jackal's fraction if the policing of Greece meant further booty. But the Germans had no intention of leaving any booty there for the Italians; instead they looted Greece in most thorough fashion first, removing everything of any value that could be moved, consuming everything that could be drunk or eaten. Only after that were the Italians invited in. And even so they were not given full authority. Many Germans stayed behind in key positions, to give orders not simply to conquered Greeks but also to conquering Italians. But Mussolini made the most of it. On June 10, the anniversary of Italy's entrance into the war, he announced, "It is absolutely mathematical that in April, even if nothing had happened to change the Balkan situation, the Italian army would have overcome and annihilated the Greek army."

The second half of the year was one of increasing unpleasantness in Italy. One disturbing factor was the large number of Germans within the country. How many were stationed there is unknown, but they were numerous and held key positions. Furthermore, they bought lavishly in depreciated currency just at a time when the Italians began to feel keenly the lack of consumers' goods. By autumn, almost everything sold was rationed. One could buy either a suit of clothes or a pair of shoes, but not both. There were severe restrictions on foodstuffs. The scarcity of coal was so great that the use of it was forbidden in northern Italy until Dec. 1, and in southern Italy until Dec. 15. U.S. cigarettes were reported as selling at $4 a pack. Within the ranks of the fascist party there were misgivings. The Italians had not forgotten the advice of Machiavelli that one can strengthen political movements by "a return to their origins." In its origin Italian fascism had been an anti-rich agitation. Now within the bosom of the party there were renewed stirrings against the wealthy. This the duce apparently took note of, for in the autumn there was a shake-up in the fascist ranks, many old leaders being demoted, and new ones appointed.

The news from Africa continued bad. The Italian-German invasion of Egypt made no headway, and the Italian-German forces were unable to dislodge the British from Tobruk. In Ethiopia Haile Selassie was back on his throne. The remaining Italian garrisons in Ethiopia escaping north had no place to go after meeting their fellow nationals retreating south from Eritrea before the advancing British. There could be no hope whatever of their ultimate rescue. The Duke of Aosta, Italian viceroy in Ethiopia, formally surrendered that colony to the British as early as May, but despite that fall, many garrisons fought on. Particularly vicious and protracted was the fight for Gondar, Italy's last outpost in Ethiopia. The Italians here proved that they could fight and fight well if they wanted to. Gondar is a fertile plateau in northern Ethiopia, only to be reached by steep and winding trails. On this plateau some 15,000 Italian troops found sanctuary and withstood a siege of seven months, thus vying with the beleaguered British at Tobruk in all that concerns hardihood and endurance. They made of the plateau a strong fortress, surrounded by barbed thorns in lieu of barbed wire. From every side the imperial forces drew in on Gondar, bombing it mercilessly from the air. Italian ammunition ran low. One battalion without ammunition charged with the bayonet, until almost all had died. Then, on Nov. 27, Gondar surrendered. All Ethiopia was now cleared of Italian troops except possibly for a lost patrol of 50 men who, according to rumour, were in the northeastern part of that country, hiding in caves but with a radio to keep in touch with Italy.

In November and December the Italians received their worst drubbing in the war, this time in conjunction with their nazi allies. The British army, at last well equipped with planes and tanks largely U.S. in origin, drove back the Italo-German forces in eastern Libya, even farther than they had driven them in January and February. This time the fighting in the desert was more ferocious than before. A great part of it was done by charging tanks which thrust at one another like prehistoric monsters. The campaign was carefully prepared; the British cut deep into the desert and drove due west in hopes of encircling the enemy. Contact with the besieged garrison at Tobruk was made, only to be lost and won again. The Italians and Germans in Bardia and in Halfaya ("Hell Fire") pass in western Egypt were cut off from their comrades, who fled westward toward Bengasi. Bardia fell once more to the British Jan. 2, 1942.

This time the British excelled their record of the previous February, for they not only captured Bengasi for a second time, but by the end of the year had penetrated 93 mi. south of it to Agedabia.

Here the axis armies stood at bay as the year ended.

Education.—Public elementary schools in 1937–38, 131,580; pupils, 5,411,596. Students in secondary schools, 647,505; in universities, 77,429. A special school charter of 1939 required all education in Italy to have a fascist stamp.

Defense.—In 1939 (estimated): army, 900,000; planes, 5,500; battleships, 6; cruisers, 22; destroyers, 61; torpedo boats, 71; submarines, 105.

Finance.—Estimates for year ending June 30, 1940: revenue, 24,560,000,000 lire; expenditure, 29,316,000,000 lire. Lira quoted Dec. 1939 at 5 cents; in June 1941, 5.262 cents.

Trade and Communication.—In 1939: imports, 11,061,000,000 lire; exports, 8,007,000,000 lire. Railway, 29,220 km. Shipping: 2,301 sailing vessels, 1,057 steamships, 293 motorships. Total over 2,000,000 metric tons.

Agriculture, Manufacture and Minerals.—Livestock in 1938: horses, 791,120; asses, 791,390; mules, 431,150; cattle, 7,666,890; pigs, 2,940,440; sheep, 9,467,400; goats, 1,828,070. In thousand quintals: wheat, 12,420,000; maize, 3,724,000; beans, 1,625,000; olives, 2,038,000.

Most important industry, textiles, with 938 factories in 1938. In minerals, sulphur continued to lead, there being mined, in 1938, 2,363,000 metric tons, to 930,000 tons of iron pyrites, next competing mineral. (*See* also ALBANIA; ANTI-SEMITISM; ARMIES OF THE WORLD; BRAZIL; GERMANY; GREAT BRITAIN AND NORTHERN IRELAND; GREECE; ITALIAN COLONIAL EMPIRE; NAVIES OF THE WORLD; UNITED STATES; WORLD WAR II; YOUTH MOVEMENTS.)

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Ivory Coast: *see* FRENCH COLONIAL EMPIRE.

Jackson, Robert Houghwout (1892–), U.S. jurist, was born Feb. 13 at Spring Creek, Pa. Following his graduation from Albany law school he was admitted to the New York bar in 1913 and practised law in Jamestown, N.Y. As counsel and in official capacities he served various railroad, banking and telephone interests. In 1918 he became corporation counsel for Jamestown. The year 1934 found him in Washington, D.C. as general counsel for the bureau of internal revenue, By appointment of President Roosevelt he served as U.S. assistant attorney-general during 1936–38. In 1938–39 he was solicitor-general of the United States. In Jan. 1940 President Roosevelt appointed him U.S. attorney-general and on June 12, 1941 he was made associate justice of the U.S. supreme court.

Jamaica: *see* WEST INDIES, BRITISH.

James, Arthur Curtiss (1867–1941), U.S. railroad executive, was born June 1 in New York city, the heir to a vast fortune founded by his grandfather

in mining operations and expanded by his father in the railroad industry. After taking an M.A. degree at Amherst college in 1889, he worked as a mail clerk in his father's corporation. His first experience in railroading was in managing the St. Paul & Pacific, which expanded into the Great Northern. In 1901 the Chicago, Burlington & Quincy was added to the James' railroad empire and in 1926 he acquired the Western Pacific, joining it to the Northern Pacific, and thus controlled a trunk system stretching from Chicago to California. When his father died in 1907, James inherited a $26,000,000 fortune in copper, gold and silver as well as railroad holdings. When he retired in 1939 he was considered one of the 12 wealthiest men in the United States and the largest individual holder of railroad shares. He died in New York city, June 4.

James Tait Black Memorial Prizes: *see* LITERARY PRIZES: *Great Britain.*

Japan. An empire; capital, Tokyo (*q.v.*); ruler, Emperor Hirohito; premier at the end of 1941, Gen. Hideki Tojo. A chain of islands in the western Pacific, stretching from South Sakhalin (50° latitude) to the South Seas mandated islands, which extend over a great expanse of the Pacific, some of them being located near the equator; includes Chosen (*q.v.*), on the mainland of Asia, and the small Kwantung leased territory, with the city of Dairen, on the Liaotung peninsula. Japan proper consists of four large islands, Honshu, Hokkaido, Shikoku and Kyushu, with many adjacent smaller islands. Chosen, Formosa (*q.v.*) and Sakhalin are administered as colonies, along with the South Seas islands, former German possessions, which were granted to Japan under a mandate from the League of Nations after World War I. The total area of the Japanese empire in 1941 was 263,359 sq.mi., of which Japan proper constituted 148,756 sq.mi. Population of the empire (census of 1935) was 97,697,555; of Japan proper 69,254,148. An estimate of the Cabinet Statistics bureau placed the population of the empire at 103,087,100 on Dec. 1, 1937. The same organization estimated the population of Japan proper at 72,875,800, as of Oct. 1, 1939, an increase of 653,100 over 1938.

History.—Far and away the overshadowing event in Japanese history during 1941 was the launching of war against two great western powers, the United States and Great Britain, by means of surprise attacks on the large U.S. naval base at Pearl Harbor, Hawaii, on the Philippine Islands and on British far eastern possessions. The attack on Pearl Harbor was in the form of an air raid at dawn on Dec. 7 and was accompanied by declarations of war against both the United States and the British empire. On the following day the U.S. congress, following President Roosevelt's recommendation, voted for a declaration of war against Japan.

Japan enjoyed the advantage of surprise and careful preparation, and the first few weeks of the war were marked by an almost uninterrupted series of military successes. The raid on Pearl Harbor, as audacious as it was treacherous, led to the sinking of one battleship, the "Arizona," the capsizing of another, the "Oklahoma," the sinking of three destroyers, a minelayer and an old target ship, the "Utah," and the crippling of an unspecified number of vessels. A considerable number of U.S. planes, including many new bombers, were also destroyed.

After striking this hard blow at the main U.S. naval force in the Pacific, Japan turned against the principal British and U.S. outposts in the orient. Hongkong, the picturesque rock which was also one of the world's greatest ports and which had been a British crown colony for a century, fell on Dec. 25, 1941. The gallant last stand of the British and Canadian garrison on the rocky fastnesses of the island was shortened by the destruction of sources of water supply.

The international settlement at Shanghai, from which the last detachment of U.S. marines had been withdrawn, was taken over without resistance, and the same fate befell the foreign concessions at Tientsin. After preliminary landings in small force and bombing attacks which destroyed a considerable number of U.S. planes, the Japanese landed in force in Lingayen bay and in some areas south of Manila and initiated a pincer movement against the Philippine capital.

KICHISABURO NOMURA (left), Japanese ambassador to the U.S.A., greeted Saburo Kurusu, special envoy from Tokyo, as the latter arrived at Washington, D.C., Nov. 15, 1941, to begin his so-called "peace talks" with U.S. government officials

The commander in chief of the U.S. and Filipino forces, General Douglas MacArthur (*q.v.*), proclaimed Manila an open city and transferred military and naval equipment and installations elsewhere, but the Philippine capital was severely bombed on Dec. 27. It was occupied by the Japanese Jan. 2, 1942, and President Manuel Quezon's secretary, Jorge Vargas, was installed as mayor. President Quezon himself apparently remained loyal to the U.S. connection. General MacArthur withdrew his main forces into the rugged Bataan peninsula, north of Manila; and the island stronghold of Corregidor, commanding the entrance of the Bay of Manila, held out against repeated Japanese bombing attacks. The Japanese effected a landing in force at Davao, on the southern side of Mindanao. Most of the 20,000 Japanese in the Philippine archipelago live in the Davao region, where they are largely engaged in raising hemp.

Two small island outposts of the United States in the western Pacific, Guam and Wake (*qq.v.*), were occupied by the Japanese. Guam, which is surrounded by Japanese mandated islands, fell after a few days; Wake, with its small garrison of some 400 marines, held out gallantly and inflicted considerable losses on the Japanese attacking forces in ships and planes before it finally succumbed to superior strength.

The Campaign in Malaya.—More important, from the standpoint of the general strategy of the war, than the seizure of Hongkong and the Philippines was the Japanese drive into the elongated Malay peninsula, with the great British naval base of Singapore (*q.v.*), located on an island at the tip of the peninsula, as their obvious objective. Malaya is, with the Dutch East Indies, one of the world's two main sources of tin and rubber, and Singapore was built as a main bastion of defense for Australia and New Zealand to the southeast and for India to the west.

Thailand fell after a very feeble show of resistance; Japanese propaganda had long been active among the younger Thai military and naval officers. The Japanese succeeded in sinking Great Britain's two capital ships, the "Prince of Wales" and the "Repulse," in far eastern waters in the first week of the war. Exploiting air and naval superiority, they advanced more than 400 mi. during the first few weeks of the war, pressing down both sides of the Malay peninsula and occupying Penang, second city of the Straits Settlements after Singapore. By Jan. 10, 1942, they were on the outskirts of Kuala Lumpur, capital of the Federated Malay States and less than 200 mi. from Singapore. One method of advance was to utilize shipping and constantly effect landings in the rear of the defending forces. While the number of Japanese forces engaged in the invasion of Malaya was generally estimated at about four divisions, the British and Australian forces which were resisting the advance were very substantially outnumbered.

The Netherlands Indies was included in the new area of hostilities, and a number of sinkings of Japanese warships and transports by Dutch submarines was reported. The Japanese carried out a number of air attacks on Dutch islands and effected landings in some force on North Borneo, occupying the British protectorate of Sarawak.

(*See* WORLD WAR II.)

Prelude to War.—While the Japanese attack was sudden and unannounced, the war began as the climax of a long period of increasing strain and tension in Japanese relations with the United States and Great Britain. There had long been an irreconcilable conflict of view about the status of China, and Japan's close association with the axis powers under the tripartite pact of Sept. 27, 1940, added another element of friction.

Shortly after the beginning of the German-Russian war Japan, most probably with German diplomatic co-operation, obtained an agreement with the Vichy regime which provided for the movement of French troops into southern Indo-China and the establishment of air and naval bases there. (The Japanese had occupied northern Indo-China in the autumn of 1940.)

The United States, acting in close co-operation with the British and Netherlands governments, replied to this Japanese move into southern Indo-China by freezing all Japanese assets and virtually stopping all trade with the island empire on July 25, 1941. Japan on Aug. 4 suspended shipping to the United States. As Japan was cut off by blockade and by the German-Russian war from any contact with Europe, the concerted action against its foreign trade was a severe blow to its economy, which was forced to carry on with what resources were available in the regions of East Asia under Japanese control and with accumulated stockpiles.

Premier Prince Konoye (*q.v.*) on Aug. 28 suggested to President Roosevelt a resumption of diplomatic discussions with a view to breaking the deadlock. Early in November, after Konoye had been replaced by General Hideki Tojo (*q.v.*), a veteran Japanese diplomat, Saburo Kurusu (*q.v.*), was sent to Washington as a special envoy to carry on further discussions with the U.S. government.

There were several meetings between Kurusu and the Japanese ambassador, Admiral Kichisaburo Nomura, and President Roosevelt, Secretary of State Hull and other U.S. representatives. No full record of the negotiations had been made public at the close of 1941. There was reason to believe, however, that a compromise proposal was under consideration for a three months' "truce," during which time Japan would undertake to give some guarantees against further aggression, while the "freezing" restrictions would be relaxed. But the proposal was finally rejected because of strong protests on the part of the Chinese, who, together with the British, Dutch and Australians, were kept informed of the progress of the discussions.

Secretary Hull presented to the Japanese envoys on Nov. 26 a note which called for the withdrawal of all Japanese armed forces from China and Indo-China. The note also proposed the mutual withdrawal of trade restrictions, the unfreezing of assets and the conclusion of a multilateral nonaggression pact among Japan, the United States, China, the Netherlands, the soviet union and Thailand. The Japanese reply to this note, delivered on Dec. 7 just as the news of the attack on Pearl Harbor was arriving, rejected these proposals.

Japan in China.—There was no great change during 1941 in the comparatively static military and political situation which had prevailed in China after the more active period of the Japanese invasion ended in the autumn of 1938 with the capture of Hankow and Canton. The Japanese continued to bomb Chungking and other Chinese cities in the interior. The Chinese guerrillas harassed the areas which were under Japanese occupation. No large town or area changed hands except temporarily. At one time the Chinese pushed into Ichang, the town which represented the farthest point reached by the Japanese on the Yangtze river, but they were driven out again.

The Japanese made two more drives against Changsha, capital of Hunan province, one in September, the other after the outbreak of the war with England and the United States. In each case they reached the city, accomplished some destruction and withdrew. The Japanese interpretation was that these were successful punitive expeditions. The Chinese claimed notable victories. There was some Chinese pressure on the Japanese lines around Hongkong, but not enough to relieve the Crown Colony. The Chinese government formally declared war on Japan after the outbreak of war between Japan and the United States. (*See* also CHINESE-JAPANESE WAR.)

Japan and the Soviet Union.—The Japanese foreign minister, Yosuke Matsuoka (*q.v.*), on his return from a trip to Berlin and

Rome, signed a five-year nonaggression and neutrality pact with the soviet union on April 13, 1941. The pact was interpreted in some quarters as an agreement of mutual interest. It guaranteed Japan's rear in the event of a conflict in the south Pacific. It gave Stalin an assurance that he would not be attacked in the east if he should find himself involved in conflict with Hitler in the west.

At any rate the pact worked out thus in practice: Japan took no part in the German attack on the soviet union and even allowed some U.S. tankers to enter Vladivostok. And, when Japan threw its main resources into the drive toward the south, the soviet union, although intimately associated with Great Britain and the United States in the war against Germany, failed to fulfil the optimistic predictions of some observers who anticipated that soviet bombers over Japan's large cities and soviet submarines in Japanese waters would make an important contribution to the defeat of the island empire.

Internal Conditions.—For Japan, 1941 was a year of growing strain and tension, of more severe rationing and dislocation of normal trade, especially after the cessation of trade relations with the United States, the British empire and the Netherlands Indies, and of feverish secret preparation for the desperate adventure that began on Dec. 7. There were two shifts of cabinet, one on July 18, when Prince Fumimaro Konoye remained premier, merely reshuffling his ministers and dropping the foreign minister, Yosuke Matsuoka; the second on Oct. 18, when General Hideki Tojo, the former war minister, became premier. It is possible, although certainty on the point cannot be attained because of the lack of evidence, that the accession to power of Tojo, an intimate associate of two of the most powerful leaders of the Japanese military factions, Generals Toshizo Nishio and Seishiro Itagaki, marked the definite decision of Japan to strike with all its force.

There were several symptoms of preparation for a supreme crisis. A special session of the cabinet on July 12 decided on an extension of government control over finance, industry, production and distribution. The National Mobilization act of 1938, which gave the government unlimited power to draft men for industry and to appropriate plant and economic resources, was invoked on Aug. 11, 1941.

Education and Religion.—There were 48,637 schools of all types in Japan in 1938, with 15,638,780 pupils. Elementary education is compulsory for children between the ages of 6 and 14. The percentage of attendance was 99.59. There were 563 middle schools in Japan in 1938, with 364,486 pupils, and 45 universities, with 6,385 professors and 72,968 students. Shinto, the indigenous faith of Japan, possesses some characteristics of a state religion, since the performance of obeisance at national shrines is required of all Japanese. However, the authorities interpret this in a nationalist rather than in a religious sense, and the Japanese constitution provides for freedom of religion. In 1936 there were in Japan 41,127,307 Buddhists, divided into a number of sects, and 16,525,840 Shintoists. U.S. and British missionary work in Japan was terminated by the war. In 1938 there were 215,166 Japanese Christians of the Protestant faith, 111,856 Roman Catholics and 41,251 adherents of the Greek Orthodox church. A law on the control of religions, enforced after April 1, 1940, gave the authorities greater supervisory powers, and after its enactment there was a tendency for Japanese Christian groups to exclude any kind of foreign direction of their activities.

Defense.—The Japanese army is based on the principle of conscription, with liability to active service between the ages of 17 and 40. The army was obviously considerably expanded from its peacetime strength of less than 250,000 after the outbreak of the war with China in 1937. It was unofficially estimated that Japan in Dec. 1941 had about 1,800,000 men under arms from the Siberian border to the Malay peninsula, organized in 60–66 divisions.

The Japanese navy kept its strength secret after the expiration of the Washington treaty of naval limitation at the end of 1936. It was estimated that the minimum strength of the navy in Dec. 1941 was 10 battleships, 7 aircraft carriers, 44 cruisers, 126 destroyers and 69 submarines. It was reported that Japan had started the construction of four or even eight 45,000-ton battleships, and it was variously guessed that one, two or even three of these vessels were ready for service at the end of 1941. One of the older Japanese battleships, the "Haruna Maru," was reported sunk off the Philippines by the gallant action of the U.S. air officer, Captain Colin Kelly (*q.v.*). The Japanese did not officially admit the loss of this vessel.

Banking and Finance.—The unit of currency is the yen (pegged at a nominal value of 23.48 U.S. cents until the outbreak of the war). The value of the yen in the free exchange market at Shanghai was much lower; but any kind of exchange ceased after the beginning of hostilities. The Japanese have made a practice of paying their troops in military notes, the redemption value of which is doubtful, with a view to making occupied regions pay the cost of occupation. This practice was apparently followed in the Philippines, as well as in China. The Japanese budget of 1941–42 was fixed at 13,875,000,000 yen, of which 7,574,000,000 yen had to be borrowed. It was a budget of record size. The national debt, which was 10,578,000,000 yen in 1937, was 32,936,000,000 yen in 1941. The amount of currency in circulation was 1,865,703,385 yen at the end of 1936; it was 4,566,000,000 yen in Aug. 1941. It was estimated that Japan's national income in 1939 was 25,500,000,000 yen, of which 6,500,000,000 yen went for war and armament expenditures. The income for 1940 was 30,000,000,000 yen, of which 7,500,000,000 or 8,000,000,000 was devoted to war and armaments.

The Bank of Japan is the central bank of issue. The Yokohama Specie bank is in charge of foreign exchange transactions and finances foreign trade. Commercial banking is mainly in the hands of seven large banks: the Mitsui, Mitsubishi, Dai-ichi, Sumitomo, Yasuda, Daihyaku and Sanwa. Among the foreign banks which operated in Japan until the outbreak of war with the western powers were the National City bank of New York, the Hongkong and Shanghai Banking corporation, the Chartered Bank of India, Australia and China, the Nederlandsch-Indische Handelsbank.

Trade and Communication.—Information on Japanese foreign trade was officially withheld after 1940, so that the last available figures in 1941 were for 1939, when Japanese exports amounted to 3,932,926,000 yen and imports to 3,127,460,000 yen. During the first half of 1940 (when figures were still published) exports were 2,018,980,000 yen (an increase of 403,450,000 yen over the corresponding period in the previous year), and imports were 1,856,729,000 yen (an increase of 266,577,000 yen). A marked tendency in Japan's foreign trade for several years had been to develop a large surplus in trade with Manchoukuo and occupied China, with the result that there was a deficit in the balance of trade with countries outside the so-called yen *bloc*. There must have been a very drastic curtailment both of imports and of exports after the economic retaliatory measures which were applied by the United States, the British empire and the Netherlands Indies in July 1941. These measures cut off about 75% of Japan's normal imports; and there must have been a roughly similar diminution of exports. The United States shipped to Japan 27,994,624 barrels of oil in 1939 and 22,920,299 barrels in 1940. Japan's domestic production of oil is only about 7,000,000 barrels a year. The Japanese drive to the south was certainly partly designed to obtain by force what had been cut off in normal trade. The Netherlands Indies contain the only large oil deposits in the orient. Malaya and the Netherlands Indies are the world's largest producers of tin and rubber. The Philippines and the Netherlands Indies are rich in sugar; there is iron in Malaya and in the Philippines; and the latter islands contain considerable reserves of manganese and hemp.

There were 27,294 km. of state and private railways in Japan in 1938, a substantial increase over 1937, together with 5,206 km. in Chosen, 3,470 in Formosa and 342.9 in South Sakhalin. The number of registered ships in the Japanese empire on Sept. 30, 1938, was 4,842, with a gross tonnage of 5,339,632. The number of sailing ships was 17,791, the tonnage 1,046,476. Commercial aviation is centralized in the hands of a semigovernmental monopolistic company, the Japan Airways company, which was established in 1930 with a capitalization of 100,000,000 yen. The length of its routes in 1938–39 was about 10,000 mi. The number of flights was 17,144, the aggregate length of flights 6,209,873 km., the number of passengers carried 69,268, the quantity of goods conveyed 297,807 kg., the amount of mail 819,261 kg. The most important air routes in Japan are Tokyo-Dairen, Fukuoka-Taihoku, Tokyo-Sapporo, Tokyo-Hsinking, Tokyo-Peking, Fukuoka-Shanghai-Nanking, Tokyo-Bangkok and Tokyo-Palau (administrative centre of the South Sea islands). The three last named lines were opened in 1938 and 1939.

There were 13,648 telegraph stations in Japan proper in 1939, and 75,838,875 domestic and 1,261,295 foreign messages were handled in the year 1938–39. The length of the inland telegraph lines, 425,752 km. in 1938, was not stated in 1939, no doubt in line with the general policy of intensified military secrecy. There were 6,197 telephone exchanges in Japan on Sept. 30, 1939, and 1,006,498 subscribers to telephone service.

Agriculture.—There were 5,519,480 farm households in Japan in 1938, a figure which continued to show a slight but steady tendency to decline. It is probable that the need for munitions workers caused a shift of population to the towns; there was some planned settlement of young Japanese farmers in Manchoukuo. About 15% of the total area of Japan is arable land, and rice is the most important single crop and the staple food of the Japanese people. Silk is another important agricultural product; exports in 1939 were valued at 506,844,000 yen. There is a high proportion of fishermen among the Japanese peasants who live along the seacoast; and the basic diet of the masses of the Japanese people consists of fish and rice, supplemented by sweet potatoes, radishes and other home-grown vegetables and by various soybean preparations. Because of the intense crowding (almost 73,000,000 Japanese live in an area smaller than that of the state of California) there has been little development of livestock and dairy farming, and only a comparatively small number of Japanese of the more well-to-do classes regularly eat meat and milk products. There were 1,431,920 horses in Japan in 1936, but this number may have diminished because of requisitions for the needs of the army. Other kinds of livestock in Japan in 1938 were as follows: cattle, 1,894,261; swine, 1,140,479; sheep, 114,000; goats, 281,741. The total value of agricultural production in Japan in 1938 was 4,876,674,000 yen, more than double the figure at the depth of the economic depression in 1931; but rising prices accounted for much of this increase in value. After the beginning of the war with China in July 1937 the wholesale price index in Japan increased by 47%, the retail price index by 63%.

Manufacturing.—There were 112,332 factories employing more than five persons each in Japan in 1938, with 3,604,283 workers and employees and an output of production valued at 19,667,219,686 yen. Hand or cottage industries, employing five or less persons, play an important part in Japan's

economy and probably give employment to 3,000,000 people. Very interesting and significant, in connection with Japan's plunge into all-out war with the west, was the growth, absolute and relative, of three branches of industry most closely connected with the manufacture of munitions, the metal, the machine tools and the chemical. The metal industry, for instance, produced goods valued at 431,438,000 yen in 1931; this figure leaped more than tenfold, to 4,687,166,000 yen, in 1938. The machine tools industry went up from 498,014,000 yen to 3,821,881,000 yen during the same period. Chemicals rose from 816,559,000 yen to 3,460,581,000 yen. These three branches of industry, all adaptable to war uses, accounted for 61.3% of the total Japanese industrial output in 1938, as against 33.7% in 1931. The proportion had increased still further by 1941. Between 1938 and 1940 producers' goods increased by more than 10%, while there was a drop of almost 20% in the output of consumers' goods.

Mineral Production.—Japan is not a rich country in natural resources. Its principal minerals are coal (41,803,000 tons, produced, with a value of 305,537,000 yen); gold (22,235 kg.; value, 74,828,000 yen); copper (77,973,000 kg.; value, 66,617,000 yen). These figures are all for 1936, because a ban was imposed on the publication of figures of output after that year. There have been experiments with extracting oil from shale in Manchoukuo and with manufacturing oil from coal in South Sakhalin. (*See* also ARMIES OF THE WORLD; COMMUNISM; CHINESE-JAPANESE WAR; EXCHANGE CONTROL AND EXCHANGE RATES; FASCISM; UNITED STATES.)

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(W. H. CH.)

Japanese-Chinese War: *see* CHINESE-JAPANESE WAR.

Jarvis Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Java. First in population and resources, although fourth in size among the islands of the Dutch East Indies archipelago, Java is the most densely populated land in the world. With the adjacent small island of Madura it contains an area of 51,000 sq.mi. If the official estimate of 48,416,000 as the population in 1940 was correct, there were 949 inhabitants to the square mile. The volcanic soil of Java makes the island extremely fertile, and there was formerly a tendency to concentrate on the economic development of Java and pay relatively little attention to the so-called Outer islands. Harold Butler, former director of the international labour office at Geneva, described the countryside of Java as "an unending village surrounded by its laboriously tilled little fields and groves save where the plantations intervene." The inhabitants of Java are mostly Malays of the Mohammedan faith. Population pressure had made itself felt in Java, especially after the world depression of 1929–33, when the sales and value of the island's sugar crop and of some of its other export products declined disastrously. The Dutch authorities approached the problem from two angles: They tried to promote migration from Java with agricultural settlement in the Palembang district of Sumatra, in Celebes and in south-east Borneo. Later there was a drive for industrialization, stimulated both by the cutting off of communications with Europe and by the needs of defense. Some large foreign firms, including General Motors and Unilever, maintain plants in Java. What were formerly repair shops developed in some cases into metal and machinery works and it became possible to assemble in Java the parts of planes which were imported from abroad. Road rollers, tea-driers and some machinery for the rubber industry are produced locally. Ship repairing has been undertaken in Surabaya and Batavia, and factories for the manufacture of aluminum, scrap iron, paper, cement, glass and rubber were in operation or under construction in 1941. In normal times Java attracts a number of tourists because of the striking mountain scenery and the picturesque, colourful life of the natives. (*See* also DUTCH EAST INDIES; NETHERLANDS COLONIAL EMPIRE.) (W. H. CH.)

JEWISH RELIGIOUS SERVICES were held in the open air during 1941 in the bombed ruins of the Aldgate synagogue in London

Jewish Religious Life. With Jews virtually debarred from normal social, cultural and economic life, with mass arrests, deportations, expropriations, evictions, suicides and massacres of Jews, with ever more synagogues closed or bombed, Jewish religious schools and seminaries destroyed and rabbis killed, Judaism on the continent of Europe was crushed to new depths of misery. The cruelest suffering was in Poland, where a great religious community was caught in a death trap of hopelessness, starvation and massacre. Nevertheless, there was renewed religious and cultural activity amidst the disease, hunger and death of the nazi-sealed ghettoes.

The important centres of Jewish religious life were no longer in Europe but in the United States and in Palestine. Some rabbinical students, refugees from destroyed communities in Lithuania, reached Canada and Palestine from Japan. But the spread of World War II made the rescuing of refugees so heart-breakingly difficult that many sought escape through suicide, and some through baptism.

To some extent relieving this picture of gloom, refugees brought a certain reinvigoration of synagogues and Jewish religious life to Latin America. Figures released during the year show that while in the decade 1926 to 1936 the Jewish population in the United States increased by 13.7%, the number of synagogues increased by 19.6%. The very horror of the war scene evoked noble utterances from those who put their faith in religion. Thus the pope declared that "For the church there are neither heathens nor Jews, but only the children of God." When the synagogue in Marseilles was destroyed by collaborators of the gestapo, the Catholic bishop of the city took occasion to visit the local rabbi as a public demonstration of his sympathy, just as when the cathedral of St. Sophia in Salonika was bombed, the rabbinical council of that city donated 50,000 drachmas toward its repair.

Finally, the statement made on Oct. 5 by Vice-Commissar Lozovsky that religious freedom existed in Russia took on somewhat more plausibility for Jews who remembered that a few days earlier, for the first time since the communist campaign of militant atheism, the Russian government allowed a Hebrew broadcast to the Jews in the soviet union from the chief rabbi and other leaders of Palestine Jewry. This broadcast opened with the Jew's declaration of undying faith, "Hear, O Israel, the Lord is our God, the Lord is One." (*See* also ANTI-SEMITISM.)

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(D. DE. S. P.)

Jewish Welfare Board. The Jewish Welfare board is a member organization of the United Service Organizations for National Defense (USO). It was formed on April 9, 1917, to provide religious and morale needs of the men in the military forces of the United States. It continued this work ever since, with a greatly expanded program during World War II. The board has also continued to serve veterans of World War I and their families and members of the CCC. In all its welfare activities for men in uniform, the board has the co-operation of 34 national Jewish organizations comprising the leading religious, cultural and fraternal groups. In accordance with the regulations of the war and navy departments, the Jewish Welfare board has the authority to give ecclesiastical endorsement of rabbis who apply for service as chaplains with the armed forces.

The board is also the parent body of 325 Jewish community centres in the United States and Canada. These organizations were in 1941 located in more than 200 cities and had a membership of more than 400,000 men, women, young people and children. They conducted many social, cultural and recreational activities in buildings especially constructed for the purpose.

The board served these organizations through a field staff and specialists in program planning. It likewise aided in the activities of the regional organizations of the local centres. These bodies, closely integrated with the national organization, operated in metropolitan New York, New England, New York state, New Jersey, middle Atlantic states, midwest and the Pacific coast. A regional organization covering the southern states was in process of organization in 1941. The board is responsible for recruiting, training and placement of professional workers and co-operates with their professional society, the National Association of Jewish Center Workers.

The 1941 annual meeting of the board was held in Chicago, May 24, 25 and 26. The 1942 annual meeting was planned to be held April 11, 12 and 13, commemorating the 25th anniversary of the organization. The president of the board in 1941 was Frank L. Weil. John M. Schiff was chairman of its army and navy committee, and Louis Kraft was the executive director. The offices of the board are located at 220 Fifth avenue, New York city.

(F. L. W.)

Jews, Distribution of. In view of the fact that in several of the countries where the largest numbers of Jews were living in 1941 the census did not contain any questions regarding religion, and that in other countries, especially in Asia, no exact census existed, the exact number of Jews in the world in 1941 could not be ascertained. The definition of persons falling under the classification of "Jewish race" is in no way agreed upon. Several fascist countries in Europe which have introduced discriminatory legislation against the "Jewish race" have defined that term in different ways. In countries where the census includes questions of religious allegiance, even this religious criterion of Jewish faith is difficult to define exactly. Thus the estimates which generally vary around the figure of 16,000,000 for the Jews cannot claim any foundation on exact figures.

To this uncertainty about the number of Jews in the world was added in recent years a growing uncertainty about their numerical distribution in the different countries and continents. Events since 1933 have led partly to a decrease in the number of Jews as a result of a conscious policy aimed at their extermination, partly to a great shift in their distribution all over the world as the result of large enforced migratory movements. The national socialist legislation in Germany was introduced to a varying degree by conquest into Austria, Czechoslovakia, Poland, Norway, the Netherlands, Belgium, France, Yugoslavia, Greece, and was imitated in fascist countries like Italy, Hungary, Rumania and Bulgaria.

World War II directly involved the two eastern European countries with the largest Jewish population, Poland and the soviet union, where probably more than 6,000,000 Jews lived. The heavy hand of the conqueror was especially felt by the Jewish population of the conquered countries. Probably more than 1,000,000 perished as a result of war, mass persecution and starvation; the others were deprived of all means of economic livelihood and of cultural self-expression and faced a slow process of extermination. The new national socialist administration in Germany forced large migration of the Jews, uprooted whole populations from their historical seats of residence and changed whole districts, with a formerly relatively dense Jewish population, to districts entirely without any Jewish inhabitants. The movement of Jewish emigration overseas was considerably slowed down in 1941, both by the difficulties of obtaining exit permits and immigration visas and by the disruption of communications and the practically complete stoppage of transatlantic passenger traffic.

The number of Jews in the United States may be estimated at about 4,770,000, of whom about 4,300,000 were living in the northern states including the District of Columbia, Maryland and Delaware, 230,000 in the south, 220,000 in the west. The Jewish population of New York was estimated at 2,035,000. The number of Jews in Great Britain is 300,000, in Argentina 270,000, in Canada 150,000, in Cuba, 8,000, in Mexico 20,000 and in Brazil 50,000. All these figures are estimates. In Asia there were in 1941 about 900,000 Jews, of whom 500,000 were in Palestine; in Africa 600,000 Jews of whom more than 400,000 were in northern Africa. (*See* also ANTI-SEMITISM; REFUGEES.) (H. Ko.)

Johns Hopkins University, Baltimore, Md.; president, Isaiah Bowman, Ph.D., LL.D. Enrolment for 1941 in the several schools of the university was as follows: school of higher studies of the faculty of philosophy, 240; engineering, 364 (including 25 graduate students); arts and sciences, 328; business economics, 72; medicine, 302 (10 arts as applied to medicine); hygiene and public health, 126. Enrolment in the afternoon and evening courses was 2,685 and in the summer school, 743. At the end of the fiscal year the endowment of the university was valued at $30,907,474.27 and income from all sources for the year was $2,965,987.93. In the school of medicine Dr. Alfred Blalock was appointed professor of surgery to succeed the late Dr. Dean Lewis; Dr. John C. Whitehorn became professor of psychiatry, succeeding Dr. Adolf Meyer. In the faculty of philosophy Dr. Charles R. Anderson became associate professor of American literature. Dr. Anderson was to spend his first year in residence preparing a complete edition of the works of Sidney Lanier, the southern poet whose career was closely associated with Johns Hopkins. Mergenthaler Hall, a modern biological laboratory, was completed for the opening of the academic year. It provides facilities for expansion of the program of teaching and research in the biological sciences. (I. Bo.)

Johnson, Amy (1903?–1941), British aviatrix and heroine of many spectacular flights. She won acclaim in 1930 for her solo flight from England to Australia. In the summer of 1931 she made a record round-trip flight from London to Tokyo and in 1932 she flew from Lympne, England, to Cape Town in 4 days 6 hr. and 56 min. With her husband, Capt. James A. Mollison, she crossed the Atlantic in July 1933, flying from England to Bridgeport, Conn., where their plane was forced down, in 39 hr. After Britain went to war in 1939, she joined the auxiliary transport service. She lost her life in the line of duty when her plane crashed Jan. 5 over the Thames estuary.

Jones, Howard Harding (1885–1941), U.S. football coach, was born Aug. 23 in Excello, Ohio. He graduated in 1905 from Phillips Exeter academy, and in 1908 from Yale university, where he starred in baseball and football. His first coaching assignment was at Syracuse university in 1908, followed by assignments at Yale, 1909; Ohio State university, 1910–13; Yale 1913–16; University of Iowa, 1916–23; Duke university, 1924. From 1925 until his death, he was coach at the University of Southern California. Together with Knute Rockne and Glenn ("Pop") Warner, Jones was known as one of the game's great strategists. He compiled a lifetime record of 120 victories and 13 ties against 36 defeats. He died at North Hollywood, Calif., July 27.

Jones, Jesse Holman (1874–), U.S. secretary of commerce, was born in Robertson county, Tenn., on April 5. At Dallas, Tex., in 1895 he became manager of a lumber company and seven years later organized his own firm. In 1909 he established the Texas Trust company of Houston, later the Bankers Mortgage company. He also engaged in extensive real estate operations and bought control of the Houston *Chronicle*, of which he is publisher. President Hoover appointed him a director of the Reconstruction Finance corporation in 1932 and he became chairman the following year. In July 1939, pursuant to the regrouping of governmental agencies under the president's reorganization plan, Jones was appointed administrator of the Federal Loan agency. On Sept. 13, 1940 President Roosevelt nominated him secretary of commerce to succeed Harry L. Hopkins (*q.v.*), after congress had enacted a special law permitting Jones to retain the office of federal loan administrator. The senate confirmed this nomination the next day and he was sworn in Sept. 19, 1940. In the defense program of 1940 and 1941, Jones held an all-important position, since it was through the Federal Loan agency and RFC that most of the additions to plants and industries working on defense orders were financed.

Joyce, James (1882–1941), Irish author, was born Feb. 2 in Dublin. He showed a decided literary bent at the age of nine when he wrote a political tract denouncing anti-Parnellites. At 20, Joyce left Dublin for Paris, where he intended to study medicine, but he wrote short stories instead. Many of them were collected in a book called *Dubliners*, published in 1914. The Irish were so incensed with Joyce's unflattering descriptions of them that they burned the book in a Dublin public square. When war broke out in 1914, Joyce and his wife, then in Austria, moved to Zurich, Switzerland. His novel, *Ulysses*, published in Paris in 1922, was promptly banned in Great Britain and Ireland. Its sale was also prohibited in the United States until 1933, when Judge John Munro Woolsey ruled the book was not obscene and ordered the ban lifted. His last work, *Finnegans Wake*, parts of which appeared as *Work in Progress*, was published in May 1939. It was distinguished by the use of bizarre words coined by Joyce, who knew 17 languages, ancient and modern. He died Jan. 13 in a Zurich hospital. See *Encyclopædia Britannica*.

Judaism: *see* JEWISH RELIGIOUS LIFE.
Jugoslavia: *see* YUGOSLAVIA.
Julius Rosenwald Fund: *see* ROSENWALD FUND, THE JULIUS.
Jumping: *see* TRACK AND FIELD SPORTS.

Just, Ernest Everett (1883–1941), U.S. zoologist, was born Aug. 14 in Charleston, S.C., of Negro parentage. He studied at schools in the south and then moved to the north, where he was graduated from Dartmouth in 1907 with high honours in zoology and history. He was associated with Howard university, Washington, D.C. after 1907 and was zoology professor there from 1912 until his death. In 1915, he was awarded the Spingarn medal for his work in improving the standards of Negro medical schools. Dr. Just's research in cell biology won international recognition and he wrote extensively on the subject. He was a fellow of the American Association for the Advancement of Science, vice-president of the American Society of Zoologists, 1930; vice-president of the American Ecologists, 1930; and associate editor of a number of scientific reviews. He died Oct. 27 in Washington, D.C.

Justice, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Jute. India, which produces almost the entire world's supply of jute, cut the area planted in 1941 to 2,212,600 ac., only a little more than half the record planting of 4,112,750 ac. in 1940, when a record crop of 12,600,000 bales (400 lb. to the bale) was produced. In Bengal, which produces 80% to 90% of India's jute, planting in 1941 was restricted by law to one acre in three, as compared with 1940. The 1940 record crop left a large carry-over of jute after the heavy British demand for jute bags for war purposes had been largely satisfied. Scarcity of cargo space also limited shipments, and prices of burlap in the United States in the autumn of 1941 were about 50% to 70% higher than in the same period of 1940. At the request of the Office of Price Administration, the United States department of state began negotiations with the Indian government to control the rise in prices. In Brazil, which uses annually about 15,000,000 bags made of jute (1½ yd. of jute to the bag) for coffee shipments, a subsidized effort was begun to develop native fibres as substitutes. Five fibre plants were found to be suitable, and were under experimental cultivation in 1941. The five plants are paco-paco, juta indiana, malva veludo, gauzima and papoula de São Francisco. All jute materials manufactured in Brazil must contain at least 10% native fibres. In Colombia a fibre plant, fique, which is similar to sisal, was extensively used as a substitute for jute and sisal in 1941. Efforts were being made to produce fique in exportable quantities. (S. O. R.)

Juvenile Delinquency. In 1940 in the U.S. there was a decrease in juvenile delinquent cases disposed of by the 375 courts reporting to the children's bureau. In 1939 the number was 80,840. In 1940 it was 77,008. Juvenile court statistics are uniformly reported on a state-wide basis from 8 states and from 35 courts in 19 other states, and from the District of Columbia. The advantage of uniform reporting was gradually being recognized in an area that included 38% of the population of the United States.

White children were involved in 78%, Negro children in 22%, and children of other races in less than 1% of the cases of juvenile delinquency disposed of by juvenile courts in 1940.

Sex discrimination continued to be evident: About 23% more girls than boys were committed to correctional institutions, though the total number of girl offenders arrested was approximately one-fifth that of the boys.

The National Conference of Juvenile agencies and the American Prison association had an agreement that, beginning in 1942, their annual meetings should be known as the Congress of Correction. A group of leaders in the correctional field believed that this was an important administrative advance. The co-ordinating council movement expanded. Before 1930 there was one council, in Berkeley, Calif. In 1941 there were more than 600 in more

than 20 states. The co-ordinating council might be defined as a co-operative organization of public officials and private citizens designed to improve the community for the welfare of children.

The Osborne association completed a study of institutions for young offenders. This up-to-date information was expected to be helpful to all students of the field.

Burgess stressed the need for a better co-operation between the community and juvenile parolees. ("Crime Prevention and National Defense," *Proceedings of the National Conference of Juvenile Agencies*, 1941, pp. 37, 83–94.) (*See* also CRIME.)

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Kaiser Wilhelm II: *see* WILLIAM II.

Kameroons: *see* BRITISH WEST AFRICA; FRENCH COLONIAL EMPIRE.

Kansas. A central state of the United States, admitted Jan. 29, 1861; popularly known as the "Sunflower state." Total area, 82,276 sq.mi., of which 82,113 sq.mi. are land; pop. 1940, 1,801,028, a decrease of 79,971 or 4·3% from 1930. In rank the census placed the state 29th in comparison with 24th in 1930. Capital, Topeka (67,833). The two larger cities were Kansas City (121,458) and Wichita (114,966). Of the state's population in 1940, 753,941 were urban or 41·9%; 96·3% were white, 3·7% Negro, 3·0% foreign born.

History.—In the biennial election of 1940 all executive officers, Republicans, were re-elected, together with a Republican legislature: Payne H. Ratner, governor; Carl E. Friend, lieutenant governor; Frank J. Ryan, secretary of state; George Robb, auditor; Walter E. Wilson, treasurer; Jay S. Parker, attorney general; George L. McClenny, superintendent of public instruction; Charles F. Hobbs, commissioner of insurance; William C. Austin, state printer.

The legislature of 1941 enacted the largest body of laws of any single session since 1905: 401 bills and joint resolutions. The new school code and part of the tax code failed of passage. Among the more important laws enacted were the teachers retirement plan, the merit system, re-enactment of the interstate oil compact, ratification of the Republican river tri-state compact, authorization of a state committee on interstate co-operation, permission to counties to receive lump-sum payment from the United States in lieu of taxes on government projects, safeguarding of absentee voting, flood control, drainage and irrigation laws, outlawing of communistic and similar parties, prohibiting labour unions from discriminating against Negroes, creation of a state home guard, authorization of a state council of defense and redistricting of the state into six instead of seven congressional districts.

The defense effort in 1941 boomed the aircraft industry in Wichita. Defense plants were under construction at Kansas City, Parsons and Pittsburg.

Education.—The state had, in 1941, more than 200 public libraries, of which more than half were tax-supported. The enrolment in public and parochial elementary and secondary schools declined from 460,036 in 1930 to 423,166 in 1938; the number of teachers from 19,141 to 17,282. The high school enrolment, public and private, in 1938 was 111,704. The collegiate enrolment (all schools) was 24,550 in 1938; 24,814 in 1940–41; 21,706 in Sept. 1941, or a decline of 12.5% from the previous year. The 14 junior colleges lost most heavily, 21.7%; the 7 private two-year colleges 19.9%; the 21 four-year schools 9.87%.

Communication.—The state had 9,349 mi. of primary and 9,862 of rural highways; 8,667 mi. of railroads and 342,277 telephones in 1939.

Banking and Finance.—As of Dec. 30, 1939, there were 680 active banks, 182 of which were national, with total deposits of $400,000,000. Savings banks held $78,400,000 of deposits. The legislature in 1941 voted a budget of $19,106,794 for the biennium 1941–43, divided about equally between the two years.

Agriculture.—The year 1941 was favourable to crops, with above normal rainfall and temperature, marred in some localities by floods and losses on account of wet harvests. Yields per acre for most crops were above those of 1940. The hay crop was greater than that of 1940 and above the 10-year average for 1930–39; some alfalfa was cut five times. Feed grain supplies were the largest in 1941 since 1932–33; hay and roughage the highest in 12 years except 1940. The wheat crop was 173,332,000 bu., compared with 126,553,000 bu. in 1940 and a ten-year average of 131,581,000 bu.; it was the third largest crop in the history of the state. Corn production was 57,224,000 bu., compared with 42,353,000 bu. in 1940 and the ten-year average of 59,550,000 bu.; the acre yield was 23 bu., highest since 1928. The oat crop was below that of 1940, but barley was a record production. The grain sorghum yield was the highest per acre since 1928, and the sweet sorghum forage the highest on record.

Manufacturing.—The total value of manufactures in 1939 was $464,353,506; in 1937, $543,807,190; wages paid were $36,928,000 in 1939 and $40,513,398 in 1937. The five principal industries were meat packing, petroleum refining, flour, chemicals and creamery butter, rated according to value of their products.

Mineral Production.—The total value of mineral production in Kansas in 1939 was $123,391,521, as compared with $129,675,438 in 1938. In 1941, the petroleum industry in the west central part of the state was operating at top production to meet defense needs.

Principal Mineral Products of Kansas, 1939 and 1938

Mineral	Value, 1939	Value, 1938
Petroleum	$63,100,000	$72,100,000
Natural gas	29,356,000	27,485,000
Zinc	7,172,084	7,010,304
Cement	5,614,112	4,949,018
Coal	5,400,000	5,263,000
Stone	4,550,560	4,958,723

(J. C. MN.)

Kaspar, Karel (1870–1941), Czech cardinal, archbishop of Prague and primate of Bohemia, was born May 16 at Mirosov, Bohemia. He studied for the priesthood at the University of Pope Urban in Rome and later studied law at the University of St. Apolinare in Rome. He was named bishop of Kralove Hradec, Czechoslovakia, in 1921 and ten years later was appointed archbishop of Prague and head of the Catholic chaplains in the Czechoslovak army. An authority on canon law and a noted writer and theologian, he was named cardinal by Pope Pius XI in 1935. In Oct. 1938, Cardinal Kaspar denounced the Munich pact as an "injustice" imposed on the people of Czechoslovakia. He died in Prague, April 21.

Keitel, Wilhelm (1882–), German army officer, born Sept. 22, was a commander of artillery during World War I. On April 1, 1934, he was promoted to major general and the following year, when Germany introduced conscription, he took charge of the personnel section (*Wehrmachtsamt*) in the war ministry, and was thus connected to a certain extent with the reoccupation of the Rhineland in 1936, and with the dispatch of German reinforcements to Nationalist Spain. In Feb. 1938, during Hitler's "army purge" of Gen. von Blomberg and other conservative members of the high command, Gen. Keitel was appointed chief of the supreme command of the German armed forces. He thus directed operations against Poland, Norway, the Netherlands, Belgium, France and Britain in 1939 and 1940. On June 22, 1940 he signed the German-French armistice and on July 19 he was created field marshal by Adolf Hitler. In the various campaigns of 1941, Keitel's name was not prominently mentioned, although he continued to direct operations of the German forces. Prominence instead fell upon his subordinates in the army, such as Brauchitsch, Leeb, Rundstedt, Bock, Rommel (*qq.v.*). Reports that he had been demoted or dismissed during the Russian campaign were denied by the German radio and had not been substantiated at the end of the year.

Kelly, Colin P., Jr. (1915–1941), U.S. army flier, was born July 11 in Madison, Fla. He was graduated from West Point in 1937, commissioned as a second lieutenant of infantry, and on his own request was assigned to the army air corps. After completing training courses at Randolph and Kelly fields, he was assigned to the 19th bombing squadron at March field, Calif. In Sept. 1940, he was promoted to the rank of captain and he was stationed in the Philippines when

the U.S.-Japanese war broke out Dec. 7, 1941. On Dec. 10, Capt. Kelly sighted the 29,330-ton Japanese battleship "Haruna" off Aparri on the Luzon coast. He scored three direct hits on the ship, which later sank. While returning to his home air base, his plane was set on fire by two enemy craft and he ordered his crew to bail out. Six of his men were saved, but Capt. Kelly was killed in the resulting crash. The first U.S. air hero of World War II, he was posthumously awarded the Distinguished Service cross by the U.S. Far Eastern command.

Kenny Treatment: *see* INFANTILE PARALYSIS.

Kentucky. An east south central state of the United States, admitted June 1, 1792, popularly known as the "Blue Grass state." Area, 40,395 sq.mi. (286 sq.mi. water), pop. (1940) 2,845,627, of which 1,996,300 or 70·2% was rural and 849,327 or 29·8% urban. Negroes constituted 214,031 or 7·5%; and 15,631 were of foreign birth. Capital, Frankfort (11,492); largest city, Louisville (319,077). Other cities include Covington (62,018); Lexington (49,304); Owensboro (30,245); Paducah (33,765); Ashland (29,537).

History.—In the state election of Nov. 4, 1941, the voters returned a general assembly overwhelmingly Democratic: 75 Democrats in the lower house of 100 members, 29 Democrats in the senate of 38 members. Two constitutional amendments were adopted, the first providing "that the General Assembly may by general law distribute not to exceed 10% of the school fund on other than a census-pupil basis." The vote on this was 312,986 for, and 53,924 against. The second authorized any county to use voting machines at its own expense (176,596 votes for, 70,017 against). The chief officers of the state in 1941 were Keen Johnson, governor; Rodes K. Myers, lieutenant governor; Hugh Meredith, attorney-general; E. E. Shannon, treasurer; John W. Brooker, superintendent of public instruction; W. H. May, commissioner of agriculture.

Education.—There were, in 1940, 460,953 pupils in 6,621 elementary schools, with 13,694 teachers. In 683 high schools there were 5,958 teachers and 131,546 pupils. On April 1, 1941, Herman L. Donovan became president of the University of Kentucky, which had a total enrolment in 1940 of 6,242, of whom 2,850 registered in the summer session. The teaching staff of the State Teachers college at Bowling Green numbered 108; at Richmond, 87; at Murray, 84; at Morehead, 68.

Public Welfare, Charities, Correction.—Public assistance increased steadily. Old-age pensions in 1940 required $5,190,047; in 1941, $6,195,166; the number of beneficiaries rose from 591,315 to 688,509. A law of 1940 extending aid to the needy blind was declared unconstitutional. The correctional institutions in 1941 were the La Grange reformatory, Eddyville penitentiary, Greendale Houses of Reform for juvenile offenders and a women's prison in Shelby county.

Communication.—The highways of Kentucky in 1941 constituted 8,593 mi. under state supervision. Expenditures in the fiscal year 1940–41, raised largely by taxes on gasoline and motor vehicles, amounted to $19,686,952. There was one large airport in the state (Bowman field, Louisville) while another at Lexington was to be opened in 1942. Railway mileage was 3,723 mi.

Banking and Finance.—There were 314 state banks with deposits of $225,056,000 in 1941, while the deposits of 95 national banks were $257,892,000. In the fiscal year 1940–41, the general state expenditures were $24,680,350, exclusive of bridge and road improvement funds. Receipts were $30,836,809. The state debt of $4,097,000 (Dec. 1940) was entirely eliminated and Kentucky had its first surplus since 1904—$1,980,075.

Gross income from farm crops in 1940 was $199,684,000, to which the U.S. government added $13,318,000 in payments to farmers. Cash income from livestock was $72,434,000. The reduction in volume of agricultural products in 1941 was due to diminished rainfall during a period of 17 months in 1940–41.

Manufacturing.—In 1937 there were 1,624 establishments with 68,998 wage earners and an output valued at $504,897,000.

Mineral Production.—The total value of mineral production in Kentucky was $113,243,154 in 1939, as compared with $106,654,903 in 1938.

Table I.—*Leading Agricultural Products of Kentucky, 1941 and 1940*

Crop	1941	1940
Corn, bushels	73,400,000	70,400,000
Wheat, bushels	5,625,000	4,071,000
Oats, bushels	1,722,000	1,400,000
Barley, bushels	2,825,000	1,825,000
Hay, tons	1,591,000	5,629,000
Irish Potatoes, bushels	3,901,000	4,140,000
Tobacco (all types), pounds	285,240,000	338,477,000

Table II.—*Principal Mineral Products of Kentucky, 1940 and 1939*

Product	1940	1939
Coal	49,383,303 tons	42,310,995 tons
Gas	45,000,000,000 cu. ft. (est.)	
Petroleum	5,191,025 bbls.	5,518,089 bbls.

(E. T.)

Kenya: *see* BRITISH EAST AFRICA.

Kerrl, Hanns (1887–1941), German politician, was born Dec. 11 in Fallersleben, Germany. He was made minister of justice when Hitler came to power in 1933 and became minister without portfolio in 1934. In 1935, he was appointed minister for church affairs. Kerrl was a leader of the nazi effort to establish full state control over the church, and his order in 1935 suppressing the Protestant professional synods resulted in considerable opposition from German churchmen. Although Kerrl was a virtual dictator of the German churches, many clergymen refused to recognize his authority, notably Pastor Martin Niemoeller, whose opposition to nazi measures led to his imprisonment. Kerrl died in Berlin, according to a Berne dispatch of Dec. 14.

Kidd, Isaac Campbell (1884–1941), U.S. admiral, was born March 26 in Cleveland, Ohio, and was graduated from the naval academy in 1906. After serving on several U.S. warships, he returned for duty at the naval academy, 1916–18, and became flag lieutenant and aide on the staff of the commander-in-chief of the Atlantic fleet in 1919. He was made chief of staff and aide commander of battleships of the battle force in Feb. 1940 and was appointed rear admiral in July of the same year. Kidd served as aide on the staff of Admiral Husband E. Kimmel (*q.v.*) with the Pacific fleet and was in command of a battleship division during the surprise attack on Pearl Harbor, Hawaii, Dec. 7, 1941. He died when his battleship, the 32,600-ton "Arizona," was sunk by the Japanese. He had been awarded the Cuban Pacification medal, the Mexican Service medal, the Victory Fleet medal and the Atlantic Fleet clasp.

Kidnapping. As in previous years, kidnappings in China and in Palestine during 1941 were of a particularly striking character. In Shanghai several such cases culminated in the seizure of nine Central Bank of China employees on April 17, and were attributed to a new outbreak of the terrorism occurring during March. In September, Mrs. Denzil Clark, Japanese-born wife of a British embassy press attaché, was kidnapped and held by Japanese extremists until freed nine days later through the intervention of Japanese authorities.

On May 4, wholesale kidnapping of Jewish leaders by Arab nationalists was reported in Palestine. It signalized the Arab reaction to events in the Balkans and Mesopotamia and particularly to the mass arrival of Jewish immigrants from the Balkans.

Strangest case of the year in the United States was the attempted kidnapping of ex-Governor E. D. Rivers of Georgia on Oct. 2. Gov. Rivers and his wife were severely beaten by H. W. Bikle, Jr., a former school teacher. Investigation showed evidence of an intent to kidnap induced by psychopathic disturbances in the assailant who committed suicide shortly after his plan was frustrated.

The support extended in 1940 by U.S. Attorney-General Robert H. Jackson to the proposed statute authorizing police to have recourse to wiretapping in kidnapping investigations had further repercussions in 1941. Director J. Edgar Hoover of the federal bureau of investigation presented the case for the proposed statute on Feb. 18 and Pres. Roosevelt gave his endorsement on Feb. 26. U.S. Attorney-General Biddle likewise backed the bill on Oct. 9.

The record of kidnappings in the United States from the enactment of the Federal Kidnapping act in 1932, to Dec. 31, 1941, showed no marked trends. Unusually high levels were reached in 1936 and 1938, with 1932, 1933, 1940 and 1941 occupying the lower end of the scale. Available figures for a ten-year period appear in Table I.

Since the federal bureau of investigation was accorded concurrent jurisdiction with state and local police in kidnapping investigations, that agency

Table I.—*Kidnappings Investigated in U.S., 1932–41*

Year	*Total Number of Kidnappings*	*Number Wherein Ransom Demanded*
1932 (from June 22)	5	5
1933	14	10
1934	18	5
1935	26	1
1936	31	1
1937	20	4
1938	37	5
1939	20	0
1940	12	1
1941	9	0

has participated in 211 cases, all but two of which have been solved; 430 convictions have been secured, involving 12 death sentences and 43 of life imprisonment. Nine kidnappers committed suicide, eight were killed by law enforcement officers, seven were murdered by accomplices, and two were lynched. All of the cases investigated during 1941 were solved. Fifteen convictions were secured, totalling 162 years of penal servitude, and 26 fugitives who had been sought for some time were finally apprehended and convicted during this twelve-month period.

Great Britain.—Official reports of kidnapping in England are confined to stealing children under 14 years of age. The record since 1900, summarized to the latest date for which official reports are available, appears in Table II.

Table II.—*Record of Kidnappings in England since 1900*

Five Year Averages		*Annual Totals*	
1900–1904	15	1935	4
1905–1909	10	1936	3
1910–1914	7	1937	7
1915–1919	8	1938	5
1920–1924	4		
1925–1929	4		
1930–1934	5		

The total of 19 kidnappings therein shown for the years 1935–1938 inclusive is far above the record for any of the five-year periods between 1905 and 1934. Extreme emergencies due to war have prevented the publication and dissemination of the record of kidnappings in England and Wales for the years subsequent to 1938. (*See* also FEDERAL BUREAU OF INVESTIGATION.)

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Kimmel, Husband Edward (1882–), U.S. naval officer, was born at Henderson, Ky., on Feb. 26. He attended Central university in 1899, and was graduated from the U.S. Naval academy in 1904. Commissioned ensign in 1906, he rose through the ranks, serving as a special aide to Franklin D. Roosevelt, then assistant secretary of the navy, in 1915. He was promoted to the rank of rear admiral in 1937, and in 1939 he commanded three cruisers on a good-will tour of South America. On Feb. 1, 1941, he succeeded Adm. James O. Richardson as commander in chief of the Pacific fleet, with additional duties as commander in chief of the U.S. fleet, and was raised to the rank of admiral. On Dec. 17, 1941, Adm. Kimmel was relieved of his command, less than 48 hours after Secretary Knox stated that the U.S. land and sea forces "were not on the alert" during the Japanese attack on Pearl Harbor, Dec. 7.

King, Ernest Joseph (1878–), U.S. naval officer, was born Nov. 23 in Lorain, O. He left Annapolis to serve in the Spanish-American War, returning to the naval academy to graduate in 1901. During World War I he was assistant to the chief of staff of the commander in chief of the U.S. fleet. He qualified as a naval aviator in 1927 and was chief of the bureau of aeronautics, 1933–35. In 1933 he was promoted to rear admiral and he was vice-admiral in command of the fleet's aircraft battle force, 1938–39.

On Feb. 1, 1941, Adm. King was made commander of the Atlantic fleet and on Dec. 20, 1941, 13 days after the Japanese attack on U.S. possessions in the Pacific, he was designated commander in chief of the U.S. fleet, in what was apparently a shake-up in navy organization as well as personnel. In his new post, King outranked the chief of naval operations, was made responsible only to the president and the secretary of the navy, and assumed supreme command of all U.S. naval operating forces in Atlantic, Pacific and Asiatic waters.

King, William Lyon Mackenzie (1874–), Canadian politician, was born at Berlin (now Kitchener), Ont., Dec. 17. His grandfather, William Lyon Mackenzie, had been prominent in the struggle for political freedom in 1837. King entered parliament in 1908, became leader of the Federal Liberal party in 1919, and was returned to office as prime minister for the third time on Oct. 23, 1935. Shortly after Canada entered World War II, King's foes charged him with negligence and incompetence in handling the war effort. But the country did not support this view, and in March 1940 his party won a landslide election, adding 25 seats to its parliamentary majority. In Aug. 1940, when a nazi invasion of Britain appeared imminent, the Canadian prime minister conferred with President Roosevelt, and both agreed to set up a permanent joint board of defense to study common defense problems. The fruit of another parley with President Roosevelt on April 20, 1941, was a U.S.-Canada pact for co-operation in producing war materials for Britain. On Nov. 1, 1941, King and the U.S. chief executive met again to map plans for a concerted policy to speed war aid to the U.S.S.R. On Oct. 18, 1941, King announced his government's decision to control wages and prices, and on Dec. 29 his government decided to cancel the British war debt of $1,500,000,000 that had accumulated for the purchase of war munitions in Canada after 1939. (*See* also *Encyclopædia Britannica.*)

Kittredge, George Lyman (1860–1941), U.S. educator, was born Feb. 28 in Boston, Mass. After graduating from Harvard in 1882, he taught Latin for six years at Phillips Exeter academy. He returned to Harvard as an instructor in 1888, and from 1894 to 1936 he was professor of English. Prof. Kittredge was an authority on Beowulf, Chaucer, Middle English and Anglo-Saxon lore, Sir Thomas Malory and on New England witchcraft. He was awarded honorary degrees by many U.S. and British universities. Among his works are *The Language of Chaucer's Troilus* (1894); *The Mother Tongue* (co-author with Sarah Louise Arnold) (1900); *Words and Their Ways in English Speech* (co-author with Prof. James B. Greenough) (1901); *English Witchcraft and James I* (1912); *Chaucer and His Poetry* (1915); *Gawain and the Green Knight* (1916); *Sir Thomas Malory* (1925); and *Witchcraft in Old and New England* (1929). He died at Barnstable, Mass., July 23.

Kiwanis International. Kiwanis International is made up of 2,163 clubs, with a membership of 112,000 in communities throughout the United States and Canada.

The first Kiwanis club was organized in Detroit, Mich., Jan. 1915. In Canada, the first club was organized in Hamilton, Ont., Nov. 1916. Each club is made up of two representatives from every local business, professional and agricultural classification, united for the rendering of civic and social service to the community. The name "Kiwanis" is a coined word, which receives its real meaning from the constructive, unselfish work of Kiwanians. The motto of the organization is "We build."

The general office is at 520 N. Michigan avenue, Chicago, Ill. President in 1941 was Charles S. Donley, Pittsburgh, Pa.; secretary, O. E. Peterson, Chicago, Ill. (L. H. Ds.)

Knights of Columbus. Special emphasis, because of defense and war programs, was placed upon the traditional slogan of Columbianism, "For God

and Country." Organized in 1882, the order is dedicated to the preservation and the championship of Catholic and traditional American principles. Membership is limited to Catholic men, practically and sacramentally adhering to the precepts of the church.

The total membership, as of June 30, 1941, amounted to 414,952. The net loss during the fiscal year was 4,159. The associate members numbered 196,884; the insurance members 218,068. There were 2,478 local councils, in 48 states, the American territories and possessions, Canada and Latin America. The insurance department reported total assets of $50,137,702.20; total liabilities of $44,455,911.89. Death claims, old-age benefits and other obligations amounted to $4,284,752.86.

The 59th supreme convention was held, Aug. 19–23, at Atlantic City, N.J. Delegates from 60 state and regional jurisdictions attended. Officers re-elected for another term were: supreme knight, Francis P. Matthews; deputy supreme knight, John E. Swift; supreme secretary, Joseph F. Lamb; supreme treasurer, Daniel J. Callahan; supreme advocate, Luke E. Hart. Rev. Leo M. Finn was reappointed supreme chaplain.

Remembering the magnificent record of the Knights of Columbus in ministering to the spiritual and material needs of the armed forces during World War I, the order was eager to meet the war conditions. It merged its activities with the National Catholic Community service, set up by the American bishops; the supreme knight was designated chairman of the N.C.C.S.; all jurisdictions, national, state and local, gave full co-operation to the N.C.C.S. and the United Service organizations, and local councils cooperated with civilian defense, service clubs, defense bonds, community and other war activities.

In addition to promoting the fraternal ideals, the order engaged in Catholic action by sponsoring radio programs, promoting study clubs and forums, aiding in the elimination of indecency in motion pictures and publications, combatting anti-Catholic and anti-American forces, intensifying religious observances and celebrations. Notable was the work in developing the Boy Life bureau, through the expansion of the Columbian squires and the training of adult leaders.

National headquarters in 1941 were at New Haven, Conn. *Columbia*, a monthly illustrated magazine, and *News*, a weekly, are the official organs. (F. X. T.)

Knox, (William) Franklin (1874–), U.S. publisher, statesman and soldier, was born Jan. 1 at Boston and was educated at Alma (Mich.) college. He joined Theodore Roosevelt's Rough Riders, with whom he served from April to Sept. 1898. Commissioned a major in 1917, he was in France from May 1918 to Feb. 1919 and became colonel in the 365th field artillery. His newspaper career began shortly after his service in the Spanish-American war, when he was successively reporter, city editor and circulation manager of the Grand Rapids, Mich., *Herald*. From 1901 to 1912 he was publisher of the Sault Ste. Marie, Mich., *News*, and in 1913 he purchased control of the Manchester, N.H., *Union and Leader*. Later he became associated with the Hearst newspaper chain and was its general manager until 1931, when he became publisher of the *Chicago Daily News*. In 1936 Col. Knox was the Republican candidate for vice-president. On June 20, 1940, Knox was appointed secretary of the navy by Pres. Roosevelt.

On March 24, 1941 he declared that the war is "our fight"; on June 30 he urged immediate U.S. entry into the battle of the Atlantic; on Sept. 15 he announced the beginning of U.S. convoys to Iceland; on Oct. 1 he said the U.S. and Great Britain should police the world for at least a century after the axis' defeat in order to prevent a recurrence of German aggression. Aside from his regular duties in Washington, Knox made several inspection tours of U.S. naval bases during the year. In December he flew to Hawaii to determine the exact amount of damage to the U.S. fleet and to Pearl Harbor caused by the Japanese attack on Oahu. Upon his return to Washington Dec. 15 he listed the loss of one battleship, three destroyers, a target ship and a minelayer, and damage to various other vessels. In his report Knox also stated that the naval forces at Pearl Harbor were not on the alert Dec. 7 and that the Japanese attack had been greatly facilitated by "the most effective fifth-column work in this war."

Knudsen, William Signius (1879–), U.S. industrialist, was born in Copenhagen, Denmark, on March 25 and as a youth worked in a bicycle shop in his native town. At the age of 20 he emigrated to the United States, where he found work in a shipyard in New York. After working in a railroad shop, he went to Buffalo, where he ultimately became superintendent of a mill. He then worked for Ford Motor company and became associated with Chevrolet Motor company, of which he was made vice-president in 1922 and later president. From 1933 to 1937 he was executive vice-president of General Motors corporation, and in the latter year he became president. On May 28, 1940 President Roosevelt appointed him commissioner of industrial production for the national defense advisory commission. This position assumed increasing importance during the remainder of the year and although the commission had no chairman with authority until Dec. 20, Knudsen was recognized as its most outstanding member.

When President Roosevelt created the Office of Production Management (*q.v.*) Jan. 7, 1941, he named Knudsen director general. Knudsen continued to be the "top man" in the production phase of national defense until Jan. 1942, but gradually matters of general policy were delegated to other agencies such as the Office of Price Administration, the Supply Priorities and Allocations board (*qq.v.*) and the War Production board. Friction among the various agencies seemed to be inevitable, and on July 23 Knudsen admitted "a little dispute" with the OPA and Leon Henderson (*q.v.*) over the curtailment of motor car production. Knudsen had contended that an arbitrary reduction of 50% would throw thousands out of work and dislocate the U.S. economy.

Koffka, Kurt (1886–1941), U.S. psychologist, was born March 18 in Berlin. He studied at the University of Edinburgh and at the University of Berlin, where he received his Ph.D. in 1908. He taught psychology in German universities and in the U.S. was professor at Cornell, 1924–25, the University of Wisconsin, 1926–27 and Smith college, 1932–41. His treatise, *Die Grundlagen der psychischen Entwicklung* (1921), which appeared in English under the title *Growth of the Mind* (1924), established him as a leading exponent of the Gestalt theory. In 1935 he wrote *Principles of Gestalt Psychology*. Koffka died in Northampton, Mass., Nov. 22.

Konoye, Fumimaro (1891–), Japanese prince and statesman, was born at Kyoto in October, son of Prince Atsumaro Konoye and descendant of one of Japan's oldest families. He graduated from Tokyo Imperial university's law college in 1917 and was a member of Prince Saionji's delegation to the Paris peace conference the following year. After serving in the house of peers he was prime minister in 1937–39 and subsequently minister of state without portfolio and president of the privy council. In July 1940, after the resignation of Adm. Yonai, he again became prime minister. On Aug. 1, 1940 the government announced that it would pursue a totalitarian

policy which would include Japanese domination over Asia, but shortly thereafter Konoye announced that he did not propose to set up a single-party state because "the privilege of assisting the throne cannot be monopolized by a single individual or a single party."

Konoye's ministry in 1941 was generally one of moderation in foreign affairs. In a strange address before the house of representatives Jan. 27 he craved the forgiveness of the emperor and the people for the "billions of yen spent and 100,000 officers and men sacrificed" in the war with China. On April 8 he warned the Japanese against a "blind imitation of foreign ideas" (*i.e.*, fascism) and called for a resurgence of the "traditional Japanese spirit." This point of view did not set well with the army. Konoye resigned July 16 and formed a new cabinet two days later without his foreign minister, Yosuke Matsuoka (*q.v.*), who had been subjected to considerable criticism. The new cabinet lasted only three months, and Konoye was succeeded in October by Hideki Tojo (*q.v.*), who was pledged without reservations to fulfilment of Japanese aspirations in eastern Asia. (*See* JAPAN.)

Korea: *see* CHOSEN.

Korizis, Alexander (1885–1941), Greek statesman and financier, was born April 15 on the island of Poros in the Aegean sea. At 18 he clerked in the National Bank of Greece. He rose from the ranks, instituted many notable economic and social reforms in the realm of agricultural credit, and was appointed governor of the bank in 1939. A close friend of King George II and Premier Metaxas, he was appointed minister of health and social welfare in 1936. Upon the death of Metaxas in Jan. 1941, Korizis assumed the premiership of his country, then at war with Italy. Korizis, however, lacked a military background and broad political experience, and his selection as premier was criticized by many in Greece. A few days after the German invasion in April 1941, it became evident to Korizis that the pitifully small Anglo-Greek forces could not hope to repel the powerful armoured units of the invaders and, depressed over his country's plight, the new premier took his life in Athens, April 18.

Kourkoulis, Methodios (1862–1941), U.S. prelate in the Greek Orthodox church, was born Oct. 26 on the island of Mytilene near the Dardanelles. In 1904 he went to the United States and was appointed dean of the Holy Trinity Greek cathedral in New York city. In 1939 he was invested with the title of grand archimandrite of Istanbul. This office gave him the privilege of taking up residence as dean in any Greek Orthodox monastery. Archimandrite Kourkoulis was twice decorated by the Greek government for his services in raising funds in the United States for aid to the Greek army in the Balkan wars of 1912–13. He died in New York city, April 9.

Krause, Allen Kramer (1881–1941), U.S. tuberculosis expert, was born Feb. 13 at Lebanon, Pa. He was graduated from Brown university in 1901 and in 1907 received his M.D. from Johns Hopkins. From 1909 to 1916 Dr. Krause was assistant director at the Saranac (N.Y.) laboratory, and later returned to Johns Hopkins to direct the Kenneth Dows Tuberculosis Research laboratories and the hospital's tuberculosis dispensary. He was clinical professor of medicine at Stanford from 1929 to 1937 and held a similar post at the University of Southern California from 1932 to 1937. An authority on tuberculosis, Dr. Krause was named managing editor of *The American Review of Tuberculosis* in 1916 and was editor of the journal from 1922 to 1939. He also edited the American section of a British journal, *Tubercle*. Among his books are *Rest and Other Things* (1922); *Environment and Resistance in Tuberculosis* (1923); and *The Evolution of Tubercle* (1927). In 1931 he was awarded the Trudeau medal for tuberculosis research. He died in Providence, R.I., May 12.

Krivitsky, Walter G. (1899–1941), former chief of the Russian army intelligence service of western Europe, was born Samuel Ginsberg, June 28, in Podvolochiska, western Ukraine. After 14 years in the soviet military intelligence service, he was called to Moscow in 1933 to head the soviet War Industries institute and in 1935 was sent abroad as chief of military intelligence in western Europe. This post he held until Nov. 1937, when he fell into disfavour with the Kremlin and fled to Paris. He later went to the United States. One of the few soviet generals to survive the Red army purge of 1936 and an outspoken critic of the Stalin regime, he lived in constant fear of the OGPU. He wrote a series of articles for the *Saturday Evening Post* in 1939 exposing soviet foreign policy. His book *In Stalin's Secret Service*, an exposé of Russia's secret policies, was published in 1939. Krivitsky died under circumstances that indicated suicide in Washington, D.C., Feb. 10.

Kuibyshev. Formerly Samara, it is a town of the U.S.S.R. in 53° 11′ N., 50° 9′ E., on the east bank of the Volga loop at the junction of the Samara river, a busy river port and important centre of rail communication. Pop. (1939) 390,000. (See *Encyclopædia Britannica*.) Renamed Kuibyshev in 1935, the town and district have been transformed from a mercantile and agricultural region into an industrial area. Industrial production in 1937 was valued at 652,000,000 roubles, compared with 363,000,000 roubles of agricultural production. Industries include railway equipment, carburettors, cinema apparatus and tractor parts, food, leather and timber. Under the expansion and mechanization of agriculture Kuibyshev, which is in the fertile black-earth district, had in 1941 approximately 150 tractor stations working on an arable area of 8,400,000 ac. More than 30,000,000 roubles were spent on irrigation during the second five-year plan, and it was decided to create in the Kuibyshev district the largest hydroelectric project in the world. Further, Kuibyshev is an important oil centre in the vast oil area which has been termed the "second Baku." As the focus of cultural activity in the Volga region, Kuibyshev supports 7 high schools, 18 higher technical schools, 6 scientific research institutes, 6 theatres and a large palace of culture.

In Oct. 1941 as the German drive upon Moscow became threatening, part of the central administration was transferred to Kuibyshev, which for a brief period was considered the provisional Russian capital, particularly since official statements to the press were issued there, and foreign correspondents were quartered in the city. During the second week in December, however, the Russians' counteroffensive on the central front removed any immediate danger to Moscow, and the administrative bureaus and newspapermen moved back to the capital. (*See* UNION OF SOVIET SOCIALIST REPUBLICS.)

Kurusu, Saburo (1886–), Japanese statesman, was born in Yokohama and studied for a diplomatic career. He entered the foreign service in 1910 and served as consul in Chicago, New York city, the Philippines and Honolulu. Kurusu was minister to Peru, 1928, director of the commerce bureau at the foreign office, 1932–37, and ambassador to Belgium, 1937. Later, as ambassador to Germany, he signed the Rome-Berlin-Tokyo pact (Sept. 27, 1940). In Nov. 1941, he was sent to the United States to assist Japanese Ambassador Nomura in what

Domei (Japanese) news agency called a "last effort to readjust Japanese-American relations which have gone from bad to worse." He started peace negotiations with President Roosevelt and Secretary of State Hull on Nov. 17, 1941. On Dec. 7, 1941, he handed Secretary of State Hull a note rejecting the U.S. peace proposals.

A few hours earlier, the Japanese had launched their blitz attack on Hawaii.

Kuwait: *see* ARABIA.

Kyanite. The production of kyanite in the United States rose from 2,950 short tons in 1939 to 4,241 tons in 1940, valued at $94,000, mainly in California and Virginia, with some from North Carolina and Georgia. Imports increased even more, from 3,381 tons to 7,658 tons, all from India. (G. A. Ro.)

Labor Relations Board, National: *see* NATIONAL LABOR RELATIONS BOARD.

Labor, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Labour: *see* AMERICAN FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; DEFENSE MEDIATION BOARD, NATIONAL; DEFENSE, NATIONAL (U.S.): *Labour;* LABOUR UNIONS; LAW; MOTION PICTURES; NEGROES (AMERICAN); RADIO; RELIEF; STRIKES AND LOCK-OUTS; SUPREME COURT OF THE UNITED STATES: *Labour;* UNEMPLOYMENT; UNITED STATES: *Labour Problems;* WAGES AND HOURS. *See* also under various states.

Labour Party. The British Labour party's annual conference, held in June 1941, was attended by 642 delegates, of whom 354 represented trade unions, 264 divisional labour parties, and the rest Socialist and miscellaneous organizations. Less than half of the divisional parties sent delegates, for many active party workers had been absorbed into the civil defense services, besides those who were in the armed forces or busy on munitions. The same causes led to a substantial fall in local membership.

Individual membership of the constituency parties fell from 240,000 to 176,000 for men, and from 169,000 to 129,000 for women. Affiliated trade union membership, on the other hand, rose slightly—from 2,214,000 to 2,227,000—with the result that total membership showed only a small decline.

On the side of organization the most important event of the year was the decision of the Co-operative congress to join the National Council of Labour, which represents the Labour party, the Parliamentary Labour party and the Trades Union congress, and is the body responsible for general declarations of policy on behalf of the Labour movement as a whole. This meant a closer union between the co-operative and the industrial and political sections of the movement.

At the party conference, declarations dealing with the war situation and with postwar reconstruction were endorsed by large majorities. The conference reasserted its determination "to fight until naziism and fascism are overthrown," and to make "a peace which restores freedom and independence to the conquered peoples." It affirmed the need for international economic planning based on socialist principles and on recognition of "the fact that the world is now a single economic unit." It demanded a "combination of equity with efficiency" in the conduct of the war, the maintenance of civil liberty, and the extension of the social services to deal with wartime needs.

The nazi attack on the soviet union was subsequent to the party conference, and it therefore fell to the national executive and to the National Council of Labour to urge the need for closer unity between the British and soviet peoples, and for the fullest possible help to be given to the Russians.

The party appointed a special committee to study questions of postwar reconstruction, with Emanuel Shinwell, M.P., as chairman, and Prof. Harold J. Laski as secretary. It also decided to expand its research department, and to resume the publication of propagandist pamphlets on reconstruction. A number of subcommittees was appointed to deal with various aspects of postwar policy.

The electoral truce remained in force throughout 1941, and no party candidates were put forward except for seats already held by Labour. The party organized national speakers' campaigns in behalf of the war effort, and also a series of regional delegate conferences; but little general propaganda was carried on, and there was a tendency for enthusiasm to overflow into such movements as Federal Union, the 1941 Committee and Sir Richard Acland's *Unser Kampf* campaign.

A number of local parties supported the People's Convention movement, led by D. N. Pritt, K.C., which was outlawed by the national executive as acting under communist influence, and was in fact demanding peace until the nazis attacked the soviet union, when, in common with the Communist party, it rapidly changed its line.

In parliament the Labour party continued to support the government and to be represented in the war cabinet. *See* CABINET MEMBERS. (G. D. H. C.)

Labour Unions. The unusual expansion of private business and defense production during 1941 in the United States brought the unions into frequent conflict with employers, the government and one another. The favourable circumstances of rapidly increasing employment and the multiplication of government contracts for war products gave added impetus to the labour organizing campaigns which were initiated the year before. The variety of demands necessarily associated with such campaigns encountered opposition from the employers and precipitated a great increase in the number of strikes in both defense and ordinary industry. By the first of December the number of strikes amounted to more than 4,000, as against 2,400 in 1940 and 4,700 in the troubled year, 1937. Man-days lost through strikes rose to more than 22,000,000, a figure again exceeded only by 1937, when the wave of sit-down strikes and unionizing activities by the C.I.O. produced such abnormal disturbance in American industry. (*See* also STRIKES AND LOCK-OUTS.)

This condition of unrest and interruption of vital war production forced the government to make radical changes in its methods of handling labour disputes and, in some measure, in its labour policy. On March 19, the president set up by executive order a new board, the Defense Mediation board (*q.v.*), to prevent and settle strikes on defense work. This agency was a bipartisan board, composed of representatives of organized labour, employers and the government. Its first chairman, designated by the president, was Clarence A. Dykstra, president of the University of Wisconsin. The docket of the board was soon crowded with cases, certified to it by the secretary of labour. Although the board earned a fair measure of success, it was unable effectively to stem the tide of stoppages and month after month numerous defense plants were shut down, in some instances for prolonged periods. On Nov. 11, the work of the board virtually came to an end because of the resignation of the C.I.O. members and the decision by C.I.O. unions not to submit their cases to it. In December, therefore, the president convened a conference of employers and union officials instructed to devise the means of avoiding strikes and to suggest the essential features of a new arbitrating and mediating agency.

The causes of the failure of the mediation board were many but its steady loss of prestige and effectiveness and its ultimate disintegration were mainly due to the uncompromising position taken by the C.I.O. on the issue of the closed shop and the inability of the board in the first days of its operation to reach an agreement on a few guiding principles. It was clear from the outset that the most stubborn issues destined for adjudication by the board would be wages and the closed shop. Many students of labour relations believed that the board would simplify its task by seeking agreement on the basic principles of a sound public policy concerning these questions, much as the War Labor board of World War I had done. The board, however, undertook to decide each case on its merits and to refrain from laying down general principles of settlement. It was, consequently, led to arrive at contradictory conclusions, granting the closed shop in some disputes and denying it in others. This process of indecision reached

THE 700 NON-UNION EMPLOYEES of International Harvester company determined to enter their strike-closed plant at Richmond, Ind. March 27, 1941 and go back to work. A pitched battle with strikers at the gate ensued; 30 were injured

its climax in the captive mine case where the full membership of the board met to pass on the demand by the United Mine Workers for a closed shop in the coal mines owned by the steel companies and producing coal exclusively for the use of the steel industry. A majority decision against the miners was followed by the resignation of the C.I.O. members of the board and its swift demise.

Another source of weakness was the board's uncertain authority. It was not empowered to prohibit strikes, even for the duration of a waiting or cooling-off period, nor was it empowered to engage in compulsory arbitration. Yet on two occasions—in the cases of the Federal Shipbuilding company of Kearny, N.J. and Air Associates of Bendix, N.J.—when the employers refused to accept the board's findings, it recommended to the president that the government take over the plants and run them. Since the concession recommended by the board in the Kearny case was a provision for the maintenance of union membership (a requirement that employees who were members of the union at the time of the signing of the contract should retain their membership and pay dues or else be discharged) it was peculiarly unpalatable to the employers of the country and did much to undermine their confidence in the board.

In the course of the year, the closed shop became the most contentious of labour issues. The importance of this issue was closely related to the youth of leading C.I.O. unions and to the difficulties they were encountering in collecting dues from their greatly expanded membership. Recognizing the fact that many of the conditions of the current war boom were extraordinary and temporary, these unions sought to ensure themselves against future uncertainties by the use of some device that would automatically force employees into a union and keep them there once they had joined. The most effective of such devices is the closed shop, whereby employers undertake to hire and give employment exclusively to union members. Where the closed shop is in force, the union of course finds it easy to hold its members and collect dues. The drive for the closed shop aroused great opposition from the employers. They saw in it a far-reaching and serious encroachment on the powers of management and they sought to have the demand for the closed shop, except where voluntarily ceded by the employer, suspended for the duration of the war. But, although President Roosevelt announced in connection with the captive mine dispute that no government agency would force a man to join a union against his will, government agencies were reluctant to deal firmly with the question and at the close of 1941 it remained unsettled.

Pressure for higher wages was the other source of strikes and knotty labour problems. During 1941 industrial wages were raised approximately 15% and were higher than at any time in the history of the country. All unions joined in demands for greater rates of pay, but the C.I.O. usually took the initiative. Concessions won by C.I.O. unions in the coal, steel, automobile and aviation industries fixed the amount of the increase in wages that prevailed in the spring of the year at about 10 cents an hour. In the railroad industry an affirmative strike vote taken by the railroad unions was followed by the appointment of a railroad fact-finding board, as provided in the Railway Labor act of 1934. This board recommended increases averaging 12.5%. But the findings of the board were rejected by the unions, which ordered a strike of all railroad employees in December. This action brought about the resumption of negotiations, which terminated in an agreement to raise railroad wages some 15%. Rapidly rising wages and expanding employment, coupled with the considerable potential decline in the volume of goods available for civilian use, aroused general fears of inflation and some demand for a government wage policy. But the administration was unwilling to support any measures for the control of wages and, at the close of 1941, the wages question, like the closed shop, was left unsettled.

Accompanying the movement for the closed shop and higher wages was the continuance of the campaign, initiated in 1940, for greater labour participation in public defense agencies and in the management of industry. Philip Murray, president of the C.I.O., pushed on with his demand for industry councils, made up of employers, labour and public officials and charged with facilitating war production. An associate of Murray's, Walter Reuther, an officer of the United Automobile Workers, went a step further by proposing that his union be authorized to survey the automobile industry and submit a plan for converting the industry from automobile to munitions production. This proposal, generally known as the Reuther plan, was firmly opposed by employers as only another method of arriving at Murray's plan for industrial councils. All such proposals were anathema to employers since they considered them subtle attempts to weaken the authority of management. Neither the Murray nor the Reuther plan was formally adopted, but they served the purpose of enhancing the prestige of organized labour and keeping alive the issue of the proper relationship between management and unions.

Within the two federations of labour—the C.I.O. and the A.F. of L.—there were during 1941 difficult problems of internal policy. In the C.I.O. these turned on the alleged efforts of John L. Lewis to return to power in that organization. The issues of this political struggle assumed a variety of forms, but they all came to a head at the annual convention of the C.I.O. in November. On purely industrial matters, such as the strike of the captive coal mines and the support of the construction workers' union, the convention backed Lewis's policies. But he received little aid and comfort from a resolution, unanimously adopted, that strongly endorsed the foreign policy of the Roosevelt administration. Lewis's well known anti-war and noninterventionist sympathies apparently had won few adherents among the C.I.O. unions. Whether Lewis had hoped to be recalled to the presidency of the C.I.O., which he had surrendered the year before, may never be known. But the convention showed little interest in his candidacy, and the re-election of Philip Murray to that post was from the outset a foregone conclusion. Similarly the expected candidacy of Lewis's daughter for the office of secretary-treasurer failed to materialize. When the convention adjourned the anti-Lewis forces were in complete control of the C.I.O.

In the A.F. of L. the supreme political issue of the year was concerned with the relation of the parent body to its constituent unions. This was an old and knotty problem of a loose central organization like the A.F. of L. It appeared at the annual convention of the federation in connection with the trial and conviction of George Browne, president of the union of theatrical stage employees and vice-president of the A.F. of L., and his Hollywood representative, William Bioff, for taking bribes from moving picture companies. Since the federation had always been slow to discipline officers of affiliated unions, this case proved highly embarrassing. It was all the more so because Browne, as vice-president, was one of the highest officers of the federation and because the A.F. of L. had been roundly attacked in the newspapers for failing to clean out corrupt officials and reform undemocratic procedures among its constituent organizations. The convention took no general action on the question, but it solved its immediate problem by reducing the number of vice-presidents from 15 to 13, thereby vacating Browne's office.

Until the Japanese attack on Pearl Harbor, the C.I.O. and A.F. of L. carried on their competition and interunion raids. The biggest fight of the year was in the effort of both organizations to unionize the employees of the International Harvester company. The A.F. of L., over the protest of the C.I.O., succeeded in blocking the reappointment of Edwin S. Smith to the Labor Relations board. But, though it complained much, it was not clear that the C.I.O. suffered from the changes in the board's membership. The entrance of the United States into the war in December soon produced more friendly relations and an informal truce between the two federations.

In spite of strikes and political disturbances, the unions gained close to 1,000,000 members in 1941. Aggregate union membership at the end of the year was not far from 10,000,000, or twice the membership reached in the boom months of 1920. All unions shared in these gains. But the most spectacular advances were made by the C.I.O. when its unions terminated their long fights against Ford and Bethlehem Steel and won contracts with these companies. As a result of these successes, the C.I.O. had achieved virtually complete unionization of the automobile and steel industries. [*See* also AMERICAN FEDERATION OF LABOR; BUSINESS REVIEW; CONGRESS OF INDUSTRIAL ORGANIZATIONS; DEFENSE, NATIONAL, (U.S.): *Labour;* DE-

FENSE MEDIATION BOARD, NATIONAL; LAW; NATIONAL LABOR RELATIONS BOARD.] (L. Wo.)

Great Britain.—At the end of 1940, the 223 trade unions affiliated with the British Trades Union congress had a total membership of 5,079,000, as compared with 4,867,000 at the end of the previous year. The number of trade unionists thus continued to rise, but much less rapidly than it rose during World War I. The principal increases were in the trade unions catering to metal workers; and in this group membership rose from 861,000 to 973,000. These increases were a natural outcome of the rise in employment in the industries making munitions of war. What is surprising is that there was no corresponding increase in the general labour unions, which cater to the less skilled workers in a wide variety of occupations. In the miscellaneous transport and general labour group membership rose only from 1,150,000 to 1,166,000, increases among the less skilled munition workers being largely offset by declines in trades adversely affected by the war. Changes in other groups were relatively small; a high proportion of the workers who entered the war trades remained unorganized. There was a marked increase in the spread and activity of shop stewards' movements, especially after the German invasion of the soviet union.

The annual Trades Union congress was held in Sept. 1941, at Edinburgh. The congress was notable for the narrow defeat of two resolutions critical of the policy of the general council. The more important of these debates took place on a resolution calling for a full inquiry into the basis of trade union organization, with a view to its adaptation to meet the needs of post-war development. A special report was presented on the attempts of the general council to secure repeal or revision of the Trade Union act of 1927, which was passed following the general strike of 1926. The trade unions at first tried to get the Churchill government to agree to drastic revision of this act, which was keenly resented. This claim was met by a sharp refusal from the prime minister, on the ground that any such legislation would be highly controversial. At the congress it was decided that consultations should take place between representatives of the unions and of the Conservative party, in the hope of getting agreement to modify the sections of the act preventing the affiliation of the Civil Service unions with the Trade Unions congress, and prohibiting local authorities from making trade union membership a condition of employment. Discussions with the Conservative representatives were started, but did not, in 1941, produce any result.

All government departments connected with the war effort had some advisory machinery on which the trade union movement was represented, usually with a parallel representation of the employers.

The year was one of almost unbroken industrial peace. There were no major strikes or lockouts, and the small disputes which did occur were almost all of brief duration. The most serious trouble arose at certain ports where changes in the handling of labour designed to secure more regular work and easier transferability of dockers led to local resentment, complicated by a conflict of policy between rival unions. Apart from this, there were a number of small stoppages at aircraft and other munition factories, largely arising out of the refusal of managements to recognize trade unionism or to deal with shop stewards or similar workshop organizations, and often involving allegations by the workers that their labour was not being applied with full effectiveness. Most of these troubles were confined to single establishments, and were soon settled. In general, trade unionists, including both officials and rank and file members, actively supported schemes for the dilution of skilled labour and even during the period of communist opposition gave almost solid support to the war effort. After the nazi attack on the soviet union, the communists rapidly changed front and became the vehement advocates of higher production; but the general council of labour refused to make any change in its opposition to communists and communist-controlled bodies, and the Trades Union congress endorsed this attitude. A number of local trades councils, suspected of being under communist influence, had their recognition by the congress withdrawn, or were induced to reorganize themselves by threat of such withdrawal. But these cases were not numerous; and in general the communists were making little or no headway. When the soviet union entered the war the communists threw themselves energetically into the shop stewards' movement, to use it for speeding up war output, and under the changed conditions their local influence tended to increase. But they were not numerous; nor did they stand for any distinctive policy. (G. D. H. C.)

Labrador: *see* NEWFOUNDLAND AND LABRADOR.

Lacrosse. The year 1941 in lacrosse centres was marked by the return to top strength of the consistently great Johns Hopkins university team of Maryland. A year before, Hopkins was a notch beneath top place University of Maryland in the U.S. At the same time one of the surprises of the year was the unexpected strength of Dartmouth and Syracuse. For the first time in its history this game, which was originated by the American Indians themselves, began to gain popular favour in the middle west of the U.S. Johns Hopkins, one of the oldest lacrosse centres in the world, came through an undefeated season and crowned this achievement by defeating the Mt. Washington club, the first time the latter had been set back in two years.

As for the spread of the game in the middle west, Kenyon college, Oberlin and Michigan put teams on the field and their performances were well received by the public.

The annual north-south lacrosse game was won by the southerners with a 7 to 6 victory.

Rear Admiral Russell Willson, superintendent of the Naval academy, said that Navy would play every team on its schedule regardless of the fact that its material had been depleted by the shortening of courses because of World War II.

There was a definite trend toward women taking an active interest in lacrosse, with more girls' college and club teams participating in competition than ever before.

Women's teams from Boston, Baltimore, Philadelphia, Westchester and New York participated in the national women's lacrosse tourney at Adelphi college, Garden City, L.I. over the Memorial Day weekend. (T. J. D.)

Laffoon, Ruby (1869–1941), U.S. politician and governor of Kentucky from 1931 to 1935, was born Jan. 15 at Madisonville, Ky. During his term as governor, Laffoon created 2,368 Kentucky "colonels," among whom were Mae West, Jean Harlow, Mary Pickford, Charles Chaplin, Jack Dempsey and Clark Gable. Faced with a serious strike among miners in 1932, Laffoon was forced to call out the militia on several occasions to keep order. He died in Madisonville, Ky., March 1.

La Guardia, Fiorello Henry (1882–), U.S. politician, was born in New York city, Dec. 11. He went to high school in Prescott, Ariz. From 1901 to 1906 he served in U.S. consulates in Hungary and Austria. He graduated from New York university law school in 1910. He was congressman from New York, 1917–21 and 1923–33. He commanded the U.S. flying force on the Italian front during World War I. In 1919 he was president of the New York city board of aldermen. In 1929 he was defeated for mayor of New York city, but was elected in 1933 after a three-cornered fight; he was re-elected in 1937 and again in Nov. 1941. In Aug. 1940, Pres. Roosevelt appointed him chairman of the U.S. section of the Canada-United States permanent joint board of defense, and in May 1941 the president named him director of the Office of Civilian Defense (*q.v.*). La Guardia resigned the directorship on Feb. 10, 1942.

Lamberton, Robert Eneas (1886–1941), mayor of Philadelphia, was born Sept. 14 near South Bethlehem, Pa. After receiving his law degree from the University of Pennsylvania, he began practice in Philadelphia in 1911. He was a member of the common council, 1916–20, and was sheriff of Philadelphia county, 1920–24. He served as a judge in the common pleas court from 1931 to 1939 but left the bench before his full term expired to run for mayor in Nov. 1939. After his victory at the polls, Mayor Lamberton instituted the wage and income tax designed to ease the city's debt burden. He died at his summer home in Longport, N.J., Aug. 22.

Land Banks: *see* FEDERAL LAND BANKS.

Langmuir, Arthur Comings (1872–1941), U.S. research chemist and authority on glycerine and shellac, was born Feb. 7 in Evanston, Ill. He studied at the school of mines, Columbia university, and at Heidelberg university, where he received his Ph.D. degree in 1895. He then became assistant to Prof. C. F. Chandler of Columbia university, 1895–96. From 1898 to 1900 he was instructor at Pratt institute and for the next 20 years he was chief chemist for a Brooklyn (N.Y.) glycerine and shellac firm. Dr. Langmuir formulated methods for analysis of shellac and glycerine which won him world recognition. In 1910 he was chairman of the American Chemical society commission, London, and was a member of various scientific societies in the United States and Great Britain.

He established the American Chemical Society prize, a $1,000 award given annually to young research chemists working in U.S. universities. His brother, Irving Langmuir, won the Nobel prize in chemistry in 1932. Dr. Langmuir died May 14, at his home in Hastings-on-Hudson, N.Y.

Lanman, Charles Rockwell (1850–1941), U.S. Sanskrit scholar, was born July 8, in Norwich, Conn. He was a professor of Sanskrit at Harvard from 1880 until his retirement in 1926, when he became professor emeritus. In academic circles he was widely known as a leading authority of oriental literature and culture and was actively connected with many learned societies. He was a lineal descendant of Francis Cook and John Alden. Dr. Lanman died in Boston, Mass., Feb. 20. (See *Encyclopædia Britannica.*)

Laos: *see* FRENCH COLONIAL EMPIRE.

Lapointe, Ernest (1876–1941), Canadian statesman, was born Oct. 6 in St. Eloi, Quebec. He was a member of parliament, 1904–1941, and minister of justice, 1924–30 and 1935–41. Lapointe was also a member of the Canadian delegation to the imperial conference in London, 1937, and was made a member of the privy council of the United Kingdom in the same year in recognition of his services to the empire. A close friend of Prime Minister Mackenzie King, Lapointe supported Canada's entry into war in 1939, but he opposed conscription as he had in 1914. He died in Montreal, Nov. 26. (See *Encyclopædia Britannica.*)

Lasker, Emanuel (1868–1941), German chess player, born Dec. 24 at Berlinchen, Germany, was the world's chess champion from 1894 to 1921. He studied mathematics at the universities of Berlin and Goettingen, and received the degree of doctor of mathematics at Heidelberg in 1897. He learned to play chess at the age of 12 and made a serious study of the game under the guidance of his older brother, Berthold. Barely 21, he attracted the attention of the chess world by defeating Feyerfeil at Breslau and earned the title of German master of chess. A series of successes followed and in 1894 he challenged Wilhelm Steinitz, holder of the world's championship for 28 years. Lasker won a decisive victory and in a return match two years later he won even more conclusively. Lasker finally ceded his crown to a young Cuban, José R. Capablanca, in 1921. Critics praised the master's calm and objective judgment and his extraordinary self-possession under the severe strain of a game. He founded a chess magazine in 1904, and wrote numerous manuals and essays on chess, mathematics, history and philosophy. He died Jan. 11 in New York city.

Latin America: *see* ARGENTINA; BOLIVIA; BRAZIL; BRITISH GUIANA; BRITISH HONDURAS; CHILE; COLOMBIA; COSTA RICA; ECUADOR; FRENCH COLONIAL EMPIRE; GUATEMALA; HISPANIC AMERICA AND WORLD WAR II; HONDURAS; NICARAGUA; PANAMA; PARAGUAY; PERU; SALVADOR, EL; SURINAM; URUGUAY; VENEZUELA.

Latter Day Saints: *see* MORMONS.

Latvia. One of the Baltic states of northeastern Europe, north of Lithuania, south of Estonia, formerly a republic; in 1941 it became part of the German "Ostland." Area, 25,016 sq.mi.; pop. (est. Jan. 1, 1939), 1,994,500. Capital, Riga (385,063 in 1935); the other principal city was Liepaja (57,098). Language, Latvian. Religion, Christian (Protestant, 56%; Roman Catholic, 24·5%; Greek Catholic, 9%; Greek Orthodox, 5·5%). The country was ruled, after the German occupation in 1941, through Reichscommissar Heinrich Lohse.

History.—Like its neighbours Estonia and Lithuania (*qq.v.*), Latvia was buffeted in 1941 by the strife between the U.S.S.R. and Germany. From June 1940 to June 1941 Soviet Russia controlled the country and started its program of collectivization. Even before the Russians occupied the country, forestalling the Germans, most of the Germanic "Balts" had been repatriated in Germany or Poland. The period of soviet occupation, coinciding with straitened circumstances everywhere, sufficiently embittered the people so that some at least welcomed the nazi invasion in June 1941, and thought that Latvia might attain autonomy. Evidently less damage was done in the occupation of Latvia than in either of the neighbouring states.

However, the Germans soon began to treat Latvia as a conquered province. Branches of German banks such as the Commerz bank, the Dresdner bank and the Bank der Deutschen Arbeit were established in Riga, and heavy demands for export of agricultural produce to Germany were reported. Horses were taken from Riga cab drivers and sent to do farm work, while people from 16 to 60 were required to register with the German labour office. What measures were permanent and what were merely for wartime emergency was not evident, but toward the end of 1941 all the Baltic countries were being organized into the "new order."

Statistics of education, finance and economic conditions ceased to be issued in Latvia after the soviet occupation in 1940; the latest available figures at the end of 1941 applied for the most part to 1938 and 1939.

Education.—In 1938–39 there were 1,895 elementary schools with 229,825 pupils and 114 secondary schools with 25,225 pupils. Enrolment at the University of Riga was 7,281.

Finance.—The monetary unit is the lat (=19.3 U.S. cents at par, established as equivalent to the Swiss franc in 1921). Effects of German control were still uncertain at the end of 1941. In 1939 the budget estimates envisaged revenue of 190,878,000 lats and expenditures of 190,481,000 lats.

Trade and Communication.—Imports in 1938 were 227,336,000 lats; exports 227,204,000 lats. Chief articles of import were industrial machinery, agricultural machinery, automobiles and accessories, coal, cotton textiles, cotton (raw) and wheat. Chief articles of export were timber, flax, plywood and butter. Exports went chiefly to Great Britain, Germany, the U.S.S.R. and the Netherlands. Imports were primarily from Germany, Great Britain, the U.S.S.R., Sweden and the United States. In 1940 the Latvian state railways operated over 2,200 mi.; bus lines over 2,800 mi. The principal harbours are Riga, Liepaja and Ventspils.

Agriculture.—The principal crops with their yields (in short tons) were as follows in 1939: rye, 493,830; barley, 245,041; oats, 534,395; wheat, 233,247; potatoes, 1,807,882; flax, 54,123. Livestock included 414,470 horses, 1,271,730 cattle, 1,469,570 sheep, 891,470 pigs, 4,729,120 poultry, 222,460 beehives.

Manufacturing.—After the decline in 1931 and 1932, Latvia's industrial production rose rapidly to a general index figure of 148 in 1937 (based on 100 in 1930). Strong efforts were made up to 1939 to increase the self-sufficiency of the country.

At the beginning of 1939 some 5,970 industrial establishments employed 98,500 persons, and in 1938 produced a value of 695,000,000 lats. Chief industries were foodstuffs, wood and paper and textiles. (F. D. S.)

Laughlin, Clara Elizabeth (1873–1941), U.S. travel writer, was born Aug. 3 in New York city. After graduating from high school in Chicago in 1890, Miss Laughlin edited a religious weekly. From a skimpy budget of $20 weekly for original material she managed to save $25 and sent it to James Whitcomb Riley for "$25 worth of poetry." Riley responded with a poem a "half a yard long," and the two struck up a fast friendship. In the early 1900s, she wrote a number of novels, the most famous of which is *Felicity* (1907). She wrote *Foch, the Man* (1918) and *The Martyred Towns of France* (1919). She had travelled extensively in Europe before World War I, but it was not until 1924 that she launched into her career as travel writer. In that year her first travel book, *So You're Going to Paris*, met with such success that she wrote a series of travel works, all starting with the title "So You're Going to. . . ." She also founded and directed a travel service. Miss Laughlin died in Chicago, March 3.

Laughlin, Irwin Boyle (1871–1941), U.S. diplomat and steel executive, was born April 26

in Pittsburgh, Pa. Laughlin renounced an executive position in the Jones & Laughlin Steel company, which was founded by his grandfather, to become private secretary to the U.S. minister in Japan, a post he held from 1903 to 1905. In 1906 he was named second secretary in the American legation in Tokyo. After serving in various U.S. consulates and embassies in the far east and Europe, he was appointed minister to Greece, 1924–26. Laughlin was ambassador to Spain from 1929 to 1933. He died in Washington, D.C., April 18.

Lauri, Lorenzo (1864–1941), Italian cardinal and chamberlain of the Roman Catholic church, was born Oct. 15 in Rome. During his tenure as papal nuncio to Poland, he was instrumental in negotiating the concordat in 1925 between the Vatican and the Warsaw government. Mgr. Lauri, who also served as nuncio in Chile, Peru and Spain, was made a cardinal in 1926 and was grand penitentiary, prior to his promotion in 1939 to the office of chamberlain, highest administrative post under the pope. Cardinal Lauri administered the treasury as well as the properties and temporal rights of the Holy See. He died Oct. 8 at Rome.

Laval, Pierre (1883–), French statesman, was born June 28 at Châteldon, Puy-de-Dôme. For a brief biographical sketch, see *Encyclopædia Britannica*. Laval had remained in comparative obscurity after the start of war in 1939 until he was delegated by Marshal Pétain to draft a new constitution July 5, 1940, after the downfall of France. A week later Pétain named him his successor as well as vice-premier. During the succeeding weeks Laval, who had obvious pro-nazi inclinations, made several visits to Paris and occupied France to consult with Hitler (Oct. 22, 1940, near Compiègne), Goering and other high German leaders. As early as September a rift was reported between Pétain and Laval, and on Dec. 13 the latter was abruptly dropped from the Vichy cabinet and temporarily interned. The Germans, through High Commissioner Otto Abetz, then apparently intervened on behalf of Laval and secured his release, though Pétain did not restore him to his former high offices.

The marshal offered to reinstate Laval early in 1941 as a minister of state, but Laval declined. During the rest of the year he did not figure very prominently in the affairs of Vichy France. On Aug. 27 a young Frenchman, Paul Colette, shot Laval and Marcel Déat and wounded both during a parade of the French Legion of Volunteers to Combat Bolshevism, in Versailles. Laval recovered and was able to leave the hospital Sept. 11. In October, Pétain commuted Colette's death sentence to life imprisonment.

Lavery, Sir John (1856–1941), British painter, was born in March in Belfast, Ireland. He was elected president of the Royal Society of Portrait Painters in 1932 and was a member of the academies of Antwerp, Milan, Rome, Brussels and Stockholm, the Société Nationale des Beaux-Arts of Paris, the Society of Spanish Artists in Madrid and the Secessions (art groups formed in the late 19th century to protest against academic qualities in art) of Berlin, Vienna and Munich. In Nov. 1918 he was invited by the admiralty to visit the grand fleet and sketch the surrender of the German navy at Scapa Flow. George Bernard Shaw and Steve Donoghue, famous English jockey, were among those who sat for Sir John, and his canvas of Cardinal Hayes of New York is at Fordham university, New York city. His portrait of an "Irish colleen," the model for which was his American wife, appears on the paper currency of Eire. He was the author of one book, *Life of a Painter* (1940). Sir John died Jan. 10 in Kilmoganny, County Kilkenny, Eire. See his biography in *Encyclopædia Britannica.*

Law. The year 1941 saw the transition from a defense to an all-out war economy with all its far-reaching implications. While domestic controls were tightened, particular attention was concentrated upon four main phases: (1) Production, which, through priorities, allocations and requisitions converted the market from a buyers' to a sellers' market; (2) price control, which, through a determination of price ceilings was desperately attempting to stave off the inflationary spiral toward which U.S. economy appeared to be headed; (3) labour, whose jurisdictional feuds and inability to agree with management brought on the creation of an all-powerful War Labor board; (4) taxation, to provide for the billions which must be expended in the total war effort.

The many fields of the law, however, were not neglected by judicial decisions or administrative orders. These, selected because of their relative importance or their significance as trends, are briefly reviewed under the following titles:

ADMINISTRATIVE LAW
AGRICULTURE
Legislation
ARBITRATION
BANKING
BANKRUPTCY
CIVIL RIGHTS
CONSTITUTIONAL LAW
CONTRACTS
COPYRIGHT
CORPORATIONS
DOMESTIC RELATIONS
INSURANCE
LABOUR
Widened Federal Control
Immunity from Anti-trust Laws
Broadening of Labour Board's Power
War Labor Board
Rights of Labour
Rights of Management
Duties of Management
LIBEL
MORTGAGES
NATIONAL DEFENSE
Production Control
Government Contracts
Transportation
Price Control
Labour
Taxation
Consumer Credit Control
Trade Regulation
Freedom of Speech
Conscription
Civil Relief to Soldiers and Sailors
Commandeering
ALIENS
PATENTS
PUBLIC UTILITIES
SECURITIES
SOCIAL SECURITY
TAXATION
TORTS
TRADE REGULATION
Jurisdiction of the FTC

While national defense dominated the scene, as industry passed from civilian needs to military requirements, the many administrative boards normally concerned with peacetime endeavours doubled their efforts to justify their existence. The federal trade commission and the department of justice struck out after profiteering as well as fifth-column activity under the guise of dummy corporations, patent pools and other subterfuges to conceal ownership of American industries by enemy aliens. The labour board emphasized collective bargaining through appropriate units as essential to expeditious production on the assembly line. The Federal Communications commission, like the Securities and Exchange commission, began the decentralization of major monopolies: the FCC—divorcement of the major networks; the SEC—the liquidation of the gigantic holding companies. These and many other boards were vastly re-enforced by rulings of the United States supreme court (*q.v.*) reasserting their supremacy as fact-finding bodies in their respective domains. This review of the year begins, accordingly, with a brief consideration of the major principles announced by courts on the fundamental doctrines which govern these administrative tribunals.

Administrative Law.—Most administrative rulings are considered under their special category in this article, *i.e.*, labour, trade, securities, etc. Here are reviewed briefly only such general principles as permeate the entire field of administrative law, *i.e.*, the power of administrative boards—fact finding and rule making, and the conclusiveness of their holdings where not arbitrary and unreasonable.

Laws enforceable by administrative boards had latterly seldom been challenged. Any effort to contest them had been via constitutional rights, *i.e.*, undue delegation of authority to an administrative board; or assuming the authority was properly delegated, no fair hearing was granted by the board; or granted a fair hearing, the board overstepped its bounds in the particular order it issued. In *Lowell Sun Co.* v. *Fleming* (120 F. [2d] 213) invalidating a subpoena by a regional director ordering the production of works and records, the court held that the administrator alone may issue subpoenas, and he may not delegate this power since there is no express statutory authorization to do so. In the course of these cases the courts made it clear that one official might not examine the evidence and pass it on to another, who had not considered the evidence, to make find-

ings and issue an order. Any review of such a ruling, however, must be restricted to the record and the administrative officer (secretary of agriculture) should not be called to testify as to the mental processes by which he reached his conclusion. So long as opportunity to present evidence on defined issues was given, the appraisal of the uncertain factors involved was for the secretary and not the courts; and there was no disqualification for bias (*United States* v. *Morgan*, 313 U.S. 409, 61 Sup. Ct. 999, 85 L. ed. 928).

In *National Labor Relations Board* v. *Prettyman* (117 F. [2d] 786) the court held that by removal of proceedings from Ann Arbor, Mich. to Washington, D.C. without just cause, the labour board had denied the respondent due process of law in the proceedings upon which its order was based.

In *National Labor Relations Board* v. *Express Publishing Co.* (312 U.S. 426) the supreme court reviewed the permissible scope of a cease and desist order. In that case, in addition to an affirmative order to bargain, the NLRB ordered the respondent to cease and desist: (1) from refusing to bargain collectively with the authorized representative of its employees, and (2) from in any manner interfering with, restraining or coercing its employees in the exercise of their rights to self-organization, collective bargaining and other rights, all guaranteed by section 7 of the act. The circuit court decreed enforcement of the affirmative order only. On appeal, the principal question was whether the board's finding only of refusal to bargain and of the making of certain statements interfering with efforts to negotiate justified issuance of the broad cease and desist order (2) above. The supreme court held the board does not have authority under the Wagner act (sec. 10[c]) to enjoin all violations of rights guaranteed in section 7 of that act, merely because the unfair practice found under section 8(5) (refusal to bargain) is also a violation of section 8(1) (making an infringement of section 7 an unfair practice). Mr. Justice Douglas, joined by Justices Black and Reed, dissented.

Agriculture.—Milk regulations continued an important aspect of agricultural control. In *Stracquadanio* v. *Department of Health* (285 N.Y. 93), the New York court of appeals held that a health regulation limiting permits to milk distributors in business before June 1, 1939, does not violate the constitution. After an extensive survey had demonstrated that unsanitary practices were common among milk distributors who lacked their own pasteurizing facilities, the New York city board of health in 1939 amended its regulations to require permits from such distributors, but provided that a permit should not be granted unless the distributor was in business before June 1, 1939. The board refused a permit to the petitioner, who had not been in business on that date. Contending that he was denied equal protection of the laws, the petitioner sought a mandatory order that the board issue him a permit. On appeal from a denial of the petitioner's application, the court held that the regulation was constitutional as a reasonable attempt to prevent the increased difficulty of enforcement which might result from unlimited competition.

Held constitutional was a Minnesota statute requiring wholesale dealers in farm products to be licensed, to post a bond to insure payment to vendor farmers and to make reports to such farmers concerning the sale of produce (*Minnesota* v. *Marcus*, July 3). State and local taxes may not be assessed against land purchased by borrowers with proceeds of loans under the Bankhead-Jones Farm Tenant act after such land has subsequently been acquired by the United States through purchase at foreclosure sale or through acceptance of a deed in lieu of foreclosure. Liquor distillers were held not entitled to a return out of the United States treasury of money paid by them under marketing agreements which were made pursuant to the Agricultural Adjustment act, since the money which was to be utilized under terms of agreement for rental or benefit payments to farmers was not so used (*Stitzel-Weller Distillery* v. *Wickard*, 118 F. [2d] 19).

New regulations and rules governing procedure under the Perishable Commodities act and Produce Agency act were issued (including disciplinary proceedings) on June 17. The pattern embraced a fourfold classification: (1) rule-making proceedings; (2) reparations proceedings; (3) disciplinary proceedings; and (4) rate-making proceedings. A more detailed codification was provided on June 27, covering all procedural steps necessary in the administration of the Packers and Stockyards act, as well as procedure in disciplinary proceedings.

Legislation.—Agriculture Appropriation act, approved July 1, provided appropriations for the secretary and department of agriculture: (a) to make parity payments to producers of wheat, cotton, corn, rice and tobacco in accordance with section 303 of the AAA act of 1938; (b) to make payments to states, Hawaii, Alaska and Puerto Rico for agricultural experiment stations; (c) for disposal of surplus commodities; (d) to carry out the Sugar act of 1937; (e) to carry out the Farm Tenant act; (f) for loans, grants and rural rehabilitation; (g) for the Rural Electrification administration, the Farm Credit administration and other bureaus and services of the department.

Commodity Credit act (Steagall) approved July 1: (1) extended for two years the life of the Commodity Credit corporation, to June 30, 1943; (2) provided increase in amount of permissible outstanding obligations from $1,400,000,000 to $2,650,000,000; (3) directed the secretary of agriculture during emergency to encourage production of such agricultural commodities as he deemed necessary to the defense program, by making commodity loans through the Commodity Credit corporation. He was required to support the prices of such commodities to prevent their falling below 85% of parity.

Corn and Wheat Marketing Quota act approved May 26: (1) established as farm marketing quotas for wheat and corn the actual production of the acreage planted, less the normal or actual production (whichever is smaller) of the acreage in excess of the allotment granted; (2) directed the secretary to impose regulations as to excess production above prescribed marketing quotas, either for the farmer to store the excess or to deliver the excess to the secretary, or to pay a penalty based on the excess—the government retaining a lien on the whole crop until the penalty is paid, or crop is stored or delivered.

Marketing Quotas act, approved Dec. 26, amended the Agricultural Adjustment act of 1938 to be retroactive effective to May 26, by a new paragraph intended to modify the farm-marketing quota for wheat for 1941 and subsequent crop years to provide relief in the case of farms harvesting less than a normal crop.

Parity act, approved Dec. 26, extended to Jan. 1, 1947, the period within which the secretary of agriculture might carry out the purposes of the Soil Conservation and Domestic Allotment act by making payments and grants of aid to agricultural producers, prolonging until that date the life of the AAA soil conservation program and the 35% parity crop loans on cotton, corn, wheat, rice, tobacco and edible peanuts.

Sugar Quota act, approved Dec. 26, extended for an additional three years, until Dec. 31, 1944, the quota system set up by the Sugar act of 1937. (*See* also AGRICULTURE.)

Arbitration.—Arbitration played a significant role in commercial and industrial disputes, although as to disputes arising out of defense contracts the government denied the benefits of arbitration with respect to its own contracts.

The National Defense Mediation board (*q.v.*) was created on March 19, comprising representatives of the public, employees and employers. In the major tie-ups on defense production, however, the board was not successful in settling the labour disputes brought before it; hence the creation of the War Labor board in 1942 with power to compel arbitration and render final determinations in all disputes for the duration of the war.

Commercial arbitration saw its most signal achievement in the form of a consent decree against the big five motion-picture producers. The development of this technique, styled legislation by negotiation, and the primary enforcement of the decree procured by the assistant attorney general for the alleged violations of the antitrust laws were delegated to the American Arbitration association. By virtue of the decree only the defendants who had consented to the arbitration procedure were obligated to arbitrate all claims brought against them. The right to initiate arbitration proceedings was unilateral and could be invoked only by aggrieved exhibitors. However, no such exhibitor was compelled to arbitrate any dispute which he elected to try directly in a legal proceeding under the antitrust laws. If the exhibitor decided to arbitrate, however, he would be allowed to do so only if he agreed in advance to accept the award of the tribunal.

Banking.—The Federal Deposit Insurance corporation was held entitled, under the Missouri statutes, to an allowance for interest on a claim for an amount paid depositors of a closed state bank after approval of such claim by receiver, although no demand for interest was made at the time of filing and approval (*Federal Deposit Insurance Corp.* v. *Citizens State Bank of Niangua*).

Withdrawals made by a depositor after the termination of the bank's insured status under provisions of the Federal Deposit Insurance law, continuing in force for two years insurance on amount on deposit at the time of termination, are not chargeable against the amount of the insured deposit as long as such withdrawals do not exceed the amount on hand from new deposits (*Federal Deposit Insurance Corp.* v. *Winton*).

The consent of the state commissioner of banking required of state banks by statute as a condition to establishing branch banks need not be obtained by a national bank to entitle it to establish branch banks (*State Banking Commission* v. *Michigan National Bank*).

Bankruptcy.—The United States supreme court handed down a number of important decisions and made some significant interpretations of various provisions of the Bankruptcy act including provisions of the recently enacted Chandler act (Corporate Reorganization). In *Consolidated Rock Products Co* v. *Du Bois; Badgley* v. *Du Bois* (312 U.S. 510) the court considered the fairness of a plan for reorganization of a holding company and two subsidiaries. The plan of corporate reorganization eliminated the accrued interest claims of the bondholders of the subsidiary companies and provided for the issuance of bonds and stock in the new corporation in the face amount of the old bonds. Stockholders of the holding company were to receive stock in the new corporation for their old stock. In confirming the plan the trial court made no findings as to the specific value of the separate properties, or of the properties of the enterprise as a unit, nor did it take into account the amount or validity of a claim by the subsidiaries against the parent corporation under an operating agreement. In the absence of such valuation data, the supreme court held that no determination of the fairness of the plan could be made. The court held, though, that participation by the equity interests in any of the assets was precluded by the full and absolute priority rule "until the bondholders had been made whole," and that the relative priorities granted by the plan to creditors and stockholders did not satisfy that principle.

Back pay is a debt which may be proved in bankruptcy. In *NLRB* v. *Killoren*, trustee of Hamilton-Brown Shoe Co. (122 F. [2] 609) the NLRB ordered the shoe company to reinstate certain employees with back pay. Before the circuit court affirmed this order, the company filed a petition in bankruptcy and thereafter was adjudicated a bankrupt. The NLRB filed claim for the back pay award, which the referee and district court denied. The circuit court held that a back pay award is a provable debt entitled to priority as wages and may be properly filed by the NLRB in bankruptcy proceedings.

Civil Rights.—The supreme court of the United States on April 14 overruled the celebrated decision of that court handed down in 1918 wherein it held the Toledo Newspaper company, publisher of the *Toledo News Bee*, and its editor guilty of contempt because of the reasonable tendency of the contemptuous writing to obstruct justice. By statute, federal courts had power to punish contempts provided the contempt had been committed so near to the court as to obstruct the administration of justice. In *Nye* v. *U.S.* (313 U.S. 33) the district and circuit courts held defendants guilty of contempt when they induced a feeble-minded and illiterate plaintiff to drop his action. In reversing the conviction the supreme court held that the contempt, to be punishable, must be in geographical proximity to the court; mere relevancy to the work of the court is insufficient to sustain an action for contempt.

In another case (*Times-Mirror Co.* v. *Superior Court of California*, 62 Sup. Ct. 190) against the *Los Angeles Times* and its managing editor, the Los Angeles bar association initiated the proceedings on the theory that newspaper comment on litigation before it is finally determined, whatever the date of determination may be, has a tendency to obstruct justice. The *Times* defended itself in the lower courts and before the supreme court of the United States on the ground that the editorials presented no clear and

present danger to the administration of justice and that the reasonable-tendency test laid down in the Toledo newspaper case was not the proper test.

In a five-to-four decision the supreme court held that neither Harry Bridges, west coast labour leader, nor the *Los Angeles Times* may constitutionally be held in contempt of court, for their conduct, respectively, in (1) sending a telegram to the secretary of labour denouncing a court decision against Bridges; and (2) publishing editorials approving verdicts of guilty in still-pending prosecutions of sit-down strikes and of one active in local politics for grand larceny (*Bridges* v. *State of California*, 62 Sup. Ct. 190). (*See* also CIVIL LIBERTY.)

Constitutional Law.—Of outstanding concern in the realm of constitutional law was the issue of states' rights. A state statute regulating interstate transportation agents was held not to violate the commerce clause of the federal constitution. In *California* v. *Thompson* (313 U.S. 109) a California statute, violation of which constitutes a misdemeanour, required every transportation agent (defined as one who "sells or offers to sell or negotiate for" transportation over the public highways of the state) to procure a licence from the state railroad commission. The respondent was convicted under the statute for arranging, without a licence, the interstate motor vehicle transportation of passengers by one who made the single trip in question. In sustaining the conviction, the supreme court held that the statute is a valid exercise of the state police power, and an equally valid regulation of interstate commerce, in that it does not unnecessarily obstruct interstate commerce.

On the other hand a state regulation which is an unreasonable obstruction to the mobility of interstate commerce is a violation of the limitations imposed on the state's power by the commerce clause of the U.S. constitution. Such was a statute requiring filing of a surety bond before sale of out-of-state used cars (*State v. Ernst*, 297 N.W. 24 [Minn.]).

In *Hines* v. *Davidowitz* (312 U.S. 52) the supreme court considered the concurrent power of a state legislature. Pennsylvania passed a statute providing for the registration of aliens (*Pa. Laws*, 1939, no. 304, p. 652). The federal district court enjoined enforcement of the act on the grounds that it denied aliens equal protection of the laws, and that it encroached upon powers vested in the federal government. In 1940, after the district court had enjoined enforcement of the state act, congress passed the federal Alien Registration act. On appeal the supreme court affirmed the judgment of the district court (three justices dissenting). The Pennsylvania act cannot be enforced because congress by adopting a comprehensive, integrated scheme for registration of aliens, including its 1940 registration act, has precluded state action such as that in this case.

A state has the power to enjoin unfair labour practices of employees in industries engaged in interstate commerce. In *Allen-Bradley Local No. 1111, United Electrical, Radio and Machine Workers of America* v. *Wisconsin Employment Relations Board* (295 N.W. 791 [Wis.]) the defendant union and certain of its members were found guilty of unfair labour practices as defined by the Wisconsin Employment Relations act. The labour board issued a cease and desist order, which was sustained by the lower court, despite the defendant's contention that the statute was unconstitutional on the ground that congress had precluded such state legislation affecting interstate industries by enacting the National Labor Relations act. The court, holding for the plaintiff, ruled that state legislation not repugnant to the Wagner act is operative in this field so long as the National Labor Relations board has not acted in the particular matter.

Contracts.—Since the government had become the largest customer in the world, the supreme court's interpretations of public contracts was of particular importance. In *U.S.* v. *Cowden Mfg. Co.* (312 U.S. 34) a clause in the public contracts provided for reimbursement of any taxes "made applicable directly upon the production, manufacture or sale of the supplies covered by this contract." A contractor sought to recover taxes imposed under the Agricultural Adjustment act on the contractor's subcontractors, but borne by the contractor. In denying him recovery the supreme court concluded that the federal taxes clause did not obligate the United States to reimburse the contractor, who was to supply a certain kind of mechanic's suit, for the processing taxes imposed on sellers to the contractor and borne by the contractor under an agreement with the subcontractor.

The Miller act gives materialmen and labourers a right of action upon the payment bond if they had a direct relationship with a subcontractor but not with the contractor furnishing the bond, upon the giving of written notice to the contractor within 90 days from the date on which the person did or performed the last of the labour or furnished or supplied the last of the material for which the claim is made. The statute prescribes that such notice shall be served by mailing the same by registered mail to the contractor, "or in any manner" in which the United States marshal of the district in which the public employment is situated is authorized by law to serve summons. The materialman sent the notice by ordinary mail to the government project engineer, who admitted actual receipt. The supreme court holding that this mailing complied with the notice and provision of the act ruled that the statute be given a reasonable construction in order to achieve its remedial purpose (*Fleischer Engineering & Construction Co.* v. *Hallenbeck*, 311 U.S. 15).

In the general realm of contracts, the New York supreme court decided that an agent who contracts for bribes with a party adverse to his principal is accountable for any commissions received. He is also ordinarily barred from enforcing the illegal contract against the third party. In *Rush* v. *Curtiss-Wright Export Co.* (175 Misc. 873, 25 N.Y.S. [2d] 597) the government of Colombia offered X a position as purchasing agent, inspector and aviation defense adviser. He accepted after the defendant aviation company promised him commissions and bonuses on all sales made to Colombia. The court found that X did not inform Colombia of this agreement. X's assignee brought suit for the commissions due; Colombia did not enter the action. The court held that the plaintiff could recover although the contract was illegal, but only as constructive trustee for Colombia.

Copyright.—A unanimous decree of the U.S. circuit court of appeals at Los Angeles upheld a decision of the district court that recordings can be made of any literary works and sold for commercial purposes without royalty payment as long as such works are not dramatized. In *Corcoran* v. *Montgomery Ward & Co.* (121 F. [2d] 572) the plaintiff charged defendant with recording and selling his original copyrighted poem, "Plain Bull," thereby committing an infringement of copyright. The court, although conceding the justice of plaintiff's claim, pointed out that in the 1909 revision of the Copyright act, composers were given the exclusive right of recording their musical compositions and the same right was granted to authors of copyrighted dramatic works. However, congress did not give like protection to copyrighted poems, stories and similar literary material.

Corporations.—The court refused to impede the industry-wide regulation of coal producers by exempting wholly-owned subsidiaries of the great industrial consumers seeking to assure their fuel supply. In *Keystone Mining Co.* v. *Gray* (120 F. [2d] 1) the Delaware, Lackawanna and Western railroad took the entire output, with unimportant exceptions, of the Keystone Mining company, a wholly-owned subsidiary. Keystone and Lackawanna had a common treasurer, two common directors and some common employees. While Keystone's books were kept separately, they were maintained in Lackawanna's offices. General policy was determined in consultation with the president of Lackawanna, but Keystone did its own purchasing and hiring and firing, paid its own taxes and made its own decisions. The National Bituminous Coal act states that its provisions "shall not apply to coal consumed by the producer, or to coal transported by the producer to himself for consumption by him." Keystone appealed from the denial of its petition for exemption. In affirming the order, the court held that Keystone cannot be considered the agent or the instrumentality of Lackawanna so as to exempt it as a consuming producer.

In *Matter of the Grand Jurors Ass'n, Bronx Co., N.Y., Inc.* (25 N.Y.S. [2d] 154) after several grand jury associations had been incorporated in New York and New Jersey, the Bronx County Grand Jurors association presented a certificate of incorporation to the supreme court for approval under sec. 10 of the New York Membership Corporation law. The association, consisting of past and present grand jurors, desired incorporation in order to promote the efficiency of the grand jury system and to advocate desirable changes in the criminal law. The court denied the certificate because the corporation might tend to influence the attitude of its members serving on grand juries, and because the name might cause confusion with the official grand jurors.

Domestic Relations.—The law of most states, Minnesota included, prevents a wife from bringing a civil suit against her husband for personal injury. In *Kyle* v. *Kyle* (297 N.W. 744 [Minn.]) the wife of the defendant alleged that while riding as a passenger in defendant's car over a Wisconsin highway she was injured in an accident occasioned by the defendant's negligence. Such an action may be maintained under the law of Wisconsin (place of the injury). In sustaining the defendant's objection to the complaint, the court held that since the well established law of the forum (place of trial) prevents a wife from bringing a civil suit against her husband for personal injury, it would be contrary to strong public policy to invoke the rule of comity and allow the enforcement of the action in Minnesota. Although full faith and credit does not require such holding, a foreign decree for future alimony may be established as the decree of the forum, subject to being altered if and to the extent that the foreign court later modified its original decree. In *Biewend* v. *Biewend* (109 P. [2d] 701 [Calif.]) the plaintiff received a valid divorce decree in Missouri whereby the defendant was ordered to pay weekly alimony. The plaintiff remarried, was divorced a second time, and then lived with defendant again for four years. Both parties having become domiciled in California, plaintiff brought an action to enforce the foreign alimony decree. Although California law denied the divorced wife the right to continued payments of alimony in case of her remarriage, the plaintiff was granted a judgment which was affirmed on appeal for the amount of the accrued unpaid alimony, and the defendant was ordered to continue his payments under the Missouri decree from the time of the California judgment.

In *Vernon* v. *Vernon* (262 A.D. 431, 29 N.Y.S. [2d] 736) the defendant wife, while domiciled in Nevada, procured an ex parte (uncontested) divorce. The plaintiff appeared after judgment and secured a modification of the decree with respect to the provisions for alimony and custody of their child. Upon the remarriage of the wife, the plaintiff, claiming that the Nevada decree should not be recognized, brought an action in New York for divorce on the grounds of adultery. Judgment for plaintiff was reversed on appeal. Although the original Nevada decree was invalid in New York, the modified decree entered subsequent to the appearance was binding on the plaintiff and entitled to recognition.

Legislation to require persons, seeking a marriage licence in Massachusetts to undergo a physical examination and blood test for syphilis was enacted by Massachusetts on July 29. An amendment to exempt persons whose religious beliefs opposed a blood test was rejected by a vote of 12 to 8.

Insurance.—The question of what law would determine rights under an insurance policy was considered by the U.S. supreme court in *Stoner* v. *N.Y. Life Ins. Co.* (311 U.S. 464). The insured was a citizen of Texas and the policy had originally been issued in New York. The principal beneficiary of the policy was originally a syndicate of business associates of the insured. Subsequently, upon termination of the business enterprises of the association, a new syndicate was formed with the sole objective of paying premiums on the policy which was changed to make the members beneficiaries, as a protection to them for money advanced to the insured. Other changes were made and the altered contract was endorsed by the insured in Texas and by members of the syndicate in New York. Thereafter some of the members of the syndicate assigned their interest in the policy to strangers to the original transaction.

The question was whether the law governing the insurance contract remained unaffected after the change in beneficiaries. The law of Texas required persons taking insurance on the life of another to have an insurable interest in that life. This requirement was not essential to the validity of a policy according to the law applicable to the original contract (*i.e.*, the law of New York). The United States supreme court held that the question whether collection of the proceeds of the policy would be barred by the public policy of Texas was a matter for the courts of that state to decide. A refusal by a state court to enforce a foreign contract, though valid where made, on grounds of public policy would not be an unconstitutional "extra-territorial control of contracts and regulation of business" (*Stoner* v. *N.Y. Life Ins. Co.*, 311 U.S. 464).

In *Maryland Casualty Co.* v. *Pacific Coal & Oil Co.* (312 U.S. 270) the injured person had instituted proceedings against the insured in a state court. While this case was pending, the insurance company brought an action against the insured and the injured claimant to determine the insurance company's liability under the policy. The court held that there was an actual controversy entitling the insurance company to a declaratory judgment under the federal statute, even though the company was not a party to the suit in the state court. To hold otherwise might result in contradictory interpretations of the insurance policy by the federal and state courts.

Labour.—Courts and the labour board continued to make laws amplifying the rights, immunities and duties of labour and labour unions as well as the rights and duties of management. But by far the most outstanding events on the labour front were: (1) Widened federal power to rule working conditions; (2) the supreme court's grant of immunity to labour from antitrust prosecution; (3) broadening of labour board's powers; and (4) the creation of the War Labor board.

Widened Federal Power.—The supreme court decisions on the Fair Labor Standards act went far beyond merely upholding the constitutionality of nation-wide regulation by the federal government of wages and hours. They made clear how few and unimportant, from a practical standpoint, were the remaining constitutional restrictions on governmental regulation of wages, hours and other working conditions. As a result of these supreme court decisions federal authority to regulate wages and hours may be exercised in seven ways which formerly were held obstructed by the constitution. The court ruled: (1) Prohibition of the shipment interstate of goods produced under labour conditions forbidden by the act is within the power of congress under the commerce clause; (2) fixing of wages and hours for employees engaged in producing goods for (interstate) commerce is within the federal power even though this regulation "involves control of intrastate activities"; (3) requirement that employers keep records of wages and hours is a constitutional means of enforcing a valid law, even as to records of intrastate transactions; (4) fixing of wage rates by the federal government is not a denial of due process of law under the 5th amendment; (5) fixing of maximum hours for men as well as women is likewise no violation of the 5th amendment; (6) the Wage and Hour law does not involve an unconstitutional delegation of the legislative power of congress; (7) industry committee and wage-rate fixing procedures need not be technical in order to avoid violation of constitutional requirements of procedural due process of law (*U.S.* v. *Darby Lumber Co.* 312 U.S. 100).

Immunity from Antitrust Laws.—A signal achievement of labour centred about its immunity from prosecution under the antitrust laws as well as freedom from injunction under the Norris-LaGuardia Anti-Injunction act. These laws, the Sherman and Clayton acts, prohibit agreements or combinations in restraint of interstate trade. For long it was insisted that restraints effected by labour groups did not come under the ban of these laws which were historically directed at combines of capital. Furthermore, the Norris-LaGuardia act barred injunctions where labour disputes were involved. In *U.S.* v. *Hutcheson* (312 U.S. 219) the supreme court declared a jurisdictional dispute is not subject to the Wagner act.

A pointed illustration inspired by the Hutcheson decision of how complete an immunity from prosecution of the antitrust laws labour enjoys is the case of *U.S.* v. *Local 807 of International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America* (118 F. [2d] 684). This case arose out of a demand by the defendant labour union members for payment of $9.42 for each truck unloaded. The claim was forced upon the truck operators "by actual violence to their drivers" and "by threat of such violence." The operators thereupon agreed to pay the money demanded but refused the defendants' "offer" to work in the place of the drivers regularly employed by the operators. This "offer" was interpreted as an invitation to management to "accept or else." Despite this fact, the court held that a labour dispute was involved and therefore the union could not be held either for violation of the antitrust acts or of the antiracketeering law.

The Hutcheson decision, however, did not grant labour carte blanche to violate the Sherman and Clayton acts. It merely decided that agreements between labour groups, even though in restraint of trade, are nevertheless valid. Where, however, the labour group goes beyond this restricted sphere of operation and joins with a nonlabour group (*e.g.*, manufacturers), the lower courts held that the unions might and should be prosecuted. In *U.S.* v. *B. Goedde & Co.* (40 F. Supp. 523), the union refused to install material manufactured in states other than Illinois and to erect prefabricated houses manufactured outside of Illinois, violently assaulted and beat labourers not affiliated with them, threatened violence and bodily harm to members of such persons' families, threatened to destroy property not labelled with the union labels, and forcibly prevented members of other labour organizations from working upon such material. For such acts the unions were held liable to antitrust prosecution or injunction. The immunity of the Norris-LaGuardia act did not apply, since there was no genuine labour dispute. The deciding feature was the fact that the unions had acted in concert with a nonlabour group.

On the other hand, a narrower construction was placed on the term "labour dispute" by the New York court of appeals. In *Opera on Tour, Inc.* v. *Weber* (285 N.Y. 348, 34 N.E. [2d] 349) the plaintiff, a travelling grand opera company, employed live singers but used recordings to produce the musical accompaniment traditionally supplied by an orchestra of instrumental musicians. The American Federation of Musicians, fearing the widespread use of the mechanical reproduction of recorded music, induced the Stagehands' union to order its members to refuse to work for the plaintiff. The six stagehands in the plaintiff's permanent employ struck, and because of the almost universal closed-shop conditions existing in theatres with respect to the Stagehands' union the plaintiff was forced to discontinue operating. In a suit to enjoin the Musicians' and Stagehands' unions, a decree of the special term granting the injunction was reversed by the appellate division in a three to two decision. On appeal to the N.Y. court of appeals, it was held (two judges dissenting) that the Anti-Injunction act does not apply where union activity is for an unlawful objective, and "for a union to insist that machinery be discarded in order that manual labour may take its place and thus secure additional opportunity of employment" is such an objective.

Broadening of Labour Board's Power.—A new era in the administration of the labour act was inaugurated by the supreme court's decision in *Phelps-Dodge Corp.* v. *NLRB* (313 U.S. 177). Not the courts, but only the board may determine matters of discretionary interpretation of the act, and only the board may exercise discretion to determine what "remedies" will effectuate the policies of the act.

In the first case wherein the U.S. supreme court had occasion to consider the board's power to determine the appropriate bargaining unit, it further extended the board's broad authority over matters of representation. In *Pittsburgh Plate Glass Co.* v. *NLRB* (313 U.S. 146) the NLRB proceeded against an employer under section 10(c) of the NLRA for unfair labour practices in refusing to bargain collectively after the board had found the appropriate bargaining unit to be six widely separated plants. The employer appealed on the ground that the board's action was arbitrary in view of the "desire" of a majority of the employees of one plant to be treated as a separate bargaining unit. In sustaining the order, the court held that scattered plants need not be considered individual units when there is identity of working conditions and centralization of management.

With *NLRB* v. *Barrett Co.* (120 F. [2d] 583) the investigatory powers of the NLRB appeared coextensive with those enjoyed by similar agencies under more happily worded statutes. In that case, charges of unfair labour practices having been brought against the defendant company, the NLRB sought to ascertain whether the defendant's operations affected interstate commerce. Upon the defendant's refusal to furnish records believed essential to this determination, the board issued a subpoena *duces tecum* for their production. The defendant refused to comply, contending that the board had no precomplaint power to investigate; whereupon the board obtained from the district court an enforcement order from which the defendant appealed. The court held that the power to subpoena extends to the investigation which is a necessary incident of the board's discretionary power of issuing a complaint.

In *NLRB* v. *Express Publishing Company* (312 U.S. 426), in a five to three decision, the authority of the labour board was seriously curtailed by the U.S. supreme court. Under this ruling the labour board may order companies to comply with provisions of the Wagner act only when unfair labour practices are actually found to exist. Mr. Justice Stone, writing for the majority, agreed that when one has been found to have committed acts in violation of law, he may be restrained from committing other related unlawful acts. But this general principle does not mean that an employer, once having unlawfully refused to bargain with his employees, shall for the indefinite future conduct his labour relations at this risk of being summoned by the labour board on a charge that he has discriminated against a labour union in the discharge of an employee.

Once a labour board order against an employer has been enforced by a court, the employer is subject years thereafter to penalty for contempt of the court's decree if he be found to engage in new unfair labour practices of the same general kind as those prohibited by the board's order. The mere fact that the employer engaged in no prohibited practices for a period of years intervening or that the later unfair labour practice is an entirely new one having no connection with the first is no defense. This was the ruling of the federal circuit court of appeals at New York in a contempt proceeding instituted by the labour board against an employer on the basis of a cease and desist order issued by the board nearly 3½ years before, sustained by the court nearly 3 years before, and complied with by the employer for more than 2 years prior to the new conduct which the board claimed in 1941 constituted a violation of the court's decree (*NLRB* v. *M. Lowenstein & Sons, Inc.*, 121 F. [2d] 675).

War Labor Board.—A new tribunal was added to the many charged with hearing labour disputes, the War Labor board. (*See* DEFENSE MEDIATION BOARD, NATIONAL.)

Rights of Labour.—The supreme court ruled in *H. J. Heinz Co.* v. *NLRB* (311 U.S. 514) that labour is entitled to a written agreement embodying a contract previously reached with the union, and the employer's refusal to sign constituted a refusal to bargain collectively. The high court also reiterated labour's right to picket (*Milk Wagon Drivers Union of Chicago, Local 753* v. *Meadowmoor Dairies*, 312 U.S. 287). However, picketing which is unlawful is not constitutionally protected according to the Wisconsin supreme court. Upon an employer's justified refusal to renew all-union shop agreement, the union called a strike and picketed the employer, advertising that both employer and employees were unfair to organized labour (under Wisconsin statute making it unfair labour practice for an employer to sign an all-union shop agreement except where at least three-fourths of the employees have voted in favour of it). The court held that the board's cease and desist order was proper; constitutional protection of peaceful picketing as an exercise of free speech does not extend to picketing, the purpose of which is unlawful (*Wisconsin Employment Relations Board* v. *Milk and Ice Cream Drivers and Dairy Employees Union, Local No. 225*, 299 N.W. 31 [Wis.]).

Secondary boycotts formerly held to be illegal in most cases since they involved the coercion of innocent third parties were approved where the court could find a unity of interest between the employer of the picketers and the party being picketed. In *People* v. *Muller* (286 N.Y. 281, 36 N.E. [2d] 206) defendants were charged with disorderly conduct for picketing a haberdashery shop in which a burglar alarm system had been installed and was being maintained by a company against which defendants' union was conducting a strike. The placards carried by defendants stated that the maintenance of the alarm was unfair to the union. The contract for maintenance was in force and not subject to renewal at the time, and no work was performed during the period of the strike. The court sustaining a judgment for the defendant, held that such picketing is lawful under the state Anti-Injunction act and is protected by the 14th amendment to the federal constitution.

The right to reinstatement was reaffirmed by the board despite the supreme court's limitations set forth in *NLRB* v. *Fansteel Metallurgical Corp.* (306 U.S. 240).

The labour board's interpretation of the Wagner act since that case, coupled with the strong support already won by the board in the appellate

courts, meant that the two-year-old supreme court decision was restricted to the exact facts of that case: a violent, protracted, sit-down strike involving seizure of the employer's property and discharge of the strikers. On ships as well as in factories the Wagner act was held to confer upon employees the "right" to strike and disobey commands of employer officers without risking discharge. The fact that this disobedience was in violation of a contract was held immaterial by the circuit court of appeals at Philadelphia in a case in which the ship was in port, although not its home port, at the time of the strike (*Southern Steamship Co.* v. *NLRB*, 120 F. [2d] 505). In affirming a labour board order commanding the reinstatement of saboteurs and participants in a strike conducted with violence, the circuit court of appeals at New Orleans decided that substantial evidence supports the board's finding that refusal to reinstate such strikers and saboteurs constituted an unfair labour practice (*El Paso Electric Co.* v. *NLRB*, 119 F. [2d] 581).

Under the Wage and Hour law, labour had been accorded the benefit of numerous favourable decisions extending the applicability of the law to types of employees heretofore never contemplated. The overtime provisions of the statute, however, were the subject of serious conflict of opinion between appellate courts. In *A. H. Belo Corp.* v. *Street and Fleming* v. *A. H. Belo Corp.* (35 F. Supp. 430) the administrator sustained the most serious reversal since the inception of the law. That case, subsequently followed by a number of others, held that employees who were receiving time and a half, their basic rate for hours in excess of the maximum, and a bonus representing the difference between the employees' earnings under the new agreement, and the amount they would have earned prior to the passage of the act, is compliance with the law, since what they received was in excess of the statutory minimum.

Rights of Management.—The supreme court in one of its most significant decisions since the passage of the Wagner act sanctioned the right of management to express "its views on labour policies or problems" without running the risk of violating the Wagner act. After the passage of that act the labour board steadily whittled down the right of management to express its opinion. The theory of the board was that the bargaining position of management was so much more powerful than labour's that intimidation necessarily followed the mere expression of an opinion by the employer (*NLRB* v. *Virginia Electric & Power Co.*, 62 Sup. Ct. 344).

In determining whether management had abused its constitutional right, by resorting to underhanded tactics under the guise of free speech, the labour board was empowered to "look at what the company has said as well as what it has done." But in so determining, the board might not speculate over the "imponderable subtleties at work," which it was not the function of boards or courts to appraise. The board must confine itself to findings of fact, not metaphysical speculation, and to evidence of interference, restraint or coercion, rather than an evaluation of subjective meanings.

On the other hand, the employer had the duty to co-operate in the matter of holding conferences. Unless employees accepted negotiations by mail, the employer had to make his representatives available for conferences at the plant where the controversy was in progress, and at reasonable times and places, so that personal negotiations were practicable. He was not permitted to impose financial hardship on the workers by insistence, for example, upon negotiations in New York city, even though his executive representatives were there (*NLRB* v. *P. Lorillard Co.*, 117 F. [2d] 921).

Duties of Management.—Negotiating and signing a contract with a union does not end an employer's bargaining duty under the Wagner act. The law imposes upon him the duty to negotiate with the union, also, regarding a dispute as to interpretation and application of the contract after it is signed (*Rapid Roller Co. 33 NLRB No. 106*, July 19). Requiring a performance bond from a union so as to render the union liable to legal action for failure to perform was held to be an unlawful refusal to bargain. Management cannot impose any condition precedent to this statutory duty (*Scripto Mfg. Co. 36 NLRB No. 85*, Oct. 27).

Refusal by an employer to embody in a contract a pledge to do what he is obliged by law to do may constitute a refusal to bargain. Evidence of refusal to bargain in good faith is found by the board to consist of: (a) issuance of contradictory instructions to the management bargaining representatives; (b) refusal to agree in advance to embody in a signed contract any understandings that may be reached; (c) failure to submit counterproposals at bargaining conferences on the ground that it is the union, not the company, that is seeking an agreement.

Libel.—The New York supreme court (appellate division) held that an unincorporated labour union was entitled to maintain an action against a newspaper for publishing a defamatory article charging corrupt conduct on the part of union officials. In *Kirkman* v. *Westchester Newspapers, Inc.* (24 N.Y.S. [2d] 860) Kirkman, individually and as president of local union no. 3 of the International Brotherhood of Electrical Workers, together with some 15 other union officials in their individual capacity, brought suit for an alleged libel published by defendants. The statements, claimed to be libelous, charged the union officers, as a class, with exacting oppressive initiation fees and dues from new members, and certain unnamed union officials with "feathering their nests." The court held (two judges dissenting separately) that the plaintiff union, though an unincorporated association, may maintain an action by its president for a libel injuring it in its business and credit; no cause of action, however, was stated in favour of the individual plaintiffs.

In a libel suit growing out of a dispatch based upon a "Washington Merry-Go-Round" column written by Drew Pearson and Robert S. Allen in Sept. 1939, and published in the *Clarksburg* (W.Va.) *Exponent*, a jury held that the column had printed the truth when it reported that Mr. Sweeney was the spokesman for Father Coughlin and that he had opposed the appointment of a foreign-born Jew, Emerich Freed, to the federal bench in Cleveland. In its charge the court reminded the jury that the *Exponent* had a public service to perform in reporting the news, particularly the news of Washington. "In so far as the 'Washington Merry-Go-Round' tells the truth or the substantial truth about the conduct of our president or other officials the 'Washington Merry-Go-Round' is furnishing not only interesting reading but is rendering an important public service," the court said.

Mortgages.—New York passed section 230-b of its Lien law. Prior to its enactment it was in most cases necessary for motor vehicle dealers to comply with section 230-a of the Lien law in order to execute a valid chattel mortgage.

Section 230-a of the Lien law requires the mortgagee to obtain from the mortgagor, a written list of the creditors of the mortgagor. He must then notify each of these creditors of the proposed mortgage and the terms and conditions thereof, when the mortgage is intended to operate as a mortgage upon a stock of merchandise in bulk, or any part thereof. Corporate mortgagors were also required to comply with section 16 of the Stock Corporation law. In effect this section provides that a stock corporation must first have consent to the execution of a mortgage from two-thirds of the holders of the outstanding voting stock, in writing, or by vote at a stockholders' meeting called for that purpose. A certificate that such consent was given must also be filed in each county in which the mortgage is filed. To satisfy these requirements each time a used car was financed proved not only cumbersome but expensive. As a practical matter, therefore, frequently the motor vehicle dealers failed to comply with the requirements of these sections, and more often did not file a chattel mortgage. Obviously, under such conditions, the mortgagee had no protection, whatsoever, not even against creditors of the motor vehicle dealer, to say nothing of the buyer in the ordinary course of trade.

The main purpose behind the passage of this statute, therefore, seemed to be to aid the financiers of used car dealers by providing a cheap, expeditious method of filing. At the same time the statute is also designed to protect bona fide purchasers for value in the regular course of business. Subdivision 6 of the statute provides: "A buyer in the ordinary course of trade, purchasing from a dealer any motor vehicle or motor vehicles covered by any such chattel mortgage or mortgages shall acquire such motor vehicle or vehicles free and clear of the lien or encumbrance of said chattel mortgage or mortgages."

National Defense.—The frenzied preparations for national defense and the all-absorbing effort to win the war added vastly to the controls exercised over practically every phase of U.S. existence. These are briefly reviewed under the following heads: production control, government contracts, transportation, price control, labour, taxation, consumer credit control, trade regulation, freedom of speech, conscription, civil relief to soldiers and sailors and commandeering.

Production Control.—War procurement injected into the economy sudden demands for machines and instruments of war. Because productive capacity at one stage in the production of a key product is often the factor limiting the production of a great range of products, new demands brought about the widespread construction of new productive capacity. Price rises which could not choke off the increase in military demands were met by increasing appropriations while civilian demands were outdone by price rises and by other measures to reduce purchasing power (consumer credit) at the points where it increased the demand for scarce supplies.

But the over-all increase in demand, price rigidities, and eventually price fixing adopted to lessen the burden on fixed income groups, prevented the price mechanism from assuring priority to military demands. Consequently the government was gradually forced to assume responsibility over a widening area of the economy to see that military demands got right of way over civilian needs, even if this meant government seizure and operation of factories.

The enforcement of war regulations were effectuated in the main through indirect sanctions since legislation was unable to keep apace of the rapidly developing events which precipitated the United States into World War II. To insure procurement of the necessary raw materials recourse was had to the technique of priorities, allocations and requisitions. (*See* DEFENSE, NATIONAL, U.S.)

Government Contracts.—To expedite industrial mobilization, the government was authorized to negotiate contracts through bargaining with individual producers. To avoid the possibility of collusion, computations are made on a cost-plus-a-fixed-fee basis and all estimates are carefully scrutinized. Letters of intention are issued by the war and navy departments when lengthy preparations are required "to inform manufacturers of the government's intention to place specified orders with them as soon as funds are appropriated or authorized." To expedite the acceptance of orders by contractors who have to borrow to meet government orders, provision was made for progress payments and advances. The government undertook to indemnify contractors who might be liable to suits for patent infringement as a result of using on government contracts processes not used in their normal operations. Educational orders enabled potential contractors to acquaint their personnel with the prospective work, thereby hastening the transition from peacetime to wartime operation.

Transportation.—Priorities in the shipping field were authorized by the Ship Warrants (Priorities) act, Public Law 173, 77th congress, approved July 14. The U.S. maritime commission is authorized to issue warrants affording certain vessels priority with respect to the use of facilities for loading, discharging and storage of cargoes, procurement of fuel, overhauling and repair.

Authority for the preference and precedence of the transportation of troops and war materials is vested in the president by section 6(8) of the Interstate Commerce act.

Price Control.—The most sweeping price control law in the history of the U.S. appeared when congress passed the Emergency Price Control act of 1942, approved by the president, Jan. 30, 1942. The legislation was primarily intended to avoid the tragic experiences of World War I resulting from inflationary spirals. To keep retail prices in check by force of law and not to rely upon mere voluntary agreements the administration-sponsored measure passed after a six months' battle, but not without two serious concessions to pressure groups: agriculture and labour. Under the new law an Office of Price Administration (*q.v.*) was set up with a one-man head known as the price control administrator.

Labour.—Though labour laws were somewhat relaxed, labour provisions continued as integral parts of government contracts and their violation was heavily penalizable. Under the first War Powers act of 1941, unlimited discretion is vested by executive order in the army, navy and maritime commission to disregard all present laws concerning government contracts

in making such contracts, amending them or settling claims under them. However, this wide discretionary power is limited by the Walsh-Healey act, the Eight Hour law, the Davis-Bacon act, the Kickback law, the Wage and Hour law and the Wagner act, all of which remain fully in force. A prominent instance of this relaxation of labour laws occurred when the president suspended the Eight Hour law as to persons employed by the government on army, navy and maritime commission contracts.

The rapid outbursts of strikes in defense plants brought about the creation of the National Defense Mediation board (*q.v.*). The Defense Mediation board, having no power to compel settlements of labour disputes, failed to relieve strike-bound plants. The result was the creation of the War Labor board, representing the public, management and labour, with absolute power to compel arbitration and to make final determinations in all labour disputes for the duration of the war. (*See* also general section on *Labour*, page 389.)

Taxation.—To aid in financing the huge cost of national defense and the lend-lease program, the Revenue act of 1941 approved Sept. 20 imposed new and heavier taxes designed to raise an additional $3,553,400,000 annually. (*See* TAXATION.)

Consumer Credit Control.—Under an act of Oct. 6, 1917, as amended, during the time of war or during any other period of national emergency as declared by the president, the president may regulate any transactions in foreign exchange, transfers of credit between or payments by banking institutions as defined by the president. A national emergency was declared by the president on May 27, 1941, and on Aug. 9, 1941, using the powers granted him by the 1917 act, an executive order was issued for the regulation of consumer credit. The order empowered the board of governors of the federal reserve system to regulate consumer credit in order to promote national defense and to protect the national economy. (*See* also CONSUMER CREDIT.)

Trade Regulation.—As part of the war effort, several devices were adopted for curbing fifth column and other enemy alien activity exercised through the guise of corporate controls, patent pools and monopolistic practices: (1) the blacklist, barring trade with known enemies, *e.g.*, Latin American and continental, known to be dummies for the axis powers; (2) dropping corporate officials and directors as in the case of General Aniline corporation; (3) prosecutions by the department of justice to break up attempted counterparts of the European cartel system, as in the production and marketing of hormone products, when four chemical corporations and five of their officials were fined a total of $54,000. By signing the consent decrees the companies agreed to cease the practices complained of, which included price fixing and dividing up world markets. The decrees exacted were expected to dry up a rather lucrative source of revenue for nazi agents (*U.S.* v. *Schering Corp. et al.*, Dec. 17).

An essential aspect of trade regulation in connection with the war effort was the problem of defense needs and the antitrust laws. The attorney general outlined a policy to guide the department of justice in an effort to resolve the conflict between the antitrust laws' prohibition against restriction of competition, on the one hand, and the administration's encouragement of concerted activity in the interests of national defense, on the other hand. The policy of the department was that any acts on the part of any unit of industry done in compliance with specific requests from the office of production management or the office of price administration and civilian supply, and approved by their general counsel, would not be the subject of any prosecution under the federal antitrust laws. But, to be free from the risk of proceedings under these laws, an industry committee must not undertake to determine policies for the industry nor attempt to compel anyone to comply with a request or order of OPM or OPA.

Formation of industrial committees at the request of the defense agencies is not to be considered unlawful, nor is co-operation of units of the industry in the selection of representatives or in the activities of the committees. But the committees must confine themselves to collecting and analyzing information and making recommendations. A caution was appended to the attorney general's statement to the effect that the department of justice reserves complete freedom to institute civil actions to enjoin the continuation of acts and practices found not to be in the public interest and persisted in after notice to desist.

On the domestic front three major controversial issues were the subject of acrimonious hearings before the Federal Communications commission (*q.v.*) and of litigation which was in 1941 pending: the network monopoly regulations, the newspaper-divorcement inquiry and the rule banning multiple ownership of stations where duplicating service is involved. In issuing its monopoly order the Federal Communications commission announced its opinion that the chain broadcasting regulations would tend to decentralize the tremendous power over what the public might hear which was lodged in the major network organizations, and would remove existing restraints upon competition without interfering unduly with the operations of the network organizations; also that its chain broadcasting regulations should be applicable to regional as well as national networks. Special circumstances and considerations may be applicable in the case of regional networks, and the commission will examine any further representations on their behalf with especial care.

To effectuate its ban against multiple ownership of broadcasting stations the Federal Communications commission inaugurated the practice of issuing conditional grants to stations which might be involved in the "problem of multiple ownership." (*See* also section on *Trade Regulation.*)

Freedom of Speech.—The supreme court upheld on Jan. 13 the constitutionality of the sweeping Espionage act of 1917 which makes it a crime to obtain or transmit any "information respecting the national defense . . . to be used to the injury of the United States or to the advantage of any foreign nation," friend or foe. Two men convicted in California of violating the act in 1938 by furnishing to the U.S.S.R. naval intelligence reports which they deemed "innocuous" contended that the statute was so broad that it might even proscribe the publication of crop reports by newspapers if a jury held that such information was connected with "national defense" (*Gorin* v. *U.S.*, 312 U.S. 19).

The court said, however, that the provisions of the act were "not simple prohibitions against obtaining or delivering to foreign powers information which a jury may consider relating to national defense." In that case, it added, the law might be invalid. "But we find no uncertainty in this statute," the decision continued, "which deprives a person of the ability to predetermine whether a contemplated action is criminal. . . . The obvious delimiting words in the statute are those requiring 'intent or reason to believe the information to be obtained is to be used to the injury of the United States or to the advantage of any foreign nation.' This requires those prosecuted to have acted in bad faith. . . ."

The impact of the war was felt by radio through tightened controls and more scrutinizing checks in addition to the voluntary undertaking of certain obligations and prohibitions. (*See* RADIO.)

Conscription.—See SELECTIVE SERVICE.

Civil Relief to Soldiers and Sailors.—Courts had several occasions to construe the civil relief provisions of the act of 1940. Compliance with the act, ruled a New Jersey orphans' court, requires the filing in probate proceedings of affidavits relative to military service of all interested parties before default judgment may be entered. Noting that none of the cases under the 1918 Relief act bears upon its applicability to proceedings in a probate court, the court applied a liberal construction of the 1940 act so as to bring a petitioning executor within the definition of a plaintiff and all parties interested in the proceeding as included within the meaning of the term "defendant" in the law. Similarly, a "judgment" is defined as including a decree in the probate court. When an attorney is appointed by the court to represent a party entitled to relief under the statute in cases in which allowances are commonly made, the court saw "no good reason why reasonable compensation should not be awarded." In other cases, the court concluded, the services of an attorney so appointed are to be regarded "as a patriotic duty for which no compensation would be expected."

Procedure for obtaining certificates concerning military service of persons involved in court proceedings under the Soldiers' and Sailors' Civil Relief act was announced by the war department in April. Requests for certificates must be accompanied by the fullest possible information relating to the identity of the person with respect to whom the certificate is desired. Where the request is made by a person other than the one whose military service is in question, it must be accompanied by an affidavit describing the pending court proceeding. (*See* also RELIEF.)

Commandeering.—By the act of Oct. 16 the president, from May 27, 1941, to June 30, 1943, determines the use of military or naval equipment, supplies or munitions or parts, or machinery, tools or materials needed for the manufacture, servicing or operation of such equipments needed for the defense of the United States; and that the need is immediate and will not admit of delay or resort to any other source of supply; and all other means of obtaining the use of such property upon fair and reasonable terms have been exhausted, he is authorized to requisition such property for the defense of the United States upon payment of fair compensation to be determined as provided by the act, and to dispose of such property as he may determine best for the defense of the United States. The act does not include authorization of requisitioning or requiring the registration of firearms possessed by an individual for his personal protection or sport, infringing on the right of individual to keep and bear arms, or authorization of requisition of machinery or equipment of any factory or business which is necessary to the operation of such factory or business. A report of operations under the act shall be made to congress from time to time, at least once every six months.

Aliens.—See IMMIGRATION AND EMIGRATION.

Patents.—Activity of the department of justice and a number of cases brought to the limelight the fact that in most industries profitable operation was in greater or less degree dependent upon the use of machines or processes which were the subject of patent rights, and in many, the product itself or a part of it might be patented.

Serious problems arose from the fact that every holder of a patent enjoys a legal monopoly for a limited period. Because of his right to withhold licence from others, the unrestricted opportunity for new firms to enter into the various industrial fields may be considerably curtailed. Furthermore, inroads upon the free competitive market are brought about when groups are able to entrench themselves in power through combinations of patents and systems of restrictive licensing which enable them to achieve far-reaching control over production prices and access to industry. For developments see *Trade Regulation* page 329.

Public Utilities.—A hydro electric power project to be operated in connection with two licensed projects located on government land and on a stream that provides most of the water for navigable rivers was held subject to the jurisdiction of the commission (*In re Pacific Gas & Electric Co.*).

The Federal Power commission also has authority to require a power company to apply for licence to operate and maintain a dam on a river found to be navigable although the dam was built in reliance on a ruling of the secretary of war, made in connection with another project, that the river was not navigable (*Pennsylvania Water & Power Co.* v. *Federal Power Commission*).

A holding company may acquire its preferred stock by purchases on exchange (*In re Electric Bond & Share Co.*). Accordingly, orders of the Federal Power commission disallowing a proposed increase of rates and charges for natural gas sold by corporations engaged in the business of purchasing, transporting and selling natural gas by contract to public utilities in different states, where it is sold to ultimate consumers for domestic, commercial and industrial use, are not invalid (*Mississippi River Fuel Corp.* v. *Federal Power Commission*, C.C.A. 8).

Provision of the 1935 Holding Company act granting circuit court of appeals exclusive jurisdiction to review a rate order of the Federal Power commission is controlling over a provision of the 1929 act granting district court jurisdiction on review. The Federal Power commission does not have jurisdiction under section 20 of act to regulate rates of a power company operating in interstate commerce in the absence of a finding that the states concerned are unable to agree through their properly constituted authorities on charges to be exacted (*Safe Harbor Water Power Corp.* v. *Federal Power Commission*).

Securities.—A gratuitous solicitation of offers to buy, although entirely without authority from the issuer of the securities, was held to be an underwriting and, therefore, subject to the Securities and Exchange commission. In *SEC* v. *Chinese Consolidated Benevolent Assn., Inc.* (120 F.

[2d] 738) the defendant benevolent association urged the public purchase of unregistered bonds of the Chinese government. Although the defendant acted gratuitously and without direct authority from the issuer, the Securities and Exchange commission claimed that the defendant was an underwriter within the statutory definition of "any person who . . . sells for an issuer." A sale is defined to include "solicitation of an offer to buy." The commission sought unsuccessfully an injunction against the association. On appeal the circuit court held that the defendant was an underwriter and, hence, the SEC was entitled to an injunction.

An option to purchase securities which were not registered with the SEC is not illegal and void as contrary to public policy. The Securities act of 1933 requires the registration of securities to be sold to the public, granting certain exemptions based on the type of securities and the size of the offering. The purpose of the legislation was the protection of innocent purchasers, and the act sets forth a standard of conduct in the issuance and sale of securities, and also minima for disclosures to the public. For failure to register with the SEC the act imposes sanctions and raises certain liabilities to purchasers of the securities. Section 5 makes it unlawful to make use of the mails or any means of interstate transportation or communication to effect the delivery or sale of an unregistered security or the transmittal of an inadequate prospectus. Section 12 authorizes recovery of the consideration paid where the securities are sold in violation of section 5 or, in effect, of section 11. A fine of not more than $5,000 or imprisonment of not more than five years is the penalty imposed by section 24 for wilful violation of any of the provisions of the act. Despite the use of the term "unlawful" in section 5 and the imposition of fine or imprisonment, the court stresses the purpose of the act—the protection of purchasers—and holds that the illegality which raises liabilities to purchasers and even merits criminal penalties is not a defense to an action by one who will not be injured by the enforcement of the contract, where such enforcement would not be damaging to the public. In *A. C. Frost & Co.* v. *Coeur d'Alene Mines Corp.* (61 Sup. Ct. 414) the petitioner was the assignee of an option for the purchase of all or any part of 1,300,000 unregistered treasury shares of the defendant mines corporation. After the petitioner had purchased 165,000 shares defendant repudiated the option and refused further delivery. In his suit for damages, the supreme court of Idaho, finding that "all the stock offered for sale amounted to public offerings" and that means of interstate communication and transportation were used, held that failure to register rendered the contract illegal and void as contrary to public policy. On appeal the U.S. supreme court, for the purposes of the decision, accepted the Idaho court's finding that the evidence was sufficient to show a public offering, but held that the contract, otherwise legal and fair on its face, was not unenforceable.

Social Security.—Held under the Social Security (*q.v.*) act were: (1) Directors of banks performing services on committees of banks are employees for social security purposes; (2) employees of beauty service company as well as employees of water company in connection with operation or maintenance of its ditches, canals, reservoirs or waterways used partly or wholly for supplying or storing water for both domestic or farming purposes; (3) cost plus contractor—individuals performing services for a company in construction of a federal defense project under a cost-plus-a-fixed-fee contract with the navy department are considered employees for social security tax and the contracting company is an independent contractor; (4) a clothing salesman working on commission basis in assigned territory is an employee within the meaning of the Pennsylvania Unemployment Compensation act (*Leinbach Co.* v. *Unemployment Compensation Board of Review*, 22 A. [2d] 57); (5) all plants of a manufacturing corporation being synchronized units of work production system, constitute a single "establishment" within the meaning of provision of the Michigan Unemployment Compensation act disqualifying the employee from receiving benefits when unemployment is due to labour activity in progress in the establishment in which he is employed (*Chrysler Corp.* v. *Smith*, 297 Mich. 438).

Held not under the Social Security act were: (1) Services performed by employees on farms owned by an employer in connection with processing, grading and baling of cigar-leaf wrapper tobacco for market constitute "agricultural labour" for purposes of social security; (2) attorney appointed for collection of delinquent taxes; (3) musicians were held not to be employees of restaurant owner and therefore not under Unemployment Compensation act (*Unemployment Compensation Commission of Wyoming* v. *Mathews*, 111 P. [2d] 111); (4) hospital organized as nonprofit membership corporation is exempt as employer from New York Unemployment Insurance law when no part of its net earnings inures to the benefit of any private shareholder or individual although the majority of the patients pay part or all hospitalization charges (*in re Doctors' Hospital Inc.*); (5) one who is unemployed due to a labour or trade dispute is not entitled to the benefit of unemployment insurance (*Bodinson Mfg. Co.* v. *Calif. Unemployment Comm'n.*, 109 P. [2d] 936 [Calif.]); (6) employee member of a union in a closed-shop logging company was held not entitled to unemployment benefits where stoppage was caused by a labour dispute under the Oregon Unemployment Compensation act (*Latham* v. *Unemployment Compensation Commission*).

Taxation.—*See* TAXATION.

Torts.—Inducing one to breach a contract is an actionable wrong even though the one so induced was under no duty to perform. In *Philadelphia Record Co.* v. *Leopold* (40 F. Supp. 346) plaintiff, a newspaper publisher, invited readers and the public to participate in a puzzle contest known as "rebus games," thereby expecting to increase the circulation of the newspaper. Defendants were engaged in the business of rendering advice and assistance, for a price, in the solution of such puzzles. Plaintiff, seeking a permanent injunction against defendants' activities, was upheld in his contentions that this activity on the part of the defendants tended to destroy the effectiveness of the contest, that it discouraged contestants who had not subscribed for defendants' services from continuing in competition, that it vitiated the integrity of the contest and induced breaches of plaintiff's rules which it cannot detect. The professional puzzle solvers' solicitation and sale of answers to puzzles printed in the newspaper of the plaintiff constituted an inducement to a breach of contract, notwithstanding the fact that the contestants were under no duty to perform.

Despite the fact that a theatre ticket is merely a revocable licence an owner does not have the right to eject a patron without cause. In *Cummings* v. *St. Louis Amusement Co.* (147 S.W. [2d] 190 [Mo. App.]) plaintiff was forcibly ejected from defendant's theatre by defendant's employees and brought this action for damages for assault and battery. Defendant offered testimony attempting to justify the ejection on the ground that plaintiff was creating a disturbance. It was held erroneous for the trial judge to instruct the jury that the question of plaintiff's conduct was immaterial and that a theatre owner could eject a patron at any time with or without cause.

Trade Regulation. *Justification for Regulation.*—Control of trade policies has long been the subject of acrimonious debate in congress and before the courts. For years it has been held that the legislatures could fix prices only if the commodity was "affected with a public interest." No end to difficulty was introduced in the attempt to ascertain when commodities were affected with a public interest. When regulation was earnestly needed and the commodity could hardly be said to be affected with a public interest, such regulation was justified on the ground that emergency required it. In the absence of an emergency, the commodity could not be regulated under police power unless so "affected with a public interest."

For this reason the supreme court of Nebraska held unconstitutional its statute which provided that no private employment agency should collect from an applicant as compensation for its services, more than the aggregate of a stated registration fee and 10% of the first month's wages. The U.S. supreme court, however, overruled the long-standing doctrine that to be regulated a business must be affected with a public interest. The court, in fact, says that an industry is subject to control when such regulation is for the public good, and the wisdom, need and appropriateness of such legislation should be left where the constitution intended these to be left, the states and congress (*Olson* v. *Nebraska*, 313 U.S. 236).

Jurisdiction of the FTC.—The Federal Trade commission became increasingly more powerful after the passage of the Wheeler-Lea amendment to the Federal Trade Commission act gave it control over unfair and deceptive practices as well as over unfair competitive methods. To justify the commission's interference, however, (1) the practices must occur in interstate commerce, (2) the proceedings must be in the public interest and (3) before the commission can issue its cease and desist orders its findings must be based upon substantial evidence as that phrase is understood by U.S. courts (not speculative or meagre testimony). The following cases illustrate these principles.

(1). The FTC has no power to control intrastate activities merely because these affect interstate commerce. In *Federal Trade Commission* v. *Bunte Bros., Inc.* (312 U.S. 349) the FTC found that the defendant was engaged in unfair methods of competition in the sale of candy which burdened interstate commerce by reducing the sales of candy manufacturers doing an interstate business. Although the defendant's business was carried on entirely within one state, the commission ordered it to cease and desist from its unfair practices. The supreme court held that the defendant's activities were not "in interstate commerce" and were, therefore, not subject to the Federal Trade commission's jurisdiction. The court emphasized the fact that the interpretation of the law sought by the government would give the federal agency sweeping control over "myriads of local businesses in matters heretofore traditionally left to local custom or local law." Such an inroad, it concluded, "ought to await a clearer mandate from congress."

Control may, however, be exercised if it is apparent that the activities in question bear such a close relationship to interstate commerce that their control is appropriate to its protection. This was the situation in *Ford Motor Company* v. *FTC* (120 F. [2d] 175). The court held that the use of advertising, which leads purchasers to believe they are paying 6% interest on instalment purchases of automobiles, when in fact they are paying approximately 11½% simple annual interest, is an unfair method of competition in violation of the Federal Trade Commission act. The fact that no damage has been shown is no defense since the purpose of the act is to afford a preventive remedy, not a compensatory one. Jurisdiction of the FTC has been held to extend to local agreements intended to affect intrastate and interstate prices. Neither the reasonableness of the prices thus established by concerted action nor the claim that such an agreement is necessary to preserve the business will justify such a combination in restraint of trade (*Standard Containers Manufacturers' Ass'n* v. *Federal Trade Commission*, 119 F. [2d] 262).

(2). What is a public interest was stated in the *Pep Boys—Manny, Moe & Jack* v. *Federal Trade Commission* (122 F. [2d] 158). In that case, a retailer of radio supplies, requested the circuit court of appeals to review and set aside an FTC order enjoining as an unfair and deceptive practice in commerce, the petitioner's use of the trademark "Remington," which was the registered trademark of well known noncompetitors (Rem'ngton-Rand, Remington Arms, etc.). The circuit court held that a substantial and specific public interest being involved, the purchasing public is entitled to protection against this type of deception.

(3). To support an FTC order, substantial evidence is necessary. In one of the few cases lost by the FTC (*Kidder Oil Co.* v. *FTC*, 117 F. [2d] 892) the circuit court of appeals in Chicago admonished the FTC that it may not bar a practice without substantial evidence of its illegality. In the significant case of *FTC* v. *Scientific Mfg. Co., Inc.*, the FTC sought to enjoin the sale and distribution of a publication containing special articles—not advertising—expressing the publisher's honest opinion that cooking in aluminum utensils was deleterious to health, the commission maintaining the statements were false and misleading. The publisher was neither engaged nor materially interested in the manufacture or sale of the products concerning which he expressed his opinion. The commission relied for its authority on the Wheeler-Lea amendment to the Federal Trade Commission act, which empowers it to curb false and misleading advertisements where material (that is, where likely to be relied upon by any purchaser) as well as all unfair and deceptive practices in interstate commerce. In setting aside this order the circuit court held that if the commission's interpretation of its powers were allowed, the Federal Trade commission would become the absolute censor of the truth of all printed matter moving in interstate commerce.

(*See* also BUSINESS REVIEW: *Legislation Affecting Business;* CHILD LABOUR: *United States;* INTERNATIONAL LAW.) (B. WE.)

Lawn Tennis: *see* TENNIS.

Lawrence, William (1850–1941), U.S. Episcopal bishop, was born May 30 in Boston, Mass. He was bishop of Massachusetts from 1893 until his retirement in 1926. He established the church pension fund, a plan to provide old-age pensions for retired Episcopal churchmen. The fund's assets were rated at more than $30,000,000 in 1933. Among his later works are: *The New American* (1929) and the *Life of Phillips Brooks* (1930). He died in Milton, Mass., Nov. 6. (See *Encyclopædia Britannica.*)

Lead. A rough estimate of world lead production in 1940 placed it at 1,773,000 metric tons, an increase of 3% over 1939. Distribution of the output is shown in the table.

World Production of Lead
(In thousands of metric tons)

	1929	1937	1938	1939	1940
Australia	177.3	234.4	235.7	252.4	275.0
Belgium	62.2	88.0	90.5	96.0	55.0
Canada	148.0	186.4	185.7	177.9	210.0
Germany	97.9	162.4	171.7	181.4	200.0
Burma	81.5	78.9	81.4	78.6	83.0
Mexico	248.8	231.2	242.7	215.7	196.3
Spain	133.3	30.0	36.0	27.0	40.0
U.S.S.R.	6.2	55.0	69.0	75.0	75.0
United States	624.2	426.3	344.4	381.4	389.2
World Total	1,756.8	1,719.6	1,704.2	1,722.7	1,773.0
Ex. U.S.	1,132.6	1,293.3	1,359.8	1,341.3	1,384.0

The mine production of lead in the United States in 1940 was 457,392 short tons, while refinery output was 433,065 tons, to which is to be added 83,563 tons from foreign ores, 16,551 tons from foreign base bullion, and 16,588 tons from scrap, making a total refinery output of 549,767 tons, an increase of 7% over 1939, most of which was due to the increased lead from imported ores. The recovery of secondary lead in 1940 amounted to 260,346 tons, about half of which was in antimonial lead, with the remainder divided about equally between metal and other alloys.

Imports of lead into the United States in 1940 included 111,300 tons in ores, 19,624 tons in bullion, and 151,568 tons of metal, a total of 282,492 tons, as compared with only 86,883 tons in 1939. These figures are for total or general imports; imports for consumption were considerably lower, at 130,812 tons in all forms.

Exports dropped sharply from 1939 to 49,079 tons in 1940, about equally divided between metal from domestic and foreign sources, and an additional 15,604 tons of exports has been accounted for in manufactures exported during the year.

Adding to the above figures for mine output, total imports and secondary recovery, 4,667 tons of increase in smelter and refinery stocks and deducting total exports and 132,661 tons increase in stocks in bonded warehouses, gives a total available supply of 808,585 tons. Actual consumption was estimated at 782,000 tons, leading to the inference that consumers' stocks had been increased during 1941 by the difference between these two items.

There was little data at hand with respect to 1941. Mine output in the United States during the first 10 months was 379,600 tons, indicating about 460,000 tons for the year, which is only a minor increase over 1940. Imports for consumption during the first three quarters of 1941 were 311,216 tons, as compared with 130,812 tons for the full year of 1940, but exports continued at about the 1940 rate. Imports from Mexico and South American countries were being increased.

Aside from the United States, 1941 data were received only from Mexico, where the production to the end of July was down to 98,450 metric tons, against 120,867 tons in the same period of 1940. (C. A. Ro.)

League of Nations. The political activities of the League of Nations were greatly curtailed in 1941. But a nucleus remained at Geneva, still the League headquarters, and at Princeton, N.J., and in Washington, D.C., to carry out League obligations under various conventions, and to continue important technical work and collect material for postwar reconstruction.

The economic and financial section at Princeton, generously aided by a $50,000 grant from the Rockefeller foundation, continued its inquiries into the principles of income tax practice and legislation, to the advantage of governments building up or revising their tax systems. Key publications of the Economic Intelligence service appeared, the chief being a world economic survey. New studies were started, *e.g.* the lessons to be learned from successes and failures of financial and economic policies during the interwar period, with special attention to economic depressions. A volume was published on the part played by Europe in the trade of the world, from the angle of the production of vital raw materials and foodstuffs.

As a result of World War II, questions of health and nutrition and the campaign against drugs became of grave concern. League assistance was forthcoming. The epidemiological services, both at Geneva and Singapore, were maintained, greater use being made of wireless. Both neutral and belligerent countries kept in closest touch. The invaluable supply of serum standards throughout the world was continued, partly from the Copenhagen Serological institute, although in German occupation, and chiefly by the London institute. The health organization at Geneva received requests from governments, regarding contagious diseases and every aspect of public health. It possessed a wealth of experience and material in regard to questions of nutrition, curtailed only by lack of staff and finance, which were at the disposal of all health administrations.

The social section carried on work upon child welfare and protection of the family. Early in 1941 the successful collaboration with China was wound up, large quantities of medical supplies and transport being handed over to the Chinese. The task of settling the Assyrian Christians, from Iraq, on the Khabur in Syria was also brought to an end, the final report showed that the health and material welfare of the settlers were highly satisfactory. In London, the commissioner for refugees reported on the work achieved, from the human standpoint, and for legal protection and emigration. Considerable assistance was given to private organizations for refugees.

Nearly all governments sent in their annual drug reports. An important branch of the Permanent Central board was opened at Washington. The secretariat kept all governments posted in the latest information on the illicit traffic, texts of new laws, etc. The drug situation in Europe and the far east was kept constantly in review.

Notices of withdrawal, and the occupation of certain countries, adversely affected contributions to the League's budget at first. But during 1941 the situation steadily improved. The 1941 budget was cut down to about £500,000. Owing to early and full payment of contributions by a majority of member states, the financial situation, later in the year, was sound.

As a result of the occupation of Holland by the Germans, the Permanent Court of International Justice at the Hague was unable to function. The president and registrar of the court took up their residence in Switzerland.

(*See* also DRUGS AND DRUG TRAFFIC; MANDATES; REFUGEES.)
(M. FE.)

Leahy, William Daniel (1875–), U.S. naval officer, was born at Hampton, Ia., on May 6. He was graduated from the U.S. naval academy in 1897, was commissioned ensign in the same year and became captain in 1918. In 1912 he was chief of staff of the Nicaraguan occupation armies and in 1916 chief of staff in the Haitian campaign. In 1927 he was made chief of the naval bureau of ordnance, and was commissioned rear admiral in 1930. He became commander of the destroyers' scouting force in 1931 and chief of the bureau of navigation in 1933. Leahy thus became the first officer in U.S. naval history to be chief of the two important bureaus of ordnance and navigation, as well as chief of naval operations, an appointment he received in 1937. He was commissioned vice-admiral in 1935 and admiral in 1936.

Upon his retirement from the navy in 1939, he was appointed governor of Puerto Rico. In Nov. 1940, President Roosevelt

named him ambassador to the French government at Vichy. In this post, throughout 1941, Leahy had the difficult and at least partially successful task of persuading Pétain's government, by various degrees of economic and diplomatic pressure, not to become totally immersed in Hitler's "new order."

"Lease-Lend" Act (H.R. 1776): *see* DEFENSE, NATIONAL (U.S.); GREAT BRITAIN: *History;* INTERNATIONAL LAW; LEND-LEASE ADMINISTRATION, OFFICE OF; NEUTRALITY.

Leather. The leather industry was greatly affected by wartime conditions throughout 1941, but significant accomplishments were achieved. Production was increased in the United States about 35% over 1940 without sacrifice of normal quality standards and without sharp price increases. It is estimated that United States tanneries as a whole operated at between 90% and 95% of theoretical capacity limits throughout the year to meet the demands for huge quantities of many types of leather for military uses and to satisfy a greatly increased demand from civilian customers.

The steady increase in demand for leather was accompanied by difficulties in obtaining prime raw materials. This resulted in new research by the industry to increase productive efficiency; to conserve existing materials; and to develop new materials for tanning or new methods of using materials not commonly used before the emergency.

Statistics of the industry outside the United States were lacking for 1941 because of the war. Those pertaining to operations in the United States were somewhat incomplete, and because of changed conditions not strictly comparable with previous years.

Raw hide and skin production of the United States remained in 1941 on a level with other years, but imports were substantially increased to meet the greater demand for leather.

United States imports of cattle hides in 1941 were at the estimated rate of better than 7,000,000 hides a year, compared with average imports in the period of 1935–39 of slightly more than 3,000,000 yearly. Calfskin imports reached an estimated 3,000,000 skins in 1941 which was slightly below the 1935–39 average of 3,200,000 skins annually. The 1941 rate of sheep and lambskin importations was estimated at 45,000,000 skins yearly, which is more than double the 1935–39 average of slightly more than 21,000,000 skins annually. The 1935–39 average annual importation of goat and kidskins was slightly more than 43,000,000 skins. Estimated importations in 1941 amounted to more than 45,000,000 skins.

Research.—Continuous research was conducted by the industry to discover means of conserving available supplies of raw stock and tanning materials. This resulted in increased efficiency in the operations of some tanneries and a general trend to eliminate wasteful procedures wherever they were uncovered.

Most important research of 1941 was conducted in the field of tanning materials. Tanning material supplies were directly affected by three factors: Wartime shipping difficulties which cut off sources of supply of numerous important materials; the increased demand by war industries for certain materials necessary to 1941 methods of leather manufacture; and the need for more tanning materials by the leather industry itself, because of increased production.

Chromium salts are extensively used in making shoe upper leather, some sole leather and various specialty leathers. Because of the excessive use of chromium in war industries the tanning industry was confronted in 1941 with an impending shortage of serious proportions in chrome ore for making chrome tanning liquors. This threat revived intensive study of other forms of mineral tanning, particularly of processes of tanning leather with iron salts. At the end of the year, it was announced that investigation of steel mill waste liquors had clearly indicated the possibility that a valuable supply of materials suitable for chrome-iron tanning might be found in this waste matter. About 500,000,000 gal. of the waste are available annually and the content of such liquors is essentially 3% to 4% of 100% sulphuric acid, and from 15% to 18% of ferrous sulphate. Leather tanned experimentally with these waste liquors proved satisfactory in numerous early tests.

There were also some shortages of chemicals used in disinfecting hides and skins and in preparing raw stock for tanning. These shortages were largely overcome by adoption of other materials for the purpose after continuous study of available materials.

Vegetable tanning processes used for making sole leather were revised during 1941 because of shortages of materials such as gambier, sumach, valonia and myrobalan. About 65% of all vegetable tanning materials used by United States tanners must be imported, but many of these are obtained from sources which are still open, provided ships and cargo space are available. The industry found reasonable substitutes for all of the unavailable vegetable tanning materials except valonia, which is not considered too essential, and which is not normally used by many tanners.

There was greater interest in and considerable study of new sources of tanning materials, and as many of the common forms of plant life are rich in tannin content, it was believed that further experiments would result in greater use of tanning materials to produce leather of satisfactory quality.

The industry did not experience a general shortage of oils and greases used in leather manufacture, but some items were not available, or were available only in restricted quantities. Substitutes were employed for materials which could not be obtained in required quantities.

In the United States severe shortages were encountered in the field of aniline dyes because defense agencies took control of practically the entire supply of aniline oil, toluene, acetic acid anhydride and formaldehyde. These same materials are also used by the leather industry in synthetic tanning materials and in disinfectants. In most instances, reasonably satisfactory substitutes were found for available materials, but the industry experienced increasing difficulties by the end of the year in connection with dyestuffs and finishing materials.

Government Regulations.—Government regulations in the United States had some effect on the leather industry in 1941. In December the Office of Production Management (*q.v.*) suspended trading in all wet-salted, dry and dry-salted foreign cattle hides, calfskins and kipskins. The suspension was lifted two weeks later under restrictions which required that imports must be made by government agencies and supplies afloat sold to those agencies.

The Office of Price Administration (*q.v.*) established price ceilings on domestic hides and skins in an order issued in June and later amended several times. Ceiling prices established by the order followed closely the existing market price of the hides and skins in general.

In December the OPA established price ceilings on leather, using the average market prices prevailing in the period of Nov. 6 to Dec. 6 as a basis for the new price limits.

Price ceilings on some 1,800 fats and oils were set by the OPA on a basis of market prices prevailing Nov. 26. (Later amendments to the price order raised the ceiling on some items.) Included in the price-controlled fats and oils were a number used extensively by the tanning industry.

At the end of 1941 several moves of major importance were made voluntarily by the industry to conserve supplies of raw stock, tanning materials and finished leather that might be needed for war purposes or for supplying Allied nations. These included, among many things, a voluntary "freezing" of supplies of certain sole leathers suitable for army shoes, and in some instances restricted deliveries of certain upper leathers needed for the same purpose and also of a few special types of leathers.

Previously the government had taken control of all supplies of sheep shearling leathers and had diverted those leathers to the sole use of the military forces, for making aviators' jackets, and other items of clothing and special footwear.

Foreign Trade.—Foreign trade of the U.S. industry was greatly affected by the war. Imports of hides and skins increased, while exports were low. Imports of major tanning materials which were available also increased through the year, as did imports of finished leather from South American sources. Leather exports were also higher and were estimated to be about 35% above 1940 levels.

World production of leather was believed to have been increased from 10% to 25% during 1941, but tanners in many countries were confronted with more serious problems of obtaining stocks and materials other than those in the United States. It was believed the quality of leather produced in several leading countries declined appreciably below usual standards, and also below the standards upheld in the United States and Great Britain. (*See* also SHOE INDUSTRY.) (R. B. B.)

Lebanon: *see* SYRIA AND LEBANON.

Lebesgue, Henri (1875–1941), French mathematician, was born in Beauvais, France. He became professor in the Collège de France in 1921 and a member of the French Academy of Sciences in 1922. Lebesgue devised a method in mathematics for finding a measure of an arbitrary set of points and his name was given to this method. Lebesgue's death was reported from Vichy, France, Aug. 6.

Leblanc, Georgette (1875–1941), French actress, who starred in many of Maurice Maeterlinck's plays, was the daughter of a wealthy Rouen ship-owner. She was well launched on a career as a singer and actress when she met Maeterlinck at a supper party. A companionship of 20 years followed, during which time she played principal roles in his dramas, and helped him with his writing.

This period she described in her book, *Souvenirs, My Life with Maeterlinck*. She first toured the United States in 1912, in Maeterlinck's *Pelléas et Melisande*. Her death in Cannes was announced in a Vichy dispatch, Oct. 28.

Leblanc, Maurice

(1864–1941), French writer, was born Dec. 11 in Rouen, France. He studied in England and Germany, worked in his father's shipyards in Rouen and then left for Paris to become a writer. His first novel, *A Woman* (1887) met with little success. But young Leblanc, at the behest of a newspaper editor, wrote a crime story called *The Arrest of Arsène Lupin* (1906). The hero, an impudent gentleman burglar who evaded all police snares, caught the popular fancy and the young French writer was launched on a successful career as an author of crime stories. The Arsène Lupin stories made Leblanc internationally famous and the books were widely translated. Among his best-known works are: *Arsène Lupin, Gentleman-Cambrioleur* (1907), *Arsène Lupin Contre Sherlock Holmes* (1908), *Les Trois Crimes d'Arsène Lupin, Le Triangle d'Or, L'Ile aux Trente Cercueils* and *Les Trois Yeux.* M. Leblanc died in Perpignan, Nov. 6, less than two weeks after the death of his sister, Georgette Leblanc (*q.v.*).

Leeb, Wilhelm Joseph Franz Ritter von

(1876–), German general and field marshal, was born Sept. 5 in Landsberg-am-Lech, Bavaria. He joined the army at the age of 19, later serving in the German expeditionary force to China during the Boxer rebellion. Upon his return to the Reich, he entered the war academy, and served on the German general staff during World War I. Following the war, he was engaged in quelling communist uprisings in Bavaria, after which he rose to the rank of general. In 1935 he was made one of the three army group commanders of Germany, being assigned to group no. 2, based at Cassel. During Hitler's purge of army officers in 1938, von Leeb resigned his post, but was later recalled to take command of an army of occupation in Czechoslovakia. In 1940 he commanded the German troops on the Rhine, storming through the Maginot line after the collapse of the French armies in the north. When German armies invaded the U.S.S.R. in 1941, he was assigned command of the German armies assaulting Leningrad. Marshal von Leeb's armies pushed back the Russian forces virtually to the gates of Leningrad in the fall of 1941. But in December, the Russians counterattacked, threatening his armies with encirclement. After he lost the initiative on the Leningrad front, von Leeb was reported to have offered his resignation to Hitler.

Leech, Margaret Kernochan

(1893–), U.S. author and wife of the late Ralph Pulitzer, publisher, was born Nov. 7 in Newburgh, N.Y. A Vassar graduate, Miss Leech turned to writing as a career and was the author of *The Back of the Book* (1924), *Tin Wedding* (1926), *Anthony Comstock,* written in collaboration with Heywood Broun (1927) and the *Feathered Nest* (1928). Her *Reveille in Washington,* published in Aug. 1941, was a graphic and realistic picture of life in Washington, D.C. during the American Civil War. Miss Leech spent five years searching through old Washington newspapers, journals and letters to collect material and anecdotes for the book, which became an immediate best-seller.

Leeward Islands: *see* WEST INDIES, BRITISH.

Legislation: *see* LAW.

Leland Stanford Junior University: *see* STANFORD UNIVERSITY.

Lemons and Limes.

The indicated U.S. production of lemons Dec. 1, 1941, was estimated by the department of agriculture as 14,580,000 boxes, 70 lb. net to the box. California is the only state in the United States that produces lemons. The 1940 crop was 17,099,000 boxes, that of 1939 was 11,938,000 boxes, and the ten-year (1930–39) average was 8,815,000 boxes.

The U.S. lime crop is produced in Florida. The crop was estimated Dec. 1, 1941, by the department of agriculture as 120,000 boxes compared to 80,000 boxes in 1940, and 95,000 boxes in 1939, and a ten-year average of 37,000 boxes. Owing to the war, very little data on production of lemons and limes in other countries was available in 1941. For the season of Jan.–Aug. 1941, Cuba reduced its export of limes to the United States to 419,000 lb. (705,000 lb. in 1940). Mexico was reported to have increased its production of limes 65% since 1935. Mexican lime production in 1940 was 945,000 bu. (S. O. R.)

"Lend-Lease" Act: *see* DEFENSE, NATIONAL (U.S.); GREAT BRITAIN: *History;* INTERNATIONAL LAW; LEND-LEASE ADMINISTRATION, OFFICE OF; NEUTRALITY.

Lend-Lease Administration, Office of.

The lend-lease act was enacted by the U.S. congress March 11, 1941, after it had been recognized that the countries resisting aggression were fighting potential enemies of the U.S.A. Thus the lend-lease act established the principle that the United States should be the arsenal of the democracies. From the passage of the bill until May 2, 1941, operations were carried on by the staff of the president's liaison committee, headed by Major Gen. James H. Burns. This committee had been created by the president Dec. 6, 1939 to co-ordinate foreign and domestic military purchases. It was formally dissolved April 15, 1941.

On May 2, 1941 President Roosevelt issued an executive order establishing the division of defense aid reports within the Office for Emergency Management of the executive office of the president. Major Gen. James H. Burns was designated executive officer of the division, assisted by the former staff of the president's liaison committee. The division of defense aid reports was set up to provide a single channel for the clearance of actions and reports under the lend-lease act, for the co-ordination of the processing of requests for aid under the act, and for maintenance of a system of reports and accounts approved by the bureau of the budget. It was also instructed to serve as a clearing house of information for agencies participating in the lend-lease program, and as a central point to which all representatives of foreign governments requesting lend-lease aid should bring applications.

In due course, the need for broadening of the central administrative office's function and responsibilities became apparent, and, by executive order issued Oct. 28, 1941, the division of defense aid reports was dissolved, and the Office of Lend-Lease Administration was created, with E. R. Stettinius, Jr. (*q.v.*) as its head. The lend-lease administrator was formally charged with responsibility for making allocations, transfers and retransfers, and for exercising any power or authority conferred upon the president under the lend-lease act.

He was made primarily responsible for co-ordinating and expediting the procurement and delivery of lend-lease goods and services.

Actual purchasing operations under the act are not a function of the central administrative office, but are carried on by the various government agencies best qualified to do each specific job. The Office of Lend-Lease Administration works very closely with each of the procurement agencies—war, navy, maritime commission, treasury (procurement division), and the department of agriculture—in determining whether items formally requested by foreign governments are lend-leasable. If a requisition for an item is approved as part of a previously agreed-upon program, an allocation of funds is made, and the procurement is then undertaken by the department concerned in accordance with its normal procurement procedure. The necessary priorities and transportation problems are worked out with the assistance of specialists in these various fields. The transfer and export of any lend-lease material is normally authorized by the lend-lease administrator at the same time as its procurement.

The lend-lease act provides that the president shall report to congress every 90 days on operations under the act. In 1941 three such reports were published.

To the end of 1941, two appropriations had been made by congress specifically for lend-lease purposes, the first on March 27, 1941, in the amount of $7,000,000,000, and the second on Oct. 28, 1941, in the amount of $5,985,000,000—a total of $12,985,000,000. As of Nov. 30, out of these appropriations, 61% or $9,186,000,000 had been allocated to the procuring agencies for specific projects. As of the same date, these agencies had obligated 57% of their allocated amounts, or a total of $5,243,000,000. Total aid rendered under the lend-lease act during the same period amounted to approximately $1,202,000,000. This figure included $723,000,000 of defense articles transferred to foreign governments, $140,000,000 of defense articles awaiting such transfer or use by foreign governments, $92,000,000 of articles in process, $79,000,000 for testing and reconditioning of merchant and naval vessels, $75,000,000 for expansion of lend-lease production facilities, and $92,000,000 for transportation of defense articles to combat areas.

Countries in the lend-lease area at the end of 1941 included:

Argentina	Egypt	Nicaragua
Bolivia	El Salvador	Norway
Brazil	Free Belgium	Panama
British Empire	Free France	Paraguay
Chile	Greece	Peru
China	Guatemala	Poland
Colombia	Haiti	Russia
Costa Rica	Honduras	Turkey
Cuba	Iceland	Uruguay
Dominican Republic	Mexico	Venezuela
Ecuador	The Netherlands	Yugoslavia

The Office of Lend-Lease Administration in 1941 also had the responsibility of using lend-lease machinery in the handling of requisitions of foreign countries for the purchase of specific items on a "cash reimbursement" basis. This procedure provided for the procurement of an item in precisely the same way as that used for other lend-lease operations, with the exception that the foreign government deposited cash with the United States treasury against the value of the goods to be purchased, before delivery. As of Nov. 30, 1941, various foreign governments had made such deposits in a total amount of $8,420,124.

As a third function, the lend-lease office assists foreign governments in the lend-lease area in making direct cash contracts with U.S. suppliers for the purchase of defense articles, and in expediting deliveries.

Funds provided under lend-lease in 1941 permitted China to make improvements on the Burma road to increase the traffic capacity of that artery appreciably, while a roughly parallel railway was also being extended for the transportation of lend-lease goods. Many hundred British merchant and naval ships were repaired, refitted and supplied with stores from U.S. shipyards in 1941. U.S. armament in the form of aircraft, tanks and guns was shipped in large quantities to the middle east in 1941, while shiploads of food went to the British Isles for maintenance of civilian health and morale. Special lend-lease representatives in Great Britain, U.S.S.R., China, Iceland, Iran, North Africa and Egypt were maintaining close supervision of the disposal and use of lend-lease material in 1941. (*See* also AGRICULTURE; DEFENSE, NATIONAL [U.S.].) (E. R. Ss.)

Leonard, Eddie (LEMUEL GORDON TONEY) (1875–1941), U.S. stage and vaudeville star, was born in October in Richmond, Va. After a brief career in professional baseball, Toney, who had a natural flair for entertainment, joined a minstrel troupe and changed his name to Eddie Leonard. By the 1920s he had made fame and fortune on the stage and the whole country was singing his famous compositions, "Ida, Sweet as Apple Cider," and "Roly Boly Eyes." After the advent of the talking movies, blackface comedy became a dying art, and Eddie Leonard retired. In 1929 his savings were wiped out by the depression, and Leonard ventured into night-club singing and restaurant management. He died in New York city, July 29.

Leprosy. Although leprosy is prevalent among the people living on the island of Cebu, for some reason one town of about 6,500 people has the low rate of 0.45 per 1,000, while two towns of similar size have rates of 19.7 and 17.6 per 1,000. The people living in the first town had fewer communal customs than the inhabitants of the other two.

Children living with a leprous parent are likely to contract the disease (25% to 75%). In Brazil where there are approximately 35,000 lepers, preventoria are being constructed to care for 3,250 children so that they may be separated from their leprous relatives.

A study of 249 lepromatous (nodular) cases whom the authors had been able to follow from the time of the appearance of very early lesions resulted in the observations that 65% to 68% first exhibited some type of neural involvement. In about one-half of these the first evidence of disease was the enlargement of nerve trunks and in one-third the first change noticed in the skin was the loss of sensibility even though there may have been no visible evidence of a skin lesion. The average duration of the nerve phase was 3.4 years.

The tendency for spontaneous arrest or improvement in leprosy makes the evaluation of treatment difficult. A study of untreated leprosy was made in Nigeria. A village of 1,800 people was surveyed in 1937. Leprosy was seen in 118 people and detailed clinical notes made. Although no treatment was given, on re-examination three years later, 23% were improved and 33% were unchanged.

Further reports were made on the use of diphtheria toxoid by the author who first described the method in 1940. In experience gained in treating 193 asylum cases beneficial results were reported in the early and moderately advanced neural and in early lepromatous cases. Another member of the same group writing at a later date was less sanguine about this method of treatment but believed that it might prove useful. As opposed to the results reported by the originator of the diphtheria toxoid treatment, a leprologist on another continent tried the method on 19 cases for several months and found no benefits derived. The treatment caused much discomfort and was unpopular with the patients. Other types of treatment reported by other investigators were naphthalan oil baths and sunlight, an "antileprosy serum" and a vaccine made of certain fractions of the tubercle bacillus. Results were inconclusive. Twelve patients treated by surgical removal of solitary lesions were followed from 1½ to 7 years and 11 remained well.

In 1939 it was reported that by the use of an antigen made of a culture of *Treponema pallidum* (spirochete causing syphilis) in performing Wassermann tests on blood of leprous patients false positive results were greatly reduced. Several have attempted to repeat this work and results in general were confirmatory. One group examined 37 sera from leprous individuals which were positive with ordinary antigens and found that only six reacted positively when the spirochetal antigen was used.

Studies of the pathology of human leprosy continued. A report of probably the youngest person with leprosy to be autopsied was made of a child aged 17 months who died of pneumonia. Another pathologist made a detailed study of the blood vessels in leprous lesions. The study covered ten autopsies and 67 biopsies. In 32 cases some involvement of the blood vessels was found, usually with bacilli seen in the endothelial (lining) cells. Phosphatase determinations were made on sera from 102 leprous people simultaneously with nonleprous individuals in the same environment. No abnormality was noted. Of 70 lepers examined relatively low ascorbic acid (vitamin C) levels were discovered in 46.

Workers still hopeful of success continued attempts to grow the leprosy bacillus (*Mycobacterium leprae*) on artificial culture media but no enthusiastic claims of success were recorded during 1941. One investigator since 1932 attempted to culture 89 leprous nodules and 35 blood specimens from patients with leprous fever on more than 100 different types of media. Another bacteriologist made similar attempts using 50 different types of media and making 1,718 inoculations watching some tubes for three years. A third investigator used 109 different media combinations, many of which were suitable for culturing human cells, but no multiplication of bacilli was seen.

Failure to reproduce human leprosy in an animal which could be used for experimental purposes has always been a challenge to workers in leprosy. One group reported continuing previously recorded attempts to infect fowls. After seven transfers from fowl to fowl they believed that human leprosy bacilli were actually multiplying in the breast muscles. In Brazil an attempt was made to produce the disease in a species of hamster not previously used (*Cricetus cricetus*). Results were inconclusive. In Indo-China a monkey was injected 18 times with material from a case of human leprosy. Slowly resolving lesions occurred in the inoculated skin, but no evidence of generalized leprosy was seen.

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Lettuce. The U.S. lettuce crop in 1941 was 23,388,000 crates[1] from 158,770 ac. and was valued at $39,136,000 for the crop year. The 1940 crop was 22,754,000 crates from 145,870 ac. and was valued at $22,754,000; the ten-year (1930–39) average, 19,941,000 crates from 159,980 ac., valued at $28,414,000. The 1941 yield was 147 crates per acre, compared with 156 in 1940 and a ten-year average of 125 crates per acre.

[1]Western crates containing 48 to 72 heads and weighing approximately 70 lb.

U.S. Production and Sales Value of Lettuce by Leading States, 1941 and 1940

	1941 crates	1940 crates	1941 sales value	1940 sales value
Early crop				
California	3,176,000	2,736,000	$4,446,000	$3,830,000
Arizona	1,905,000	2,280,000*	2,572,000	1,794,000
Florida	460,000	711,000	698,000	813,000
Second early				
California	3,174,000	3,581,000	6,983,000	6,338,000
Arizona	3,074,000	2,385,000	5,072,000	4,818,000
South Carolina	126,000	90,000	315,000	180,000
Intermediate				
Washington	434,000	412,000	490,000	515,000
New Jersey	330,000	375,000*	487,000	488,000
Idaho	96,000	40,000	158,000	80,000
Late (1)				
California	3,960,000	3,628,000	7,920,000	5,007,000
New York	732,000	832,000	856,000	790,000
Colorado	472,000	500,000	566,000	525,000
Late (2)				
California	4,422,000	3,906,000	7,296,000	5,625,000
Idaho	240,000	331,000	108,000	132,000
New Jersey	135,000	175,000	135,000	140,000
Oregon	133,000	207,000	113,000	145,000
Washington	120,000	119,000	156,000	107,000

*Includes some quantities not marketed and excluded in computing sales value.

(S.O.R.)

Levinson, Salmon Oliver (1865–1941), U.S. attorney, was born Dec. 29 in Noblesville, Ind., the son of a poor Jewish emigrant from Germany. He attended the University of Chicago for three years and was graduated from Yale in 1888. Three years later he was admitted to the bar. During the early part of World War I he called upon pro-Ally and pro-German leaders to demand peace and seek for a negotiated settlement. After the war he advocated the entry of the United States into the League of Nations, but he later denounced the league when it failed to outlaw war. In 1921 he worked with the U.S. delegation to the disarmament conference. In 1927 he helped in the drafting of what was later the Kellogg-Briand pact. He also tried to organize world opinion against the Versailles treaty and offered his own plan for readjustment of German reparations, Allied and international debts and world peace. In 1929 he established the $55,000 William Edgar Borah Outlawry of War foundation at the University of Idaho. He died in Chicago, Feb. 2.

Levitzki, Mischa (1898–1941), U.S. concert pianist and composer, was born May 25 in Kremenchug, Russia of naturalized U.S. parents. A child prodigy of remarkable talent, the young Mischa mastered the violin at the age of three and the piano at six. Astonished by his ability, his parents sent him to Warsaw, where he studied piano under Michalowski. In 1907 they returned to the United States and Mischa became the pupil of Sigismund Stojowski. The lad then went to Berlin to study under Ernst von Dohnányi and subsequently they appeared in joint concerts in Berlin, Vienna and Budapest. Levitzki made his first New York appearance in 1916 and established his reputation as an artist. His compositions include "Arabesque Valsante," "The Enchanted Nymph," "Gavotte," "Valse Opus 2," "Valse de Concert" and "Cadenza to Beethoven's Third Concerto in C Minor." He died Jan. 2 at his home in Avon-by-the-Sea, N.J.

Lewis, Dean De Witt (1874–1941), U.S. surgeon, was born Aug. 11, at Kewanee, Ill. He was graduated from Lake Forest university in 1895 and received his medical degree from Rush Medical college in 1899. He became an instructor in anatomy at Rush college in 1900 and professor of surgery there in 1920. From 1925 to 1939 Dr. Lewis was professor of surgery at Johns Hopkins medical school and surgeon-in-chief at Johns Hopkins hospital. He worked extensively in nerve, brain and abdominal surgery and was credited with devising the "cable transplant," a method of joining the severed ends of a nerve. Dr. Lewis, who resigned his posts at the Johns Hopkins medical school and hospital in 1939, died in Baltimore, Oct. 9.

Lewis, Mary Sybil (1900–1941), U.S. opera singer, was born Jan. 7 in Hot Springs, Ark. After a varied singing career that included solo work in church choirs and musical shows, including the "Ziegfeld Follies," she made her operatic debut at the Metropolitan in New York city in Jan. 1926, as Mimi in *La Bohème*. Music critics were lavish in their praise of her histrionic ability and her ability to "put a song over," although they were lukewarm in praising her voice. She temporarily forsook opera after her marriage to Michael Bohnen, Metropolitan basso, in 1927. Subsequently she returned to the concert stage and sang on the radio and in motion pictures. She died of a heart attack after a prolonged illness in New York city, Dec. 31.

Libel: *see* LAW.

Liberia, an independent Negro republic on the west coast of Africa, bounded N.W. by Sierra Leone and in the hinterland and E. by French West Africa. Area, *c.* 46,000 sq.mi.; pop. (est. Dec. 31, 1938), 2,500,000. Chief town: Monrovia (cap., 9,700). President in 1941: Edwin Barclay; language, official: English; religion: Christian (Protestant).

Although increasing attention continued to be paid to health and education in 1941, complete absence of railways and inefficiency of roads acted as a brake on progress. A main arterial road was in course of construction. After 1938, selected students from the high school were sent to the Achimota agricultural college for training. The chief products were rubber and palm kernels; large deposits of iron and other ores are known to exist, but they had not been worked in 1941.

Education.—(1938): schools 161; scholars *c.* 10,000.

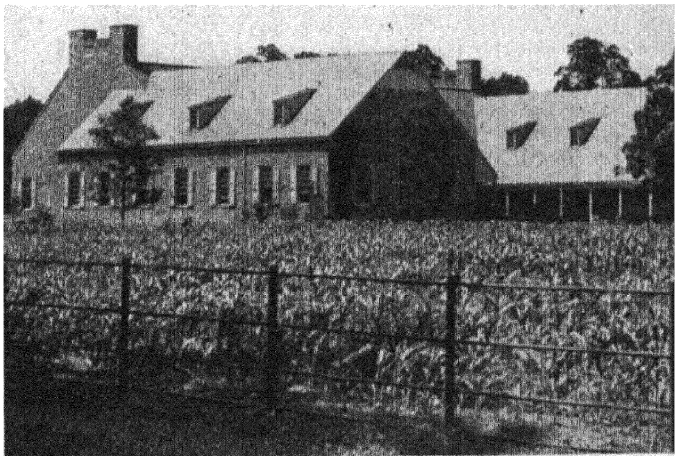
Banking and Finance.—In 1940: revenue and expenditure, est. $675,200; public debt (Jan. 1, 1939), external $U.S.1,602,000; internal $Lib.241,864. Currency: Liberian dollar, exchangeable at a fixed rate of $4.80 = £1 sterling in 1941.

Trade and Communication.—Overseas trade, 1939: imports, $2,002,864; exports $2,714,133. Communications, 1939: roads suitable for motor traffic, *c.* 180 mi.; shipping entered, 1939, 1,390,535 tons.

Agriculture and Mineral Production.—In 1938 (export figures in metric tons): rubber, latex, 1,457; rubber, crepe, 1,456; piassava, 5,008; coffee, 892; cocoa, 549; palm kernels (1939) 5,300; gold 59 kg.; ivory, 9,147 lb.; palm oil, 162,757 imperial gallons.

Liberty Ships: *see* SHIPBUILDING.

Libraries. Inevitably the part that books could play in preparation for defense and, after Dec. 7, in the prosecution of the war, occupied the attention of librarians in



THE FRANKLIN D. ROOSEVELT LIBRARY at Hyde Park, N.Y. was dedicated by the president June 30, 1941

the United States. A survey of the resources of research libraries in the fields of science, technology and economics, the provision by public libraries of technical books to meet the needs of workers in defense industries, the formation of information centres for civilian defense, co-operation with the libraries being organized in camps and elsewhere for the army and navy and maintained at government expense were some of the special activities in which libraries were engaged in 1941. Plans were under way late in the year for a "Victory Book Campaign," under the direction of Althea H. Warren, librarian of the Los Angeles Public library, to collect 10,000,000 good books for the armed forces to supplement the existing book collections provided by the army and navy. The campaign was sponsored by the American Library association (*q.v.*), the American Red Cross (*q.v.*) and the United Service organizations (*q.v.*).

Certain British libraries suffered heavily in air raids, but there was almost no information as to the extent to which European libraries were damaged or destroyed or looted by the Germans. The Rockefeller foundation made a grant of $20,000 for the purchase of microfilm copies of current periodicals that might be needed by institutions in Europe and Asia. It seemed important that irreplaceable materials for research be protected in case of air raids on the U.S. Some libraries moved their more valuable books and manuscripts to places of comparative safety. Plans were being made by many libraries in areas that might be bombed.

In May representatives of large university and reference libraries met in New York to discuss problems of library specialization at the research level, including the place of microfilms and the central storage warehouse for little-used books. The importance of the national union catalogue in the Library of Congress was emphasized.

The establishment of the Biblioteca Benjamin Franklin in Mexico City to serve as a centre of information about American institutions and culture was another evidence of co-operation with Latin America. The library, under the supervision of the American Library association, was to be organized by Harry M. Lydenberg. During 1941 a survey of Canadian libraries in wartime was made, at the request of the Rockefeller foundation, by Charles F. McCombs of the New York Public library. The Rockefeller foundation and the Carnegie corporation continued their generous support of library activities in many fields. Lists of these grants were to be in their annual reports. The Carnegie corporation appropriated (1940–43) $190,000 for the purchase of books for colleges for Negroes ($100,000) and for state colleges ($90,000). The corporation also provided funds for one year for an experimental division of library co-operation in the Library of Congress. A "Memorandum on Library Co-operation," prepared by Herbert A. Kellar, the director, was issued in September. The splendid library of English and American literature gathered by Owen D. Young was presented to the New York Public library as the joint gift of Mr. Young and Dr. Albert A. Berg. In 1940 Dr. Berg gave to the library his own books and those of the late W. T. H. Howe. The Young collection was to be added to these. The Yale University library acquired the important Adrian Van Sinderen collection of Walt Whitman.

The increasing cost of cataloguing books of all sorts with the fullness of detail exemplified in the printed catalogue cards of the Library of Congress had for years been a cause of concern to many librarians. Attention was focused on the problem by the publication of the revised *A.L.A. Catalog Rules*. The fundamental question was admirably discussed by Dr. Andrew D. Osborn of the Harvard College library in a paper, "The Crisis in Cataloging," published in the *Library Quarterly* for Oct. 1941.

Library Training and Personnel.—The 1940–41 report of the board of education for librarianship (A.L.A.) listed 30 schools of various types accredited by the board as meeting its standards; all were connected with teaching institutions. The total enrolment March 1, 1941, was 1,927, including 187 advanced and 209 special or nonmatriculated students. This was a decrease of 232 as compared with 1940. Registration in the library schools might drop further during the war years. For the duration libraries expected to find it difficult to replace members of professional and clerical staffs. Men of military age were expected to be called to service with the armed forces, and many women, particularly in the clerical grades, preferred the higher salaries to be obtained in war industries.

Size of Collections or Statistics of Libraries.—Nineteen libraries in 1941 contained more than 1,000,000 volumes each: the Library of Congress, 6,102,259 volumes (June 30, 1940); the New York Public library, 4,351,136 volumes (comprising reference department, 2,831,334 volumes; circulation department, 1,421,004 volumes; and Municipal Reference library, 98,798 volumes) (Dec. 31, 1941); Harvard university, 4,265,729 volumes (June 30, 1941); Yale university, 3,074,817 volumes (June 30, 1941); Cleveland (Ohio) Public library, 2,112,129 volumes (Dec. 31, 1940); Chicago (Ill.) Public library, 1,892,016 volumes (Dec. 31, 1940); Columbia university (New York city), 1,844,611 volumes (June 30, 1941); Boston (Mass.) Public library, 1,704,729 volumes (Dec. 31, 1939); Los Angeles (Calif.) Public library, 1,641,195 volumes (June 30, 1940); University of California, 1,501,473 volumes (comprising 1,124,858 volumes at Berkeley and 376,615 volumes at Los Angeles) (June 30, 1941); University of Chicago, 1,330,152 volumes (June 30, 1941); Carnegie Library of Pittsburgh (Pa.), 1,319,610 volumes (Dec. 31, 1940); Cincinnati (Ohio) Public library, 1,202,472 volumes (Dec. 31, 1940); University of Illinois, 1,262,046 volumes (June 30, 1941); Brooklyn (N.Y.) Public library, 1,170,280 volumes (June 30, 1940); University of Michigan, 1,134,052 volumes (June 30, 1941); Cornell university (Ithaca, N.Y.), 1,094,117 volumes (June 30, 1941); University of Minnesota, 1,061,965 volumes (1940); Detroit (Mich.) Public library, 1,012,328 volumes (June 30, 1940). Two university libraries, Princeton and Pennsylvania, and two public libraries, Milwaukee and St. Louis, have more than 900,000 volumes each.

These figures were very uncertain standards of comparison because of differences in methods of counting and because public libraries with many branches contained many copies of new and standard books.

Library Buildings.—The larger university and research libraries in the United States double in size every 20 years. Growth of collections outstrips construction of buildings. Even farsighted librarians planning buildings erected after 1900 failed to foresee the geometrical rate of increase, and there were few buildings more than ten years old that were not overcrowded. Because of the high costs of construction and administration, it was not practicable to build new libraries every generation. The question of storage space and the probable future rate of growth was discussed by Keyes D. Metcalf, director of Harvard University library, in his contribution, "Some Trends in Research Libraries," to *W. W. Bishop: a Tribute, 1941*.

One solution suggested was a storage library for little-used books. Harvard, the Boston Public library and other libraries in the Boston region organized the New England Deposit library, a nonprofit corporation. A suitable building with a reading room was under construction at Allston, Mass., on land given by Harvard university. Maintenance charges and construction costs were to be met by income from the rental of space to the participating libraries. The Iowa State college, Ames, constructed a steel storage building (cost, about $20,000; capacity, 150,000 volumes) to house seldom-used books.

The new library for rare books and manuscripts at Harvard university, made possible by the gift of Arthur A. Houghton, Jr., of Corning, N.Y., was completed late in the year and the opening planned for the early part of 1942. Houghton, himself a collector of distinction, was appointed curator of the rare book collection in the Library of Congress in 1940. The Houghton library, as it was to be called, was planned for the safe storage, convenient consultation and attractive display of Harvard's treasures.

The Franklin D. Roosevelt library at Hyde Park, N.Y., was dedicated by the president on June 30. The library, organized primarily to house the official and private papers of President Roosevelt, was built on land given by the president and his mother at a cost of $350,000 contributed by citizens of the entire nation. The library was under the administration of the archivist of the United States, and the director, Fred W. Shipman, was formerly on the staff of the national archives.

Librarians.—Harry M. Lydenberg retired from the directorship of the New York Public library Oct. 1 and was succeeded by Franklin F. Hopper, chief of the circulation department of the library since 1919. Francis R. St. John, assistant librarian of the Enoch Pratt Free library of Baltimore succeeded Hopper. William Warner Bishop, librarian of the University of Michigan since 1915, retired on July 20. Dr. Warner G. Rice, professor of English in the university, was appointed director of the library. Dr. Bishop was president of the International Federation of Library Associations from 1931 to 1936.

Adam Strohm, librarian of the Detroit Public library since 1913, retired on July 1 and was succeeded by Ralph A. Ulveling, associate librarian. On March 1 Matthew Dudgeon retired from the librarianship of the Milwaukee Public library after more than 20 years' service. Dr. Victor H. Paltsits, keeper of manuscripts and chief of the American history division of the New York Public library, well-known to bibliographers and historians, retired June 30 after a long and distinguished career. Miss Isadore G. Mudge, known to all librarians as the compiler of the indispensable *Guide to Reference Books* (6th ed., 1936), retired July 1 after 30 years of service as reference librarian of Columbia university. Charles E. Rush resigned the librarianship of the Cleveland Public library to become director of libraries at the University of North Carolina from Sept. 1. On Nov. 28 Clarence S. Metcalf, business manager of the Cleveland Public library since 1924 and acting librarian since Rush's resignation in March, was appointed librarian for three years. Max Farrand, director of research of the Henry E. Huntington library and art gallery (San Marino, Calif.), retired June 30, and on Nov. 18 Frederick P. Keppel, friend of libraries and scholarship, retired from the presidency of the Carnegie corporation, a position he had filled for 19 years with great distinction. Theodore Wesley Koch, librarian since 1919 of Northwestern university (Evanston, Ill.), died on March 23 only a few months before his retirement age. Bibliographer of Dante and able librarian, Koch was a man of varied gifts; his numerous writings are evidence of his literary ability and the Charles Deering library at Northwestern a monument to his artistic taste. Josephine Adams Rathbone, before her retirement in 1938 vice-director of the Pratt Institute School of Library Science, died on May 17. On May 31 came the news of the death of Augustus H. Shearer, librarian of the Grosvenor library (Buffalo) since 1917. Harriet C. Long, librarian of the Oregon State library (Salem) since 1930, died on July 4. Frank P. Hill, librarian of the Brooklyn Public library from 1901 to 1930, died on Aug. 24 at the age of 86. Earlier, Dr. Hill organized the Newark (N.J.) Free Public library.

Charles W. David was appointed director of libraries at the University of Pennsylvania, a position created to co-ordinate the work of the general library of the university, the departmental libraries and the Philadelphia Bibliographical Center. Mrs. Loleta Dawson Fyan took up the duties of state librarian of Michigan on June 11. Mrs. Fyan, a trained and experienced librarian, succeeded a long line of political appointees. (*See* also AMERICAN LIBRARY ASSOCIATION; CATHOLIC LIBRARY ASSOCIATION.)

BIBLIOGRAPHY.—For further information about American libraries consult: *Bulletin* of the American Library association (Chicago); *Library Journal* (New York); *College and Research Libraries* (Chicago); *Library Quarterly* (Chicago). Important contributions to library literature were: J. L. Wheeler and A. M. Githens, *The American Public Library Building: Its Planning and Design with Special Reference to Its Administration and Service* (1941); H. M. Lydenberg and Andrew Keogh, eds., *William Warner Bishop: a Tribute, 1941* (1941); E. V. Baldwin and W. E. Marcus, *Library Costs and Budgets: A Study of Cost Accounting in Public Libraries* (1941); American Library association catalogue code revision committee, *A.L.A. Catalog Rules: Author and Little Entries . . . Preliminary American 2nd ed.* (1941); C. M. Winchell, ed., *Reference Books, 1938–1940*, 2nd suppl. to Mudge's *Guide, 1936* (1941); C. L. Cannon, ed., *Guide to Library Resources for National Defense*, rev. ed., (1941); R. L. Vormelker, ed., *Special Library Resources* (1941). (C. F. McC.)

Great Britain.—In 1941 the use made of the libraries of Great Britain was greater than ever before. It was obvious throughout the country that the public saw, in the library, an institution of incalculable value freely providing, on the one hand, books of a recreational nature to afford some relief from the strain of war, and, on the other, books and documents of information and ideas, so vitally necessary to a free people in time of war. The circulation of books in public libraries increased in some places by as much as 100%, in many others by 25% to 50%.

The large number of important libraries destroyed or badly damaged by the enemy included those of Birkbeck college, Birmingham Natural History and Philosophical society, Bristol university (anatomical department), City of London college, Goldsmith's college, King's college (London), Manchester Literary and Philosophical society, Royal Empire society, University college (London), and certain sections of the British museum. The upper floors of the National Central library were entirely burnt out and many thousands of books destroyed, including the whole stock of the adult class department and many volumes of series and periodicals. At Plymouth, both the central public library and the Plymouth proprietary library were destroyed, and among many other public libraries which suffered, the most serious losses occurred at Coventry, Hampstead, Liverpool, Lowestoft, Shoreditch and Yarmouth.

Although properly organized general libraries for the forces had not in 1941 been established on any large scale, considerable progress was made in the provision of reading matter for men and women of the three services. The Service Libraries and Books fund, set up at the beginning of the war, had by the end of 1941 already collected more than 10,000,000 books, magazines and periodicals, while most of the public libraries of the country made special provision for camps or isolated units within their area and encouraged all members of the forces to make full use of the various services rendered to the community generally. (D. C. H. J.)

Libya: *see* ITALIAN COLONIAL EMPIRE; WORLD WAR II.

Liechtenstein, an independent but tiny European state, northeast of Switzerland, to which it is united by a customs union. Area 65 sq.mi.; pop. (est. 1940) 11,500. Chief town, Vaduz (capital, pop. 1,710). Ruler: Prince Franz Joseph II, b. 1906, was given ruling authority by his 84-year old uncle, Prince Franz I, on March 30, 1938 and after the latter's death was crowned prince on May 29, 1939. Language, German; religion, mainly Roman Catholic; products: corn, wine, fruit, wood and marble; revenue (1939) 2,099,300 Swiss francs (nearly $500,000), 31% of which was derived from the sale of postage stamps to collectors all over the world. (S. B. F.)

Life Insurance: *see* INSURANCE, LIFE.
Life Span: *see* BIRTH STATISTICS; DEATH STATISTICS; INFANT MORTALITY; SUICIDE STATISTICS.
Lighthouse Service: *see* COAST GUARD, U.S.
Lighting: *see* ELECTRICAL INDUSTRIES; MOTION PICTURES.

Lime. Production of lime in the United States in 1940 rose to a new record high of 4,886,929 short tons, against 4,254,348 tons in 1939. Of the total 71% was quicklime and 29% hydrated lime; agricultural uses took 8%, building 21%, metallurgical uses 20%, chemical uses 34% and refractory uses 18%. Small amounts of lime are imported, but are more than offset by exports. (G. A. Ro.)

Limes: *see* LEMONS AND LIMES.
Limestone: *see* STONE.

Lindbergh, Charles A. (1902–), U.S. aviator, was born Feb. 4 in Detroit, Mich. (See *Encyclopædia Britannica.*) He returned to the United States from England in 1939 and resumed his work for the U.S. air corps. Meanwhile, he publicly advocated strict U.S. neutrality in World War II. In April 1941, he joined the America First committee, and later that month he resigned his commission in the air corps, declaring that President Roosevelt's remarks concerning his loyalty left him "no other alternative." On Sept. 11, 1941, Lindbergh charged at an America First rally in Des Moines that "the three most important groups which have been pressing the United States toward war are the British, the Jewish and the Roosevelt administration." Although this remark was widely circulated as anti-Semitic, Lindbergh's associates strongly denied that it was to be interpreted as such. After the Pearl Harbor incident in Dec. 1941, Lindbergh said in part: ". . . we must meet it (the war) as united Americans regardless of our attitude in the past . . . our country has been attacked by force of arms and by force of arms we must retaliate." On Dec. 30, 1941, Lt. Gen. Arnold of the U.S. air corps said that Lindbergh had volunteered his services to the air force and urged acceptance of the flier's offer.

CHARLES A. LINDBERGH addressing a rally of the America First committee Aug. 9, 1941 at Cleveland, Ohio

Linen and Flax. Development of new material sources was the principal interest in the linen and flax industry of the world during 1941. The cutting off of the older flax-growing countries from world trade had previously resulted in a series of experiments in other areas of the world to produce an adequate supply of flax for threads and fabrics manufactured in Great Britain and in the U.S. During 1941, the new production was reported as exceeding expectations.

New Zealand.—New Zealand increased its original acreage of 100 to 14,000 during the fall of 1940 and to 25,000 in 1941. Annual production was about 5,000 tons but this was expected to increase to 15,000 within two years. The plantings were confined to the South island. North island crops did not prove successful. The cost of this promotion was estimated at approximately £NZ1,000,000 ($3,250,000 U.S. currency), including the construction and equipment of 17 retting plants, where the straw was tank-retted. The entire output was contracted for by the British government.

Peru.—In Peru, a considerable increase was expected over the 1940 production of about 75 tons of good grade fibre and an equal quantity of tow and waste. As in the New Zealand movement, a Belgian flax expert was engaged by the Peruvian government to take charge of its initial experiments and an agricultural association of Peruvian growers was successful in securing government aid in erecting additional flax processing machinery to take care of the anticipated crop. The cost would eventually be repaid by the growers by an increased charge of about 20% for the use of government-owned processing machinery. The crop went to the United States, which provided the seed.

Ireland.—In Ireland, almost 16,000 ac. were devoted to flax growing in 1941, eight times as much as three years before and a substantial increase over 1940 (10,000 ac.). Producers were guaranteed a price of 26 to 32½ cents a pound and the increase in acreage and production necessitated installing additional scutching mills and other processing equipment. About 1,200 workers were expected for the winter (1941–42) operations. The crop was sold largely to Northern Ireland, since Eire had no actual spinning mills. The flax harvest for 1941 for the first time saw the general use of mechanical pulling. What five men could ordinarily do in five days, one machine accomplished in three hours. In the 1941 harvest, in Ireland, 160 machines were used.

Egypt.—The Egyptian flax crop was a substantial contribution to the

new supply of fibre. The acreage of 31,000 planted was more than three times the 1939 planting, and the profitable results (1,800 kg. of straw and 300 kg. of seed per ac.) promised that the acreage would be increased materially during 1942, the estimate being made of 50,000 ac. All of it was contracted for by Great Britain.

Spinning and Weaving.—The spinning and weaving of linen products was progressively difficult. As early as Jan. 1941, Ulster mills were reported as turning to cotton and a month later, it was said that the usual demand for dress linens was lacking, because of "great prominence given in the United States to the attractive designs in cotton and rayon." Later in the year, an improved market for table damask developed from the United States but buying was concentrated on the more popular-priced merchandise, cheap towelling, etc. A new field of demand came from ecclesiastical sources. Wide linen sheetings formerly coming from Belgium were sought in Irish markets. A reflection of wartime was seen in the report printed on June 15, that the "Flax Control board is preparing to give facilities for the release of material required to replace goods lost in last month's blitz." Of the total Irish manufacturing capacity, linen thread covered 60%, and 50% of all linen production went for government requirements. While demand was slow from Latin America and the British colonial areas, buyers from the United States in the latter half of the year created an active market in the better grades of fabrics, with prices 150% above prewar levels. To the Irish market, a demand at this price level indicated that linen fabrics had not lost their popular appeal, since similar products of American rayon and cotton had not increased more than 20% in price during the same period. The preference for linen was emphasized by an increase of 20% in retail sales in the United States. The fine linen trade at the end of 1941, believed it saw the last of its activity for the duration as far as Britain and its allies were concerned.

In the nazi-dominated world, Belgian flax-weaving mills in Dec. 1941 had been authorized to increase their production from 30% to 70% of capacity. The raw material, fibre-flax straw, was being sent from France and the Netherlands, the shipments from France being estimated at 150,000 tons for the year. (I. L. Bl.)

Lions Clubs, International Association of.

The International Association of Lions Clubs is an association of service clubs, the membership of which is made up of business and professional men. It was formed in Chicago, Ill., on June 7, 1917, and founded by Melvin Jones.

The association in 1941 was composed of approximately 4,300 Lions clubs with a total membership of 150,000 in eight countries: Canada, China, Colombia, Costa Rica, Cuba, Mexico, Panama and the United States. The 1941 annual international convention was held in New Orleans, La.

The purpose of Lions clubs is to recognize community needs, and meet those needs by independent effort or through co-operation with other agencies. They are nonpolitical, nonsectarian. Their activities, supervised by club committees, have eight classifications: Boys and girls; citizenship and patriotism; civic improvements; community betterments; education; health and welfare; safety; sight conservation and blind. From May 1, 1940 to April 30, 1941, a total of 58,789 separate activities were reported by Lions clubs to their international office.

The *Lion Magazine*, issued monthly, is the official publication of the association. International president for the 1941–42 fiscal year was George R. Jordan of Dallas, Tex. Headquarters of the association are at 332 South Michigan avenue, Chicago, Ill., and directed by Secretary-General Melvin Jones. (M. Jo.)

Liquors, Alcoholic.

The most important alcoholic liquors are whisky (or whiskey), gin, rum, brandy and liqueurs. Whisky is distilled from a fermented mash of grains. In American whiskies either corn or rye grain predominates. Scotch whisky is made from barley malt which has acquired during its preparation the "smoky" aroma which is characteristic of it.

Gin or geneva had its origin in Holland. English gin—which was at first a copy of the Dutch product, but is being produced under a modified method—dominates not only the British, but also the general world market. London dry gin is by far the most popular variety. However, the production of gin in the United States is much greater than in England.

Brandy, or more specifically "grape" brandy, was recognized for a long time as almost an exclusive product of France. In particular, the product originating from the Charente district, and which alone is entitled to the designation "cognac," has been considered as a standard for this type of beverage. However, a quite fine quality of grape brandy has been produced in California.

The United States has been for many years the country of greatest production and consumption of potable spirits. Because of existing political conditions, production in practically all foreign countries has been considerably curtailed and consumption also materially reduced. Records for late years have not been obtainable.

Whisky was in 1941 by far the predominant alcoholic beverage in the United States. In the fiscal year ending June 30, 1941, 121,726,000 American proof gallons (or tax gallons) were produced, as against 99,000,000 gal. in the preceding year. The production of brandy was 25,373,000 gal.; rum, 2,615,000 gal.; gin, 5,180,000 gal. and diverse other spirits 20,202,000 gal.

Almost the entire whisky production was concentrated in five states, Kentucky accounting for 56,936,000 gal.; Illinois 21,902,000 gal.; Indiana 20,762,000 gal.; Pennsylvania 9,069,000 gal.; Maryland 5,793,000 gal. and all other states 7,265,000 gal.

The apparent consumption of all alcoholic liquors amounted to 153,480,000 gal. at various proofs ranging predominantly from 86 proof to 100 proof. These consumption figures are expressed in American "wine gallons," which means the volume of liquid as bottled at the respective alcoholic strengths. The various types of liquors making up this total consumption were: American (domestic) whisky 119,911,000 gal.; imported whiskies, 9,725,000 gal. (Scotch 7,479,000 gal., Canadian 2,172,000 gal.); gin, 13,900,000 gal.; rum, 3,635,000 gal.; brandy, 2,482,000 gal.; cordials and liqueurs 3,834,000 gal.

The gin in 1941 was practically all of domestic origin. About 1,801,000 gal. of the rum came from Puerto Rico, and a total of 2,739,000 from outside the United States. There were 502,000 gal. of the brandy imported. (*See* also Brewing and Beer; Wines.)

The United States has been producing for years most of the whisky, with Scotland next, followed by Canada and Ireland. Considerable quantities are turned out in Australia and a few other countries. Production and export in Scotland and Ireland were maintained in 1941, although on a reduced scale. Exports from the United States materially increased with a considerable broadening of the field. (A. J. Li.)

List, Siegmund W. W.

(1880–), German army officer, was born in Oberkirchberg, Bavaria. He attended the military academy in Munich, graduating in 1898, and was commissioned a lieutenant in the Bavarian army in 1900. He attended the artillery and engineering school, 1902–04, and the Royal Bavarian Military academy at Munich, 1908–11. In 1914 he became a captain on the Bavarian general staff and saw service in World War I. In 1927 he was given the rank of colonel, and he was made commander of the infantry school at Dresden in 1930. In 1934 Adolf Hitler appointed him commander of the fourth army district of Dresden. After the Austrian anschluss in 1938, he was put in charge of the Austrian army. He was general commanding the armies of occupation of Czechoslovakia in Oct. 1938 and was governor of Moravia in 1939. He played an important part in the conquest of Poland in Sept. 1939 and was made a field marshal by Hitler after the campaign in France, during which he was commander of the 12th army. Known as a brilliant strategist, he won special renown for his direction of troops through mountainous terrains. Marshal von List was in command of German armies on the Moscow front during the Russo-German campaign of 1941. In early battles his forces pressed beyond Moshaisk in the drive on the Soviet capital, but powerful Russian counterdrives compelled him to retreat in the winter of 1941.

Literary Prizes.

The following are the principal literary prizes and awards of the year 1941:

International.—NOBEL PRIZE FOR LITERATURE not awarded since 1939.

United States.—AMES PRIZE (Harvard Law school), to Professor James C. Bonbright of Columbia university and Professor Isaiah L. Sharfman of the University of Michigan for distinguished writing in the legal field. JOHN ANISFIELD AWARD (*Saturday Review of Literature*) to Louis Adamic for his book, *From Many Lands* (Harper), $1,000 for the outstanding book on race relations. ATLANTIC MONTHLY PRESS NON-FICTION PRIZE to Edith M. Almedingen for her autobiography *Tomorrow Will Come* (Little), $3,000 and royalties. ATLANTIC MONTHLY SHORT STORY PRIZE to John D. Weaver for *Clouds of Glory*, $1,000 for the best short story by writers in their 20s. GEORGE LOUIS BEER PRIZE (American Historical association) to Richard H. Heindel for his book, *The American Impact on Great Britain, 1898–1914*, $240. BROSS PRIZE (Lake Forest college, Ill.) to Harris Franklin Rall for his book, *Christianity: An Inquiry into Its Nature and Truth* (Scribner), $15,000. CATHOLIC LITERARY AWARD (Gallery of Living Catholic Authors, Webster Groves, Mo.) to the late Eric Gill for his *Autobiography* (Devin-Adair), an honorary scroll. CHICAGO FOUNDATION FOR LITERATURE to Professor Percy Holmes Boynton of the University of Chicago for distinguished service to literature. COMMONWEALTH CLUB OF CALIFORNIA.—GOLD MEDAL GENERAL LITERATURE PRIZE to Stewart Edward White for his *Wild Geese Calling* (Doubleday); GOLD MEDAL SCHOLARSHIP PRIZE to Carl Thurston for *The Structure of Art* (Univ. of Chicago press); SILVER MEDALS to Kenneth Rexroth for his poetry, *In What Hour* (Macmillan); to Doris Gates for her juvenile, *Blue Willow* (Viking); to Harold Lamb for *The March of the Barbarians* (Doubleday); to William Saroyan for *My Name is Aram* (Harcourt); and to Thomas A. Bailey for *A Diplomatic History of the American People* (Crofts). DODD, MEAD PRIZES.—THE INTER-COLLEGIATE LITERARY FELLOWSHIP to Maureen Daly for *Seventeenth Summer;* RED BADGE DETECTIVE PRIZE to Susannah Shane for *Lady in Lilac* and to Eleanore Kelly Sellars for *Murder à la Mode;* WESTERN STORY NOVEL PRIZE to Peter Dawson for *The Crimson Horseshoe.* FRIENDS OF AMERICAN WRITERS AWARD to Marcus Goodrich for *Delilah* (Farrar), $1,000 to promote high standards and ideals in American writing. GREYSTONE BOOKMAN'S PRIZE to Albert Idell for *Pug* (Greystone). HARPER NOVEL PRIZE to Judith Kelly for *Marriage Is a Private Affair*, $10,000. O. HENRY MEMORIAL AWARD (Doubleday, Doran), $300 to Kay Boyle for her story, *Defeat;* $200 to Eudora Welty for *A Worn Path;* $100 to Hallie Southgate Abbett for *Eighteenth Summer;* $100 to Andy Logan for *The Visit* (first published story). AVERY AND JULE HOPWOOD AWARDS (University of Michigan) to Beatrice Borst for her novel, *Nearer the Earth* (Random). HOUGHTON MIFFLIN LIFE IN AMERICA AWARDS to Agnes Morley Cleaveland for *No Life For a Lady;* and to Donald Culross Peattie for *The Road of a Naturalist.* THOMAS JEFFERSON SOUTHERN AWARDS (Dutton) to Elizabeth Lee Wheaton for *Mr. George's Joint;* a silver medal to Eloise Liddon for *Some Lose Their Way.* ALFRED A. KNOPF LITERARY FELLOWSHIPS, for fiction to Berenice D. Thorpe for *Reunion at Strawberry Hill;* for history to W. E. Binkley for a history of American political parties; for biography to Mitchell V. Charnley for a biography of Thurlow Weed. LATIN AMERICAN PRIZE (Pan American union) to Ciro Alegria for his novel, *Broad and Alien is the World* (Farrar), $2,500. LIMITED EDITIONS CLUB GOLD MEDAL to Ernest Hemingway for his novel, *For Whom the Bell Tolls* (Scribner). NATIONAL BOOK AWARDS (American Booksellers Association), to Richard Llewellyn for the Booksellers' Favourite Novel, *How Green Was My Valley* (Macmillan); to the late Hans Zinsser for the Booksellers' Favourite Non-Fiction, *As I Remember Him* (Little); to Perry Burgess for the Booksellers' Discovery, *Who Walk Alone* (Holt). N.Y. DRAMA CRITICS' AWARD to Lillian Hellman for *Watch On the Rhine* (Random); to Emlyn Williams for the best play from abroad, *The Corn Is Green* (Random). N.Y. UNIVERSITY SOCIETY FOR LIBRARIES GOLD MEDAL to Perry Burgess for *Who Walk Alone* (Holt). PARENTS' MAGAZINE MEDALS to Florence Powdermaker and Louise Ireland Grimes for their *Children In The Family* (Farrar); to Lois Hayden Meek for *Your Child's Development and Guidance, Told in Pictures* (Lippincott). PULITZER PRIZES.—Novel, no award; drama, to Robert E. Sherwood for *There Shall Be No Night* (Scribner); history, to the late Marcus Lee Hansen for *The Atlantic Migration* (Harvard); biography, to Ola Elizabeth Winslow for *Jonathan Edwards* (Macmillan); poetry, to Leonard Bacon for *Sunderland Capture* (Harper). POETRY MAGAZINE six prizes of $100 each: the LEVINSON PRIZE to Archibald MacLeish for *Discovery of Time;* the GUARANTORS' PRIZE to Paul Engle for *America;* the OSCAR BLUMENTHAL PRIZE to Stanley J. Kunitz for *Six Poems;* the JEANNETTE SEWELL DAVIS PRIZE to Karl J. Shapiro for *Four Poems;* the HARRIET MONROE MEMORIAL PRIZE to A. J. M. Smith for *Three Poems;* the HARRIET MONROE LYRIC PRIZE to Frederick Prokosch for *Three Poems.* REYNAL AND HITCHCOCK NON-FICTION PRIZE to W. T. Stace, Stuart Professor of Philosophy at Princeton for *The Destiny of Western Man*, $2,500. MARY ROBERTS RINEHART MYSTERY NOVEL PRIZE to A. R. Hilliard for *Justice Be Damned* (Farrar). *Saturday Review of Literature* AWARD FOR DISTINGUISHED SERVICE TO AMERICAN LETTERS to Ellen Glasgow. CONSTANCE LINDSAY SKINNER MEDAL (Women's National Book association) to Blair Niles "in appreciation of her fine writing, particularly her books on South America." TEXAS INSTITUTE OF LETTERS BOOK AWARD to George Sessions Perry for *Hold Autumn in Your Hand* (Viking). YALE SERIES OF YOUNGER POETS publication won by Jeremy Ingalls for her manuscript, *The Metaphysical Sword* (Yale).

Great Britain.—JAMES TAIT BLACK MEMORIAL PRIZES to Charles Morgan for his novel, *The Voyage* (Macmillan); and to Hilda Prescott for the biography, *Spanish Tudor* (Columbia), £250 and medal to each. HAWTHORNDEN PRIZE £100 to James Pope-Hennessey for *London Fabric* (Scribner).

Children's Books.—THE CALDECOTT MEDAL FOR THE MOST DISTINGUISHED AMERICAN PICTURE BOOK FOR CHILDREN to Robert Lawson for *They Were Strong and Good* (Viking). THE CARNEGIE MEDAL (British) to Kitty Barne for *Visitors from London* (Dodd). JULIA ELLSWORTH FORD FOUNDATION AWARD (Julian Messner, N.Y.) to Babette Deutsch for *Walt Whitman, Builder for America* (Messner), $2,000. HERALD TRIBUNE CHILDREN'S SPRING BOOK CONTEST, $250 each for a book for younger children, to Ann Nolan Clark for *In My Mother's House* (Viking); for a book for older children, to Mildred Mastin Pace for *Clara Barton* (Scribner); for a book for all ages, to Tom Robinson for his dog story, *Pete* (Viking). JOHN NEWBERY MEDAL (American Library association) to Armstrong Sperry for *Call it Courage* (Macmillan).

Foreign Books. *Russian*—STALIN PRIZE to Mikhail Sholokov for *The Silent Don* (Knopf). *Czech.*—CZECHO-SLOVAK STATE PRIZE to Maurice Hindus for *To Sing With the Angels* (Doubleday). (B. GM.)

Literature: *see* AMERICAN LITERATURE; CANADIAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; GERMAN LITERATURE; ITALIAN LITERATURE; LITERARY PRIZES; PUBLISHING (BOOK); RADIO; SPANISH-AMERICAN LITERATURE.

Lithium Minerals.

In 1940 spodumene was shipped by two producers in South Dakota and one in North Carolina; amblygonite and lepidolite each by one producer in South Dakota; and lithium compounds were recovered as a by-product at the brine operations at Searles lake, Calif. Shipments of the latter decreased, but mine shipments increased, the totals being 1,990 short tons ($97,000) in 1939 and 1,961 tons ($79,679) in 1940. Consumption increased, with a corresponding decrease in stocks.

In South-West Africa the 1940 output included 890 long tons of lepidolite, 252 tons of amblygonite and 40 tons of petalite; exports were 611 tons of lepidolite and 179 tons of amblygonite. No mining was done between June 30, 1940, and March 3, 1941, and the output to the end of the first half of 1941 was 130 tons of amblygonite, of which 50 tons were exported. (G. A. Ro.)

Lithuania.

A Baltic country of northeastern Europe, N. of Poland; at the end of 1941 it was a part of Germany's "Ostland." Area, 22,959 sq.mi. (1940); pop. (Jan. 1, 1940) 2,879,070. (Area and population were slightly increased by boundary adjustments of 1940–41). Chief cities: Vilnius (Vilna, capital, 207,750); Kaunas (actual seat of administration, 152,365). Religion, predominantly Roman Catholic (80·5%). Ruler at the end of 1941 was Commissioner General Adrian von Rintelen, who was made responsible to Reichscommissar Heinrich Lohse of the Ostland.

History.—The kaleidoscopic changes of Lithuanian political history were epitomized in 1941: Under the control of the U.S.S.R. from June 15, 1940, to June 23, 1941, the Lithuanians then staged a revolution and declared independence; the German armies reached Kaunas on June 24, but allowed the independent Lithuanian government to function for about seven weeks; on Aug. 5 this government resigned and the nazi control was complete.

The revolution of June 23 was evidently due not only to the German attack on the U.S.S.R. the preceding day, but also to the deep antagonisms roused in the country by the soviets' mass deportations of national leaders between June 14 and 18. Reports were that as many as 50,000 Lithuanians were killed and 60,000 were shipped to Siberia during the 12 months of Russian occupation, and rumours spread that the intent was to move 50% of the population out of the country. The Russians suppressed the Lithuanian press and religious societies, closed private schools, confiscated the larger farms and factories and removed large numbers of fine-bred cattle. The people were stirred to action, and between June 23 and June 29 they took control of most of the towns from the Russians, who retired before the dual onslaught of Lithuanians and Germans.

To head the new provisional government, Colonel K. Škirpa was elected prime minister. He was the Lithuanian minister to Berlin, and was kept in custody by the nazis, so the post of chief minister was entrusted to Juozas Ambrazevičius, an author and

lecturer in the university of Kaunas. The position of this government was an impossible one after Hitler's proclamation of July 17 setting up the Ostland territory. Herr Lohse's proclamation of July 28, before he left Kaunas for his new seat at Riga, brought matters to a head. Lithuanian appeals of desperation failed, the government resigned on Aug. 5, and after a public ceremony at the Tomb of the Unknown Soldier, Aug. 10, the Germans were left in absolute control.

Outside the country, refugees worked with such groups as the 650,000 Lithuanians in the United States to collect funds and to stimulate opinion in favour of a restored Lithuania after World War II (*q.v.*).

Statistics relating to the economy and social conditions of Lithuania were not issued after the Russian occupation in June 1940; the latest figures available in 1941 pertained to 1939 or earlier years.

Education.—In 1938–39 there were 2,335 private schools with 298,429 scholars, and 83 secondary schools and gymnasia with 19,539 scholars. Part of the university at Kaunas was moved back to Vilna Jan. 15, 1940.

Finance.—The monetary unit is the lita (=16.1 U.S. cents at par, established in 1922 as one-tenth the U.S. gold dollar). In 1939 the budget estimate of the government balanced at 341,785,274 litas. Effects of the German occupation on finance were still uncertain at the end of 1941.

Trade and Communication.—In 1938 imports amounted to 223,686,000 litas, and exports to 233,200,000 litas. Chief articles of import were cotton yarn and thread, woollen yarn and thread, cotton fabrics, woollen fabrics, coal and fertilizers. Chief articles of export were meat, butter, flax fibre, pigs and eggs. Almost 40% of the exports went to Great Britain, 27% to Germany and 5.7% to the U.S.S.R. Imports came 31% from Britain, 24.5% from Germany, 6.7% from the U.S.S.R. and 4.7% from the Netherlands. In 1938 telephones numbered 26,591; radio sets 53,667; broadcasting stations 2.

Agriculture.—Almost 77% of the population is engaged in agriculture, and 49% of the land is arable. Chief products in 1939 and their output in short tons were as follows: rye 726,636; wheat 282,850; barley 282,740; oats 450,841; potatoes 2,290,469; flax fibre 31,416. The 1938 estimate of livestock was: horses 557,540; cattle 1,192,840; sheep 618,980; pigs 1,249,470; poultry 5,130,920. Much of this livestock was reported lost, because of soviet demands, in 1940–41.

Manufacturing.—In 1938 some 1,441 industrial establishments employed 40,818 people. Meat and fish products were valued at 44,919,000 litas; manufactured timber 12,532,000 litas; tissues and yarns 28,131,000 litas; machines, etc. 13,215,000 litas; leather goods 14,374,000 litas. Lithuania lacks mineral resources. (F. D. S.)

Litvinov, Maxim Maximovich (1876–), Russian politician, was born July 17 in Bialystok, Russia. As an agitator and journalist, he devoted himself from youth to revolutionary propaganda. He joined the Social-Democratic party in 1898 and supported Lenin and the bolshevists in the factional clash of 1904. After the revolution (1917) he was the party's plenipotentiary in London, where he was imprisoned as a hostage. He took part in conferences at Genoa and the Hague, led soviet delegations at the 1927, 1928 and 1929 sessions of the preliminary disarmament commissions of the League of Nations and in 1928 signed the Kellogg pact for the U.S.S.R. He was made commissar for foreign affairs in 1930 and championed collective security at League of Nations sessions. He was suddenly dropped from his foreign office post May 3, 1939, in the midst of negotiations with Britain and France for a general mutual assistance pact; the mystery of his ouster was solved in Aug. 1939 when Germany concluded a nonaggression pact with the U.S.S.R. He was expelled from the Communist party Feb. 21, 1941, but returned to favour after the nazis attacked the U.S.S.R., June 22, 1941.

He was appointed soviet ambassador to the U.S. Nov. 6, 1941, and on Dec. 13, 1941, said the U.S.S.R. intended to concentrate on smashing Hitler in Europe and did not immediately envisage opening a second front in the far east.

Liverpool, Arthur William De Brito Savile Foljambe, Earl of (1870–1941), British peer, was born May 27. The earl of Liverpool was fifth holder of the title and second holder since it was revived in 1905 and conferred on his father. He was educated at Eton and the Royal Military college at Sandhurst. He became a second lieutenant in the Rifle Brigade in 1891 and saw service in South Africa, 1901–02. He was governor of New Zealand 1912–1917. He died at his home, Canwick hall, near Lincoln, May 16.

Livestock. The United States livestock industry contributed in record-breaking proportions to the nation's economy in 1941 and at the same time built up flocks and herds to ensure still larger production in 1942. Included in the 1941 output of livestock and livestock production were nearly 19,500,000,000 lb. of meat consumed by the American people. Market prices of $6,305,000,000 received by U.S. farmers (tentative estimate by the U.S. department of agriculture) compared to $4,821,651,000 received by farmers for livestock and livestock products in 1940. Consumption of meat in the United States in 1941 was at an all-time high and was nearly 1,000,000,000 lb. more than in the previous record year of 1940, according to G. A. Schmidt, chairman of the board of the American Meat institute. Per capita consumption of meat in the United States in 1941 was estimated at about 5 lb. more than the per capita consumption of 141 lb. in 1940. A part of the increase was due to augmented buying power from increased employment in industry and transportation and defense activities therein. In addition, the rapidly expanding military forces added materially to meat consumption; U.S. army figures released in 1941 showed that nearly 300 lb. of meat a year was purchased for each soldier. Army per capita consumption of meat was estimated to be more than double that of the per capita consumption of the country as a whole. Production of beef, veal and lamb in 1941 was the largest on record. Pork production was about 5% less than in 1940, but 20% more than the ten-year (1931–40) average. Exports of meat and other livestock products in 1941, chiefly lend-lease shipments to Great Britain, were about three times larger than 1940 exports.

(For lend-lease exports *see* Farm Income; for detailed figures on numbers of livestock and quantities of products *see* Bacon; Butter; Cattle; Cheese; Dairying; Hogs; Horses; Meat; Milk; Poultry; Sheep.)

U.S. Farm Income from Livestock and Livestock Products, 1941 and 1940

	1941	1940
Dairying	$1,860,000,000	$1,526,702,000
Cattle and calves	1,750,000,000	1,380,170,000
Hogs	1,300,000,000	820,802,000
Eggs	610,000,000	449,233,000
Chickens	280,000,000	215,278,000
Sheep and lambs	225,000,000	189,402,000
Wool	143,000,000	110,058,000
Turkeys	82,000,000	76,345,000
Other products	55,000,000	53,667,000

(S.O.R.)

Livestock Shows: *see* Shows.

Llewellyn, Sir William (1863–1941), British portrait painter, was best known for his studies of the late King George V and of Queen Mary. He was president of the Royal academy from 1928 to 1938 and a trustee of the National gallery from 1933 to 1940. Sir William died in London, Jan. 28. (See *Enyclopædia Britannica.*)

Lloyd of Dolobran, George Ambrose Lloyd, 1st Baron (1879–1941), British statesman, was born Sept. 19 at Dolobran, Montgomeryshire, Wales. He was president of the Navy league in 1930 and headed the Seamen's hospitals and the Royal Central Asian society. In 1937 he was named president of the British Council for Cultural Relations with Foreign Countries, an agency for the spread of British "cultural ideas and

ideals" abroad. In 1940 he was appointed secretary of state for colonial affairs in the Churchill ministry; in Jan. 1941 he was appointed leader of the house of lords, but could not assume this post because of illness. A leader of Tory opinion in the house of peers, Baron Lloyd supported the policies of Winston Churchill and frequently criticized the Baldwin and Chamberlain governments, especially with regard to their colonial policy. He strongly disapproved of the proposal to grant India partial self-rule. He denounced the government for concluding a naval pact with Germany in 1935 without consulting France, and he assailed the Munich pact in 1938 as an added "humiliation" to British power.

As president of the British council, he devoted much of his attention to the Balkans and travelled extensively in that region. German newspapers dubbed him the principal British agent in that zone. Among his works are *The Great Opportunity* (1919); *Egypt, Since Cromer*, vol. 1 (1933), vol. 2 (1934); *Leadership in Democracy* (1939) and the *British War Case* (1940), a résumé of British views on war issues. He died in London, Feb. 4. (See *Encyclopædia Britannica.*)

London. In 1941 it was in the first instead of the second half of the year that London was subjected to fierce enemy air attacks. At the end of 1940 (Dec. 29) a deliberate attempt was made to burn the famous square mile known specially as "the city"—an area notable as being devoid of military objectives; large numbers of buildings were wholly or partially destroyed, including the mediaeval Guildhall, eight Wren churches, and many of the halls of the ancient livery companies. After this, compulsory fire watching for all business premises was decreed, and the value of this move was made apparent on Jan. 11, when the enemy made a second attempt with a similar object. Although there were many casualties, especially in two hospitals and a street subway, the incendiary bombs were quickly dealt with and fires were comparatively few. On Jan. 29 and the two following days there were again daylight and night attacks on the London area; early in February the salvage corps was increased from 60 to 600 men. After another lull, in a short but heavy raid on Feb. 17, hundreds of incendiary and many high-explosive bombs were dropped, doing little material damage but causing many casualties.

PRIME MINISTER CHURCHILL inspecting the house of commons after it was gutted by German bombs May 11, 1941

Merseyside, Glasgow, Bristol and other parts of the country then experienced heavy raids, and it was not till March 19 that the *Luftwaffe* returned to London to deliver a large scale attack in which hundreds of houses, shops, and flats, many churches, six hospitals and other public buildings were destroyed or seriously damaged. Another respite, broken only by a few "alerts," followed, till in a widespread series of night raids on April 7 a few bombs fell in the London area, and another hospital was damaged. On April 16 an attack even fiercer and more indiscriminate than those of the previous autumn started at 9 P.M. and continued till 5 in the morning; 500 aircraft were believed to have flown over in continuous waves, and the damage was more widespread than on any previous occasion. Six enemy bombers were brought down—one in Kensington high street. The German claim that 100,000 incendiaries as well as vast quantities of high explosives were dropped was probably not exaggerated. Again material losses were heavy, while among the many people killed were Lord and Lady Stamp and their eldest son, and the earl of Kimberley, formerly known on both sides of the Atlantic as Lord Wodehouse, the international polo player. St. Paul's cathedral suffered severely; the City Temple, St. Andrew's Holborn, and Chelsea old church were among the churches destroyed. Maples' store and Christie's famous auction rooms were among the business premises burnt out. Three nights later (April 19–20) London was again subjected to a seven-hour raid; but, though loss of life was considerable, especially among the firemen and A.R.P. workers, mastery of the fire bomb was becoming more assured.

Londoners then enjoyed three weeks of uneasy peace till on May 10–11—a night of full moon—the *Luftwaffe* made a surprise effort. In a raid during which London seemed ablaze from the docks to Westminster, much damage was done, and casualties were high. The house of commons, Westminster abbey and the roof of Westminster hall were severely damaged, the Temple was almost devastated and the British museum also suffered damage. But victory remained with the defense workers and firefighters of London, and 33 of the destroyers' planes were destroyed.

Daylight raids over London had already ceased before the end of April, and from May 10 there was a long lull. Except that on July 27–28 a small number of bombers—four of which were brought down—did slight damage in residential areas and caused some civilian casualties, no bomb was dropped or siren heard in London up to mid-October. Full advantage was taken of the respite, especially by the fire-fighting, civil defense and demolition authorities; restaurants, places of amusement and night clubs began to function again, and the promenade concerts at the Albert hall had a record season.

By the end of the second year of war the changes in London were very marked. Large, irregular, and for weeks untidy, open spaces had taken the place of crowded dwellings and prosperous business and shopping thoroughfares; huge watertanks and shelters—surface and underground—were everywhere; 80 of the tube stations, with their tiers of bunks, canteens, first-aid posts and aproned welfare workers had become glorified doss-houses. In the streets well-known statues had been "evacuated"; "British restaurants," communal kitchens, and mobile canteens were to be seen; many railings disappeared, and uniforms of every kind, including those of the Allied and overseas forces, were more and more noticeable. An important, but not at first sight obvious, change was the passing, under the fire services (emergency provisions) act, 1941, of the London fire brigade from the control of the London county council to that of the home office. Another matter for remark was the speed with which local authorities, bombed hospitals and the public at large accommodated themselves to the new conditions. By the end of June, 43 hospitals had been severely damaged in the metropolitan area, and 30 less seriously. The ratio of destruction of property and of casualties in London, said Henry Willink, the special commissioner for the civil defense region, in June, was eight times as great as in the rest of the country. But in spite of complex problems the rehousing, reclothing and general "reconditioning" of those rendered homeless was dealt with by London's 95 local authorities more speedily and more successfully after the tragic experiences of April and May than after any of the earlier raids.

It is impossible to name more than a few of the damaged areas and treasures lost in addition to those already mentioned. The many churches and places of worship destroyed or very badly damaged included: St. Mary-le-Bow (of "Bow Bells" fame), St. Bride's, Fleet street ("the journalists' cathedral"), All Hallows, Barking (the Toc H church), Christ church, Newgate street (Wren; famed for its Spital sermon and its connection with the Bluecoat school), St. Mildred's, Bread street (with its Australian memorial), St. Albans, Wood street (Wren), and St. James's Garlickhithe (Wren)—all in the city; also St. Clement Danes (of the "oranges and lemons" rhyme), in the Strand; the Temple church (largely 12th century), St. Alban's, Holborn, St. John the Evangelist, Waterloo road, St. Mary's, Newington, St. Columba's, Pont street, St. George's cathedral (R.C.), Southwark, Spurgeon's tabernacle, the Salvation army headquarters, and the central synagogue in Great Portland street. Non-ecclesiastical memorials demolished included: the Tudor building of the Charterhouse and the house in Charterhouse square that was Catherine Parr's home before she became a queen of Henry VIII; many of the mediaeval portions of Westminster school, also the deanery, and the 17th century Greycoat hospital, a Westminster charity foundation; the Temple, Lincoln's Inn, and Gray's Inn; Dr. Johnson's house off Fleet street, and Neville's court nearby, which had remained almost unchanged since its rebuilding after the great fire of 1666.

Among official and other public buildings: the Law courts, the central criminal court ("the Old Bailey"), the Bankruptcy court, the London sessions house and the Clerkenwell county court; the Guildhall, the county hall and Westminster city hall, the National Central library and the School of Tropical Medicine in Bloomsbury, and the Florence Nightingale International Federation centre in Manchester square; the Royal Empire society,

the Royal Society of Arts, the Royal Academy of Dramatic Art, and the headquarters of the Independent Labour party, most of them with their large specialized libraries; Broadcasting House, the Queen's hall, with its valuable collection of hundreds of musical instruments, St. George's hall, with the B.B.C. organ; the music museum in Bloomsbury and some galleries of the natural history museum and the science museum in South Kensington.

In March G. G. Ammon, a well-known Labour M.P. and former organizing secretary of a trade union and parliamentary secretary to the admiralty in the two Labour administrations, succeeded A. E. Davies as chairman of the London county council; C. W. Gibson was elected vice-chairman, and Charles Latham continued in office as leader.

The annual estimates were up by £5,750,000 to £51,276,714, but of this amount nearly £26,950,000 was covered by receipts in aid and exchequer grants and more than £2,750,000 by balances, leaving £21,570,000 (a reduction of some £2,000,000) to come from the rates, which were reduced by 6*d.* to 7*s.*0½*d.*, adequate provision having been made for the maintenance of all the social services. Of the total, civil defense took £16,947,000 (an increase of nearly £7,940,000 over the previous estimate), of which all but £1,160,255 would be met by exchequer grants and other income. Apart from this the principal items included for emergency purposes were: £5,567,700 for debris disposal, £1,650,000 for rest centres, and £50,000 for meal service. At the end of June, when it was reported that the council had already voted and spent £750,000 for the repair of war damage and £1,500,000 on urgent miscellaneous necessities, it had to ask for a further £100,000 in respect of war damage repair, £250,000 to meet similar items and capital expenditure, and £1,000,000 for urgent miscellaneous matters. Total capital expenditure for 1941–42 was estimated at £3,756,000 (a decrease of more than £4,000,000), with another £1,000,000 as reserve. The council's gross debt was £138,078,000, and the net outstanding loan about £89,416,000.

There was an increase from 7% to 8½% in the Londoner's water-rate—the concern of the Metropolitan Water board, not the county council. This represented on a £50 house an extra 15*s.*2*d.* annually, and was accounted for by the large increases in rates and taxes payable by the board, by the price of coal and particularly by additional expenditure due to A.R.P. and the reduction of population through evacuation. (L. H. D.)

London University. Few important changes could be recorded in 1941. The university remained dispersed but much continued to be done in London, especially in science, technology and oriental studies. Bombing in London and elsewhere caused considerable damage to university property, both buildings and libraries. The number of students in engineering increased by about 10% and in science by 5%, but the demands of the armed forces caused a heavy drop in non-scientific faculties, particularly economics. More teachers proceeded to other forms of national service. No new chairs were created but some vacancies were filled, so that essential work did not suffer unduly and research by no means ceased. The standard of work was generally better than in the pre-war years. Colleges played a full part in the various government schemes for training specialists. Military or royal air force training was made compulsory for all men students of military age not specially exempted. The principal, H. L. Eason, retired and H. Claughton was appointed acting principal. (S. J. W.)

"Lone Ranger": *see* GRASER, EARLE W.

Los Angeles. Fifth largest city of the U.S.A., Los Angeles, Calif., had a population of 1,504,277 by the federal census of 1940, and an estimated population of 1,625,000 in 1941. The aircraft industry boom brought thousands weekly to Los Angeles in 1941. Five major firms—Douglas, Lockheed-Vega, North American, Northrup, Vultee—with lesser plants totalled an investment of $80,000,000 in 1941 and had 150,000 employees and a $21,000,000 monthly payroll. One-half the country's aircraft production was located in this vicinity in 1941. A new municipal airport, under construction during the year, represents a total investment of $7,500,000. Mayor (Jan. 1, 1942): Fletcher Bowron.

The dedication of Crowley lake, 300 mi. distant, on Oct. 19, 1941, added enough water for domestic needs for an entire year. Colorado river water flowed into the city reservoir June 20, marking the completion of a $220,000,000 project. Contracts put into effect the Boulder Canyon Project Adjustment act and stimulated a greater expansion of basic industries. The unprecedented demand for cheap housing brought about extensive projects, and new impetus was given to metropolitan planning. Defense plans were greatly accelerated by the war against Japan. Many Japanese nationals in Los Angeles were arrested by F.B.I. agents after the outbreak of war, and air-raid precautions were redoubled.

Bank clearings approximated $13,000,000 in 1941, a 17½% gain over 1940. Building permits showed a corresponding gain, but stock exchange sales showed a sharp decline. (R. D. Hu.)

Loudon, Hugo (1860?–1941), Netherlands oil and rubber executive, was born in The Hague. He went to school in Delft, where he received a degree in civil engineering in 1885. He served as head administrator of the Royal Dutch company, 1894–1902, and as manager, 1902–21. In 1921 he was made a member of the company's board of directors and in 1929 he became president of the board. Loudon also had wide interests in tobacco and rubber companies in the Dutch colonies. He died in the Netherlands, Sept. 6, according to a dispatch from Willemstad, Curaçao.

Louisiana. One of the west south central states of the United States of America, admitted to the union in 1812 as the 18th state, Louisiana is popularly known as the "Pelican state," "Creole state" or "Bayou state." Total area 48,523 sq.mi., of which 45,177 sq.mi. are land; population (1940) 2,363,880, of which 1,383,441 or 58·5% were rural and 980,439 or 41·5% urban; 64% native whites, 34·3% Negroes and 1·7% foreign born. Capital, Baton Rouge, 34,719. Other important cities are: New Orleans, 494,537; Shreveport, 98,167; Monroe, 28,309; Alexandria, 27,066; Lake Charles, 21,207; Lafayette, 19,210; Bogalusa, 14,604; New Iberia, 13,747; Gretna, 10,879.

History.—No session of the legislature and no important elections were held in 1941. The chief political movements were the attacks by the ousted Long faction upon the constitutionality of much of the reform legislation enacted in 1940, and attempts to halt the investigation of political scandals. The state supreme court upheld some of the reform measures and invalidated others; and numerous court actions were pending at the end of the year.

The national defense program accounted for much of the construction work in the state in 1941. Existing army training camps were enlarged, several new ones were constructed, and new airfields were established. Industrial plants engaged in defense production were expanded, and additional ones were built. Access roads were built in the vicinities of the new army camps, and housing facilities were greatly expanded near the camps, airfields and defense industries. From August to October 500,000 soldiers participated in elaborate military manoeuvres in Louisiana. Work was begun on an oil pipe line from Baton Rouge to the Atlantic seaboard, as a phase of the defense program.

State officers in 1941 were Sam Houston Jones, governor; Mark M. Mouton, lieutenant governor; James A. Gremillion, secretary of state; A. P. Tugwell, treasurer; L. B. Baynard, auditor; Eugene Stanley, attorney general.

Education.—Education is free and compulsory for all children. Separate schools are maintained for whites and Negroes. The public elementary schools enrolled 212,000 white and 158,000 Negro pupils in 1941: public high schools had 83,000 white and 15,000 Negro students; 10,750 white and 4,150 Negro teachers were employed in the public schools. Emphasis is placed upon vocational training, and the state maintains nine public trade schools. The state expenditure for elementary and secondary education exceeds $28,000,000 annually. Numerous private and parochial schools enrol 50,000 elementary and 10,000 high school pupils.

Louisiana state university at Baton Rouge, with 654 teachers and 8,426 students in 1941, heads the public school system for whites; Southern university at Scotlandville, with 54 teachers and 881 students, heads the public school system for Negroes. Louisiana state normal college at Natchitoches, Louisiana Polytechnic institute at Ruston, Southwestern Louisiana institute at Lafayette and Southeastern Louisiana college at Hammond are state-supported colleges and teacher-training schools for whites, with a total of 400 teachers and 7,000 students. Tulane university (endowed) and Loyola university (Roman Catholic) at New Orleans,

Centenary college (Methodist) at Shreveport and Louisiana college (Baptist) at Pineville, with a total of 800 teachers and 7,500 students, are other important colleges for whites. Dillard university (endowed) and Xavier university (Roman Catholic) at New Orleans, and Leland college (Baptist) at Baker, with a total of 75 teachers and 1,000 students, are important nonstate colleges for Negroes. Annual state expenditure for higher education is about $9,400,000.

Public Welfare, Charities, Correction.—In 1940, 5,398 CCC enrollees received $358,000; 7,874 received $191,000 in NYA assistance; 24,783 received $1,274,000 on WPA, and 6,464 received $646,000 on other federal works projects; 31,882 received $379,000 in old-age assistance; 13,081 families and 36,575 children received $310,000 in mothers' and children's aid; 1,067 received $16,000 in blind pensions; 9,677 received $141,000 in general relief; 528 received $12,000 from the FSA; 133,000 received $5,940,000 in unemployment insurance.

The state maintains the following: charity hospitals at New Orleans, Shreveport, Lafayette, Pineville, Independence and Monroe; insane hospitals at Jackson and Pineville; a tuberculosis sanitarium at Greenwell Springs; schools for the blind and deaf at Baton Rouge; training school for feeble minded at Alexandria; soldiers' home at New Orleans.

There are also numerous private and endowed hospitals and orphanages. The state maintains two prison farms for its 3,300 adult offenders and separate training institutes for 200 male and female juvenile delinquents.

Annual state appropriations for public welfare, charities and correction exceed $21,000,000.

Communication.—There were, in 1941, 18,000 mi. of state highways, 4,000 mi. of which were paved and 10,000 gravelled; about $25,000,000 is expended annually on state highways. The state had 4,500 mi. of railways and 4,800 mi. of navigable waterways in 1941. New Orleans, Baton Rouge and Lake Charles are ports for ocean-going commerce, with tonnages in 1940 shown in Table I.

Table I.—*Tonnage of Ocean-going Commerce for Louisiana Ports, 1940*

Ports	Tonnage, foreign	Tonnage, coastwise
New Orleans	5,780,000	5,700,000
Baton Rouge	1,257,000	3,505,000
Lake Charles	479,000	2,282,000

There were 24 airports for land planes and one base and eight anchorages for sea planes in 1941. Barksdale field near Shreveport is a leading U.S. army air base.

Air-mail and passenger lines connect New Orleans and other Louisiana cities with all parts of the country.

There are 175,000 telephones in the state.

Banking and Finance.—Louisiana had 29 national banks in 1940, with assets of $415,739,000, deposits of $382,191,000, and capital, surplus and reserves of $30,521,000; and 117 state banks, with assets of $143,361,000, deposits of $122,609,000, and capital, surplus and reserves of $20,579,000. There were 74 savings and loan associations, with total assets of $90,074,000. Postal savings totalled $9,000,000. The state budget for the fiscal year 1940–41 was $117,414,000, with receipts and expenditures balanced. Gross state debt, $130,000,000; net debt, $126,000,000.

Agriculture.—The total value of agricultural production in 1941 was $80,000,000; total acreage harvested, 4,155,000. Cash income from crops and livestock, $103,000,000; from government payments, $17,000,000. Weather conditions during 1941 were generally favourable for agriculture.

Table II.—*Leading Agricultural Products of Louisiana, 1940 and 1939*

Crop	1940	1939
Cotton, bales	455,000	745,000
Corn, bu.	24,128,000	23,325,000
Rice, bu.	18,040,000	20,597,000
Oats, bu.	1,984,000	1,664,000
Sugar cane, tons	3,335,000	5,060,000
Hay, tons	458,000	431,000
Sweet potatoes, bu.	4,988,000	6,935,000
Irish potatoes, bu.	2,280,000	2,106,000
Soybeans, bu.	234,000	243,000
Peanuts, lb.	16,740,000	18,800,000

Manufacturing.—About 1,900 industrial establishments, employing nearly 100,000 workers and paying $100,000,000 in wages, produced finished products worth more than $600,000,000 during 1941. In 1939, products were valued at $565,265,273; in 1937, $580,839,828. Statistics of the U.S. biennial census of manufactures for 1939 (preliminary) and for 1937 are given in Table III.

Table III.—*Principal Industries of Louisiana, 1939 and 1937*

Industry	Value of Products	
	1939	1937
Petroleum refining	$109,627,341	$122,151,945
Cane-sugar refining	66,673,546	74,463,193
Lumber and timber products	43,940,491	44,496,047
Paper	25,650,456	28,558,171
Rice cleaning and polishing	17,296,826	17,808,261
Pulp	13,816,560	13,747,984
Bread and bakery products	14,517,493	13,884,963
Bags, other than paper	10,741,090	13,386,384
Cottonseed products	7,823,552	12,702,413
Chemicals	32,506,506	11,097,316
Malt liquors	10,662,514	6,664,155
Nonalcoholic beverages	11,013,503	9,015,060
Printing and publishing	12,176,042	12,239,638
Paper bags and cardboard boxes	10,281,718	14,211,433

Mineral Production.—Total value of mineral production in Louisiana for 1941 was about $200,000,000. New petroleum deposits were developed during the year, principally in the southern part of the state.

Table IV.—*Principal Mineral Products of Louisiana, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Petroleum	$103,961,000	$ 95,746,380
Natural gas	71,928,000	65,350,140
Natural gasoline	3,857,000	3,329,000
Sulphur	8,206,960	6,761,000
Salt	2,804,406	2,830,331
Totals for years	$190,757,366	$174,016,851

(W. PR.)

Lo Wen-kan (1888–1941), Chinese statesman, was born in Pangyu in Kwangtung province, China. He received his M.A. degree at Oxford and studied law in London. He was minister of justice in 1921, 1926 and 1932–34, and was president of the Peking supreme court and finance minister in 1922. He was also foreign minister in 1928, and from 1932 to 1933. Lo vainly appealed to the League of Nations to halt Japanese aggression in China, but later declared that China could not depend upon outside help and had to rely upon her own resources. He died in northern Kwangtung province, Oct. 16.

Lozovsky, Solomon Abramovich (PSEUDONYM OF A. S. DRIDSO.) (1878–), Russian politician. He became an active revolutionary in 1900, organized Social-Democratic party clubs among railroad workers, and was arrested. He escaped, however, and lived abroad until the outbreak of the revolution. In 1917 he returned to the U.S.S.R. and devoted his energies to the organization of the Russian and the international trade union movements. In June 1939, Lozovsky was appointed vice-commissar for foreign affairs, and in June 1941, at the outbreak of the Russo-German war, he became assistant director of the Soviet Information bureau. Lozovsky frequently regaled foreign newspaper correspondents in Moscow with acid comment on Hitler's victory claims. He derided nazi claims of gains and casualties, described the German blitzkrieg as a "washout" and said Hitler would only capture Moscow "when he can see the backs of his ears."

Lumber. The U.S. lumber industry was in 1941 called upon to supply a large share of the construction requirements of the defense program. The industry satisfactorily met the demands for both defense and civilian requirements. Some mills over-sold their production and refused new business.

Lumber production during July 1941 was at the highest level since 1929. The demand for lumber was not expected to decrease. Its use for the construction of troop barracks, airports, shipbuilding and other army and navy requirements as well as for munition boxes and packages, factories and other requirements incident to the defense program was likely to continue. Industrial and private dwelling construction was likely to decrease because of governmental restrictions.

Ceiling prices were established for many of the sizes and grades principally in demand. Some exceptions were made to provide for extraordinary circumstances. The U.S. government requested the West Coast Lumbermen's association in July to increase its production. This increase in August, over July, amounted to 18%. The normally active intercoastal lumber trade continued to be very quiet due to lack of available ship space; the increase of lumber shipments by rail from the Pacific Northwest was proportionately large.

The price of wholesale construction lumber, using the 1926 figure as 100, averaged 122.3 during July, the highest monthly average of any month since 1923. The peak prices of all time for lumber were reached in 1920, and were far above 1941 levels.

War conditions continued to prevent free movement of lumber to other countries. A strong demand existed but it was difficult to do business because of lack of available shipping facilities. Exports of lumber definitely decreased, but imports increased because of the availability of ship bottoms bringing in return cargoes.

Lumber production during 1941 was estimated at 31,500,000,000 bd.ft., which was about 4,500,000,000 above production in 1940. The production of western pine, including ponderosa, sugar and Idaho pines, was estimated at 6,000,000,000 bd.ft.; Douglas fir, western hemlock and associated species 8,500,000,000 bd.ft. and southern pine at 9,000,000,000 bd.ft.

Attractive prices brought many small mills into production, particularly in the southern pine and hardwood regions, the northeast and the lake states. Although the production of the individual small mill may be only from 500,000 to 3,000,000 bd.ft. each year, the total increased production from these small mills may result in billions of total production and probably equal to about 40% of the total national production. It is estimated that approximately 3,000 additional small sawmills came into production during 1941.

As the national economy became further disturbed by defense measures and war priorities, the lumber industry was in a position to supply many materials to replace metals vitally needed for defense industries. Timber connector construction, for example, was being widely used for huge military warehouses and storehouses as well as for aeroplane hangars, bridges and many other structural forms. About 7,000,000,000 bd.ft. of lumber were used for the defense program of 1941. This included purchases by the war and navy departments as well as contractors and industries engaged in the defense program. (N. C. B.)

British Empire.—Great Britain, cut off from all European sources of supply after May 1940, when the last of the Scandinavian shipments were made, continued throughout 1941 to rely upon imports from Canada, from the United States and from the British Colonies, and upon the ever-expanding output of the home woods. Such are the curious twists in wartime, however, that toward the end of the year some wood from an unexpected quarter became available for Britain. In October a convoy which took British war material to the soviet union returned to Britain with cargo mainly of timber.

British timber stocks, carefully conserved from the outbreak of war and utilized only under licence, were adequate for essential needs. Purchases by the government timber controller from Canada slackened in the early part of the year, but Canadian producers and shippers found a ready compensating balance in the great demand for timber in the dominion itself for hangars and buildings in connection with the empire air training scheme, and for war industries' developments on the grand scale, and in the increased call for timber in the United States. Canada supplied great quantities of Sitka spruce and yellow birch for use in aircraft, and aircraft veneer production in the dominion made astonishing progress. In the latter half of the year the British timber controller was again active in buying in Canada.

Government timber control became operative in Britain as soon as war was declared. Canada, too, set up a timber control department, and similar steps were taken in Australia and New Zealand. The control was designed in each case to regulate the trade in the national interest. Price control figured in the plan, the aim being to prevent inflation and speculation.

Home timber production in Britain was calculated to show a sevenfold increase in 1941 over pre-war output. To the normal civilian labour employed in the woodlands were added the activities of the Canadian Forestry corps, and forestry companies from New Zealand and Australia, all the personnel being drawn from skilled woodmen and mill-men in the dominions and all militarily trained. In addition there were fellers from Newfoundland and another large body from British Honduras; while sections of the Women's Land army were also devoting themselves to forestry work. The Canadian, New Zealand and Australian forestry units constructed their own mills, and their output—big and constantly growing, as more production facilities were provided—were making notable contributions to Britain's timber needs.

Distribution in Britain (from stocks well dispersed for safety) was maintained through the usual trade channels, and by a system of "pools" all engaged in the trade had a share in the remuneration provided by the government for the wharfing and distribution work. (*See* also FORESTS.) (N. F.)

Lutherans. The year 1941 intensified and extended problems for the Lutheran church throughout the world, perhaps in greater degree than for any other church. This was true because its membership was so extensively involved by citizenship in countries at war, and because the church in Scandinavian and in other European countries, besides Germany, was cut off from their large missions in foreign lands. At the same time conditions in the orient made the mission work of the Lutheran church in America increasingly difficult, with added responsibility for the care of missions previously supported by the church in Europe.

Through special appeals, Lutherans in America contributed approximately $600,000, in the latter part of 1940 and the first half of 1941, for the care of distressed missions abroad and for church ministry to soldiers and sailors called to the service of their country. At the same time contributions for the support of the regular program of the church grew, and the membership was substantially increased.

The general statistics for 1940, released about the middle of 1941, for the U.S.A. and Canada (European and mission statistics not available), show a total of 13,399 ordained ministers, 18,921 congregations, 5,347,783 baptized members and 3,685,625 confirmed members.

During 1941 extensive plans were developed for celebrations of two historic anniversaries in 1942. One of these is the celebration of the 200th anniversary of the landing of Henry Melchior Muhlenberg in America. Muhlenberg is regarded as the "organizer" of the Lutheran church in America, though he arrived 100 years after the first Lutheran settlements were made. The second celebration is that of the 100th anniversary of the arrival of Carl Frederick Heyer in India, as the first foreign missionary sent out by the Lutherans from America.

Large sums of money were contributed by Lutherans in America, in 1941, for their colleges and theological seminaries. Debts were paid or reduced, new buildings were erected and endowments were increased. (W. H. G.)

Luxembourg. Lying between France, Germany and Belgium, Luxembourg was first created a state by the treaty of London, April 19, 1839. Its ruler after World War I was the Grand Duchess Charlotte. Area, 999 sq.mi.; pop. (1937), 300,732; chief town, Luxembourg (cap., 59,760); language, Luxembourgian (idiomatic) and (officially) French and German; religion, mainly Roman Catholic.

On May 10, 1940, the grand duchess was forced to flee as German troops swept into the country and placed it under military administration. On Aug. 14, 1940, military administration was replaced by an even more oppressive civil rule under Dr. Gustav Simon, German gauleiter of the Treves-Cologne district. German laws, language and taxation were introduced. Use of the terms "grand duchy" and "state of Luxembourg" was forbidden, and Luxembourg was virtually incorporated into the German reich. Its economic resources were systematically exploited for Germany's benefit.

But the population remained stubbornly hostile to the new rulers and continued to be loyal Luxembourgers, true to their democratic traditions and the words of their national song, "We want to remain what we are." (S. B. F.)

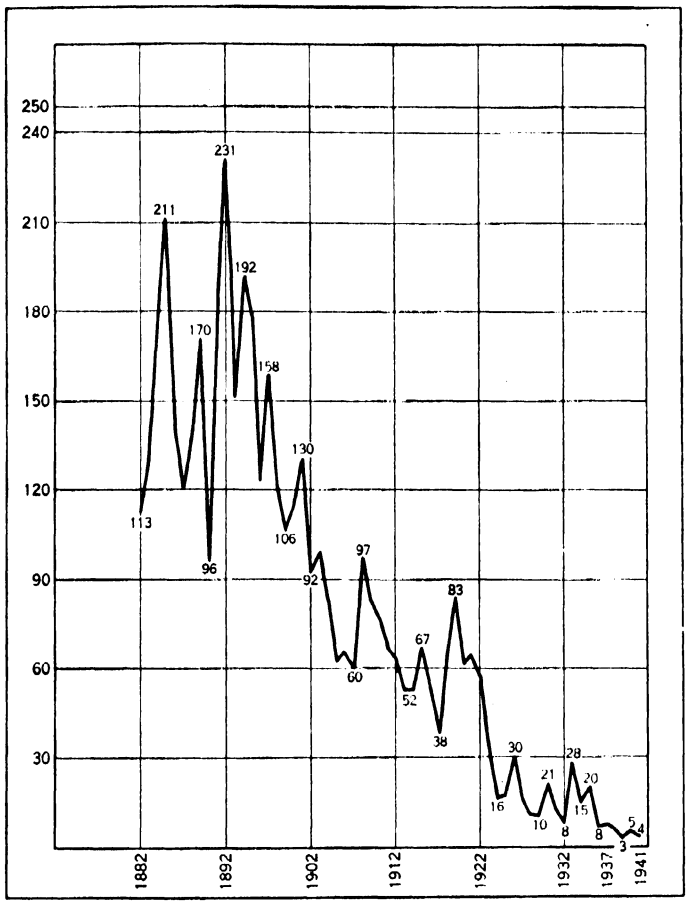
Lynchings. Renewed hope for the elimination of lynching from the American scene was found in the fact that during 1941 this type of crime claimed but four victims, according to the department of records and research of Tuskegee institute. Contrasted with an annual average of 78 victims for the 60 years just ended, the figure for 1941 showed a decrease of 95%; with the high record of 231 victims in 1892, a decrease of 98%. After 1931 the average was ten lynchings per year; after 1936, five per year. The cases reported as lynchings in 1941 were as follows:

Andrews, S.C., Feb. 15: A Negro sawmill worker was killed by head wounds inflicted in a fight between him and a fellow worker and five white youths. The latter were incensed, it is said, because white men had been discharged from the mill and Negroes employed in their places. On order of the coroner's jury the five white men were arrested and tried. Two were convicted of manslaughter and sentenced to seven years' imprisonment; three were acquitted.

Blakely, Ga., May 6: A Negro garage helper, suspected of theft, was taken out of town and beaten into unconsciousness by three white fellow employees. He died six days later. His assailants had not been arrested nor indicted at the end of 1941.

Quincy, Fla., May 13: A Negro youth, charged with assaulting a white girl, was taken from jail by a mob, shot repeatedly and left for dead. Finding him alive a few hours later, the sheriff put him in an ambulance and started him to a hospital. Several men stopped the conveyance, pulled the Negro out and shot him to death. No arrests were made.

Gastonia, N.C., April 13: Four white men, drunk, shouted insults at a Negro man and his wife on the highway. A rock battle ensued, and the white men chased the couple home, where the man's mother fired at them. After dark the four returned. The Negro came out of the house holding a gun and was shot to death. The four assailants were arrested within 24 hours, tried and convicted within ten days and sent to prison for terms of 14 to 25 years.



LYNCHINGS in the U.S. from 1882 to 1941 based on figures given by the department of records and research, Tuskegee institute

There are some who hold that two of these incidents, those in the Carolinas, should be classed as homicides resulting from private brawls, rather than as lynchings. Tuskegee, however, gives them the latter classification under an agreement by interested organizations, which defines lynching as "death illegally at the hands of a group acting under the pretext of service to justice, race or tradition."

Since the tabulating of lynchings was begun in 1882 the record shows a total of 4,699 victims, 83 of them women, 1,300 of them white. Three-fourths of the victims were charged with homicides or lesser offences. Less than one-fourth were accused of assaults on women. Careful investigations have shown that many of the victims were innocent. The southern states lead in the number of lynchings, nine of them with records above 200 victims each. Several states outside the south have had from 40 to 80 lynchings each.

Principal agencies campaigning against lynching are the National Association for the Advancement of Coloured People and the Commission on Interracial Co-operation with its affiliate, the Association of Southern Women for the Prevention of Lynching, which has a signed membership of 43,000 southern white women. (*See* also NEGROES [AMERICAN].)

(R. B. E.)

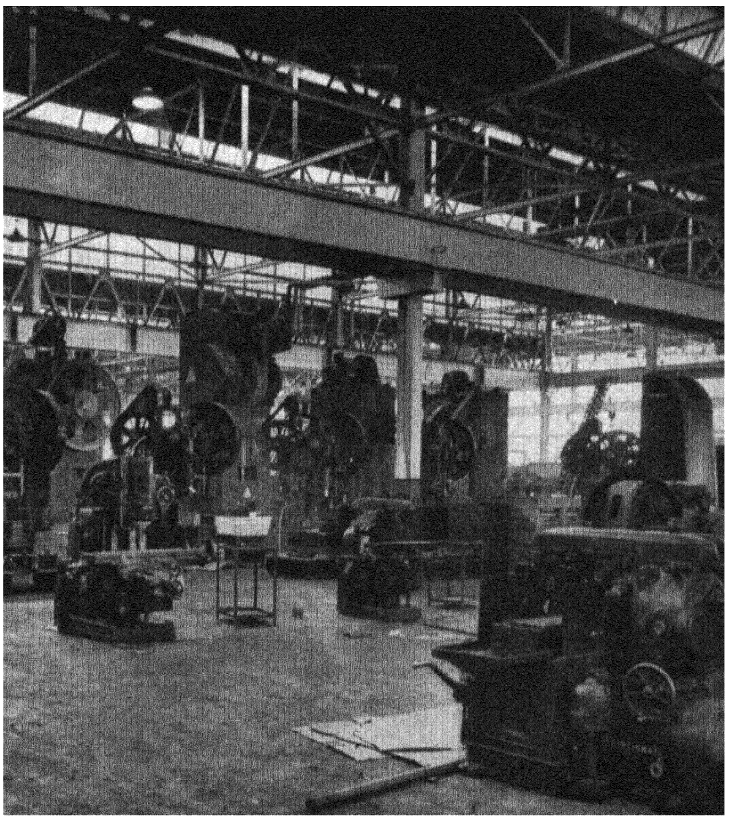
McAdoo, William Gibbs (1863–1941), U.S. lawyer and politician, was born Oct. 31 near Marietta, Ga. From 1939 until the time of his death he was chairman of the board of the American President lines, a government-owned shipping business. He was the author of *Challenge; Liquor and Lawlessness versus Constitutional Government* (1928), and an autobiography *Crowded Years* (1931). McAdoo died in Washington, D.C., Feb. 1. For his earlier career see *Encyclopædia Britannica.*

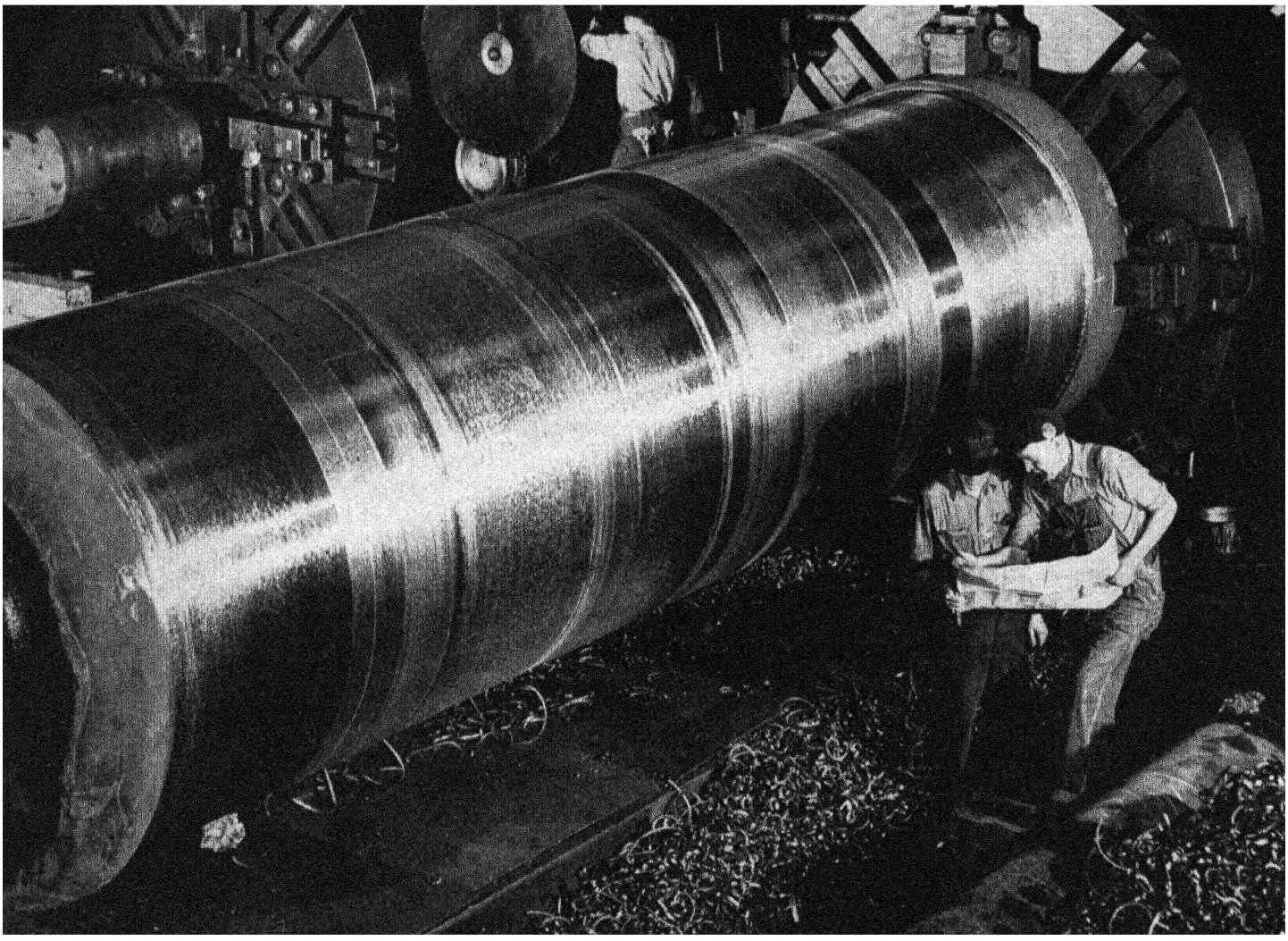
MacArthur, Douglas (1880–), U.S. army officer, was born Jan. 26 in Little Rock barracks, Ark., the son of Lt. Gen. Arthur MacArthur. Graduated as number one man of his class from West Point in 1903, he was commissioned in the engineer corps. He rose from major to brigadier general in World War I. He led the 84th infantry brigade in the St. Mihiel salient, Sept. 1918, and was subsequently made division commander. He was gassed and wounded in action. When made a major general in Jan. 1925, he was youngest of that rank in the U.S. army. He commanded the department of the Philippines, 1928–30. Made chief of staff with rank of full general by President Hoover on Nov. 21, 1930, he reorganized the nation's defenses, enlarged the air corps, doubled the enlisted personnel and initiated mechanization. President Roosevelt retained MacArthur as chief of staff beyond his regular term so that he could complete army reorganization. In Oct. 1935, at the request of President Manuel Quezon of the Philippines, he relinquished his post as chief of staff, became military adviser to the Philippine government and overhauled the commonwealth's defense system. On June 19, 1936, he was appointed field marshal of the Philippine army. He retired Dec. 31, 1937, but Quezon kept him on as head of all Filipino military and constabulary forces. Roosevelt formally nominated MacArthur to be a lieutenant general in command of U.S. and commonwealth forces in the Philippines, after the Philippine army was reincorporated into U.S. forces July 26, 1941. Following Japan's attack on the Philippines he was renamed a full general by President Roosevelt Dec. 19, 1941, and led Filipino and American forces in the defense of the islands.

McCormick, Harold Fowler (1872–1941), U.S. industrialist, was born May 2 in Chicago, the son of Cyrus Hall McCormick, inventor of the reaping machine. After graduation from Princeton in 1895 he went to work in the International Harvester company. In 1918 he became president of the company and in 1935 he was named chairman of the board. McCormick was a member of the board of the Chicago Civic Opera company and from 1934 until his death was honorary chairman of the Chicago Grand Opera company. He endowed the McCormick Institute for Infectious Disease and was a trustee of the University of Chicago and the McCormick Theological seminary. He died in Beverly Hills, Calif., Oct. 16.

Machinery and Machine Tools. Rapidly expanding requirements for production equipment to manufacture ordnance material during 1941 threw a tremendous load on the machine-tool industry. In normal

MACHINE TOOLS in the Chrysler tank arsenal at Detroit, Mich. were in place by April 1941, only seven months after ground was broken for the plant





HUGE LATHE machining the outer breech tube of a 16-in. gun in the ordnance shop of a U.S. steel works

times this industry is surprisingly small; it numbers about 250 companies employing in the neighbourhood of 50,000 men. In the worst depression year orders for machine tools fell off to only about $22,000,000. By 1939, however, Great Britain and France were purchasing large numbers of machine tools, and production for that year reached $200,000,000. The crisis of 1940 initiated a period of growth in the industry which had not reached its peak at the close of 1941. Production of machine tools rose to the unprecedented height of nearly $450,000,000 during 1940, and during 1941, production increased further to an estimated $750,000,000.

Output in 1941 was about 34 times that at the bottom of the depression, and was 7½ times the industry's normal volume. It was 2½ times the volume attained during 1918, when the industrial effort in World War I was at its peak. By the end of 1941 its monthly output was at a rate close to $850,000,000 a year. It was probable that in 1942 the machine-tool builders of America would turn out machines valued at $1,000,000,000 or more.

The industry expanded its output both by adding to its production facilities and by using those facilities more hours each day. New plants were erected, plants were expanded by putting up building extensions, new machine tools were installed and placed in operation within the industry, and many additional men were hired and trained. Practically every company in the industry took on "green" help and trained them as semiskilled operators. Also, the number of hours worked each week was increased. Some plants were working 20 to 24 hours a day with two or three shifts.

Most machine-tool companies also expanded their output by farming out work extensively. Where they had normally built all parts in their own plants, they were in 1941 supplementing their own efforts with the production of plants in other industries. In addition, the machine-tool producers surveyed their plants to discover and put into effect every possible means of increasing production with available facilities. Concentration of production on fewer sizes and types of machines was one of the means employed. The fewer sizes made, the nearer a plant could approach a maximum output. Other factors contributed to larger production: these included better use of floor space, better balancing of production schedules, the use of jigs and fixtures for parts previously made one at a time and improved methods of handling parts and materials through the shop.

Production of machine tools during 1941 naturally was concentrated for the most part on standard sizes and types of machines for which there was the most demand. Nevertheless, a number of new and improved machines were brought out to meet specific needs of the defense industries. In addition, builders of special machine tools found an increasing demand for their product coming from the rapidly expanding aircraft, aircraft engine and similar industries. In the past these industries had been working on a job-lot basis, and could not justify the high-production, single-purpose equipment which in 1941 was such an important factor in increasing production rates in the mass-production industries.

Transfer Machine.—An outstanding example of this type of equipment installed during 1941 was the two-section automatic transfer machine purchased by a new aircraft engine plant for drilling, countersinking, reaming and tapping aluminum cylinder heads. This 80-ft. long machine replaced 40 ordinary machine tools, and yet required only 24 semiskilled operators per three-shift day as compared with 105 highly skilled men needed on the 40 machines replaced. The first unit had 16 stations and performed 25 separate machining operations with 64 tools. The second unit had 53 stations, and 46 operations were performed with 70 tools. A finished cylinder head was turned out every two minutes, as contrasted with the 35 minutes required by ordinary methods.

Broaching, Drilling and Reaming Machines.—Of special importance in the manufacture of ordnance was the development during 1941 of machines and tools for broaching the rifling in gun barrels. Two companies, each working independently, made this equipment available. In one case, 20-mm. Oerlikon cannon could be broached in about 10 min. with solid helical broaches. Four operations, each using a separate broach, were necessary. Each broach had nine splines, six of the spaces between the splines being used as a body to guide the broach, while every third space had an oil channel which served as a passage for lubricating oil which was supplied under pressure.

In addition, a number of deep-hole drilling and reaming machines were made available to speed up production of gun barrels. One interesting machine announced early in 1941 was arranged to do all operations necessary to perform the complete precision chambering of gun barrels to receive the cartridge. In this machine the butt end of a previously drilled, reamed and rifled gun barrel was held at one end of the work spindle by a lever-operated collet chuck. Its outer end was supported in an adjustable lathe-type steadyrest with spring-operated jaws. The turret of the machine contained ten tool spindles, each fitted with a tool adapter, adjustable lengthwise, which acted as a depth stop as the tool was fed into the barrel. After the work spindle had been started, all succeeding operations were controlled by a capstan wheel. As the operator turned the handwheel at the start of the operation, the uppermost spindle, which was in line with the work spindle, fed forward and the first chambering operation was performed. Upon withdrawal of this spindle, the turret indexed to bring the next spindle into line and the second operation was performed. The ten tools working successively completed the chamber.

The drilling and reaming of rifle and machine gun barrels received particular attention during 1941. One six-spindle vertical drilling machine handled either cal. .30 or cal. .50 barrels. Each of the six spindles was provided with individual hydraulic actuation, and each had an automatically actuated three-jaw self-centring chuck for holding the barrel. The revolving barrels were fed down over stationary single-lip drills. For convenience in tool changing, the tool holder was mounted on a slide to accommodate different lengths of drills. Another vertical-spindle machine was arranged for push and pull reaming of the same rifle barrels. On this machine, spindles were grouped in units of four, with each unit independent of the others in action and control. Thus, on the 12-spindle machine three sets of four barrels of different lengths could be reamed at different speeds. Reamers were attached to the spindles either by rigid connections or by quick-acting chucks. Coolant was pumped to the centre of each hollow reamer shank to flush the reamers continually.

Thread Grinding.—Important developments continued to be made in the field of thread grinding. Two companies in 1941 offered fully automatic machines for grinding internal threads, in addition to their standard lines of external thread grinders. One company made internal thread grinders in three models, in all of which the grinding wheel spindle automatically was withdrawn from the grinding position to the wheel-dressing position for automatic dressing of the wheel, and the wheel spindle then was returned to the working position. The amount dressed off the wheel was compensated for automatically. With the machine in gauging position, a safety device locked the grinding wheel spindle to prevent accident to the operator while gauging or changing the work.

Heavy Duty Machine Tools.—Large, heavy duty machine tools were in considerable demand for the manufacture of naval vessels, tanks, heavy gun mounts and similar defense items. In this field a large horizontal boring, drilling and milling machine, announced during the latter part of the year, was of interest. Combination hydraulic-electric control permitted high standards of accuracy, operating convenience and maximum flexibility in application on this machine. The main spindle might be either six or seven in. in diameter, while a smaller 2¼ in. diameter auxiliary spindle was provided for high-speed cutting with small tools. The standard table on this machine measured 60 x 104 in. with 84-in. cross travel. Two oversize models also were available. The same company developed a large planer-type boring, drilling and milling machine with four heads, two on the crossrail and one on each of the side housings. Each headstock could be swivelled 30 deg. in either direction from its normal centre, and each had a 4½-in. diameter spindle in an 11½ in. diameter quill. Power for each spindle was supplied by individual 10-h.p. adjustable speed motors. Interlocking controls permitted starting of the headstock and table drive motors only when the table oil pump and headstock feed motors were running. An overload on any motor would cause automatic shut-down of the machine.

Large marine turbine reduction gears needed to drive naval vessels and auxiliary craft on the ways brought a demand for larger and more accurate hobbing machines. One of the leading suppliers of this type of equipment built several machines having a nominal capacity for gears 120 in. in diameter, with 48 in. face width at 45 deg. and 2½ diametral pitch. With lower helix angles, these machines would accommodate gears up to 160 in. in diameter. Each weighed approximately 138,000 lb. and required a 20 x 30 ft. floor space. Two opposite cutter heads permitted both right- and left-hand portions of double-helical gears to be cut simultaneously, resulting in a substantial increase in production. At any time either head might be disconnected, and the machine operated as a conventional single-head machine. Driving motors and main gear mechanism were placed away from the machine proper to provide thermal isolation. For the same reason, all drive shafts were journalled outside the machine. Tapered roller bearings 54 in. in diameter took the radial table thrust, while flat annular bearings carried the vertical load. Maximum table runout is 0.0003 in. Eleven motors were required to operate the machine.

Gear Shaver.—Shaving continued to increase in importance as a method for finishing gear teeth accurately. One company developed a crossed-axis gear shaver for finishing internal gears to supplement its line of rotary gear finishers for spur and helical gears. This machine finished internal gears through a combination of work rotation, cutter reciprocation and vertical work feed. In contrast to external gear finishers, the machine provided for mounting the cutter on the machine head, while the work was located in a special driving fixture on the knee. This arrangement permitted lateral reciprocation of the cutter through the head drive, while the work was rotated and fed into the cutter. The same company made available a line of gear-finishing machines for crossed-axis shaving gears up to four ft. in diameter and 20-in. face width. Another supplier of similar equipment announced a gear-shaving machine which finishes gears up to 36 in. in diameter, 2 in. pitch, with face widths up to 36 in.

Turning Machine.—One of the few entirely new machines announced during 1941 was the "Rigid-turner" vertical turning machine for high-production turning of multiple-diameter work having straight, tapered or formed sections. Single and eight-spindle machines incorporating this principle were being built for purposes such as turning diameters and tapers on cluster-gear shafts, turning the spherical end on variable-ratio universal joints, and turning the complete contours of shell. Main advantage of the machine was that inexperienced help could be used to operate it. The principle of turning might be described as a disk-type form cutter rolling along the work piece, which was rotated and fed vertically past the tool. Accurate layout of the cam and cutter permitted accurate starting of the cut, cutting of straight and tapered sections of exact length, generation of square-cut shoulders and chamfering. For shell turning, the rotary machine with a different type of head and a carbide tool was used. This head was operated from a cam which had the shape of the shell to be turned. The single tool turned the length of the shell, keeping the number of adjustments to a minimum. On 75-mm. shell, these machines averaged 185 pieces per hour over an eight-hour day.

Shell Machines.—Large requirements for shell-turning equipment brought about the development of a number of special automatic shell machines, in addition to the arrangement of a number of standard multiple-tool lathes for shell operations. During the year, the defense committee of the National Machine Tool Builders association, at the suggestion of army ordnance officers, developed a line of special machines for making shell. Designs of these machines were such that they could be built quickly in any well-equipped machine shop.

Also, a manufacturer of welding machines took over the manufacture of a British-developed shell-turning lathe of somewhat unusual type. Many new features were embodied in the design of this lathe. The tool boxes were supported from an overhead bridge to permit chips to fall clear. A conveyor loaded and unloaded the shell without being lifted by the operator. Production on this machine for large shell was high, as from 18 to 20 British 5½-in. shell, 27 in. long, could be rough turned per hour by unskilled operators. (B. C. B.)

Mackenzie King, William Lyon: *see* KING, WILLIAM LYON MACKENZIE.

McLean, Edward Beale (1883–1941), U.S. publisher, was born in Washington, D.C. Heir to an immense fortune, he was educated by private tutors. Young McLean made news in 1911 when he bought the famous Hope diamond for his wife at a cost of $300,000. In 1916 he again made news with his efforts to break his father's will and gain direct control of the McLean estate, then estimated at $25,000,000. McLean, who controlled the *Washington Post* and the *Cincinnati Enquirer*, became a power in the inner councils of the Republican party and was a close friend of President Harding and his secretary of interior, Albert B. Fall. Called to testify before the senate committee investigating the Teapot Dome scandal, McLean revealed that in 1921 he had made a loan—without security—of $100,000 to Fall. In 1933 McLean was declared legally insane and incapable of managing his estate. He died in Baltimore, Md., July 27.

McNamara, James B. (1881?–1941), U.S. labour agent, was sentenced to life imprisonment in 1911 for bombing the *Los Angeles Times* building in which 21 persons were killed. Defended by the late Clarence Darrow and supported in his protests of innocence by leading liberals, McNamara at first maintained that he was being "persecuted" to discredit the labour movement. He later confessed, however, declaring his motive for placing a time-bomb in the building was to demonstrate against what he regarded as the paper's "unfair" labour policies. Public reaction to the bombing was so strong that the *Times* won its campaign against closed shops. He died in prison in San Quentin, Calif., March 8.

McNaughton, Andrew George Latta (1887–), Canadian army officer, was born at Moosomin (Sask.) Feb. 25, the son of Robert Duncan and Christina Mary Anne (Armour); he was educated at Moosomin public school, Bishop's college school, Lennoxville, P.Q., and at McGill university (1906–10), B.Sc., 1910, M.Sc.

1912, Senior demonstrator in electrical engineering (1912–14). General McNaughton served conspicuously in World War I, during which he commanded in succession the 4th battery, 2nd brigade, Canadian field artillery; the 21st howitzer battery; the 11th brigade C.F.A.; and next was appointed counter-battery staff officer of the Canadian corps. Wounded at the second battle of Ypres (April 1915) and again at Soissons (Feb. 1918), he was three times mentioned in dispatches, awarded the Distinguished Service Order (1917) and made a Companion of the Order of St. Michael and St. George (1919).

Upon returning to Canada in May 1919, General McNaughton was appointed member of the committee for the reorganization of military forces of Canada, and in 1922 he was promoted to deputy chief of the Canadian general staff. In 1929 General McNaughton was again promoted, this time to chief of the general staff, a position which he held until asked to be president of the Canadian National Research council (1935).

He served in this capacity until Oct. 6, 1939, when he was appointed commander of the Canadian active service forces. As head of the National Research council, in addition to contributing numerous papers to technical journals, he particularly directed research in electrical and aeronautical investigations, and was joint inventor with W. A. Steel of the cathode-ray direction finder. At the close of the year (1941) General McNaughton was "somewhere in England" with the First Canadian Army corps.

(J. T. C.)

Madagascar: *see* FRENCH COLONIAL EMPIRE.

Magazines and Periodicals: *see* NEWSPAPERS AND MAGAZINES.

Magnesite. The known prewar output of magnesite was about 1,350,000 metric tons, excluding Russian production, on which there was no accurate information. Of this total the axis powers had within their own original borders only about 5%, but controlled by forcible annexation and occupation at least 86% of the total; of the remainder 3% was in British territory and 13% in the United States.

To offset the shortage due to the inability to import Austrian magnesite, the United States production had been heavily increased, amounting to 333,166 short tons in 1940, as compared with 187,660 tons in 1929 and 316,838 tons for the former wartime peak in 1917. Of the 1940 output of crude, 2,133 tons was sold as crude, 16,261 tons as caustic calcined and 140,668 tons as dead-burned.

Imports in 1940 were 30,951 tons, most of which was from the Japanese area of Kwantung. No serious difficulty was anticipated in maintaining the necessary supplies to meet current needs in the United States, but no information was available as to conditions in other countries. (G. A. Ro.)

Magnesium. There has been an enormous expansion in the demand for magnesium for light alloys and for incendiary bombs. The 1940 output of metal increased by 87% over 1939, to 6,261 short tons. This was all by one producer, but others entered the field in 1941, and what the total for 1941 might be was largely dependent on when the plants were put into operation, and the output that could be worked up in the remainder of the year.

From such data as were available in 1941 it seemed fairly certain that a doubling of the 1940 total could be made, and that a trebling might not be impossible.

Still further additions to output were under way, and by early in 1942 the production rate was expected to be at least six times that of 1940, and the 1941 output should not be much if any less than the world total for 1940.

An unofficial estimate of production in 1940 included 19,000 metric tons from Germany, 6,500 tons from Great Britain, 5,680 tons from the United States, 4,000 tons from Japan, 2,000 tons from France, 1,500 tons from U.S.S.R., 700 tons from Switzerland, and 500 tons from Italy, a total of 39,900 tons, with nearly every country on the list planning for increased output. (*See* also METALLURGY.) (G. A. Ro.)

Mahmud, Mohammed Pasha (1882–1941), Egyptian politician, was born in Upper Egypt. A graduate of Oxford, he entered the Egyptian government service, soon won the rank of pasha and the post of deputy governor, and became a leader of the nationalist movement. In 1919 he was exiled to Malta for his anti-British activities, but was given permission to go to Paris where he appealed to Woodrow Wilson to help Egypt win her freedom. After failing to sway the U.S. president he went to the United States to enlist sympathy for the nationalist cause, but was again unsuccessful. On his return to Egypt he helped organize the Liberal Constitution party and became its leader and president. He became premier in 1928 and dropped his extremist views. When King Farouk called on him in Dec. 1937 to form a cabinet, it was for the purpose of disbanding the Blueshirts, a nationalist party made up of Egyptian youth. Mahmud Pasha resigned in 1939 because of ill health, but was called back in the war days of 1940 to the post of defense minister. He died in Cairo, Feb. 1.

Mail-Order Business: *see* BUSINESS REVIEW: *Retail and Wholesale Trade.*

Maine. The extreme northeastern state of the United States, admitted as a state in 1820 and popularly known as the "Pine Tree state." Area 33,215 sq.mi.; pop. (1940) 847,226. Rural dwellers numbered 504,169, while 343,057 were classed as urban. The capital is Augusta (19,360). The largest cities are Portland (73,643); Lewiston (38,598); Bangor (29,822).

History.—The state legislature met in Jan. 1941 for its regular biennial session and adjourned in April. The house had 151 members, the senate, 33. Among controversial measures enacted were a premarital examination law, a contributory pension bill covering state employees, and a cigarette tax bill the returns of which were earmarked for old-age assistance. Various tax rates were increased, including a half-cent-a-gallon rise on gasoline. The gas-tax increase was defeated in a referendum election, and the governor vetoed the pension bill because the legislature failed to enact tax measures to finance the state pension fund. The governor and his finance officers made changes in budgeting, accounting, and auditing procedures of the state, designed to improve efficiency and prevent financial scandals such as had occurred during the preceding administration. The permanent investigating committee established by an act of the 1940 special session published its first report on administrative conditions in the state government. The governor charged the liquor commission with inefficient and lax administration of the laws, and replaced all three members, with his former secretary as chairman. Many state employees resigned during the year to accept better-paid positions in war industries or other private employment. Governor Sewall of Bath was expected to be a candidate for renomination in the June (1942) primaries for the 1943–44 term. Senator Brewster took office in January for his six-year term.

Education.—Colby college carried on construction of several buildings on its new campus on "Mayflower Hill." The University of Maine started a library building. Maine's three colleges and the state university considered an accelerated (three-year) program as a war move, but no definite plans were made. There were 1,989 students enrolled at the University of Maine in Sept. 1941, and the teaching staff numbered 181.

Finance.—The state budget for 1939–40 through 1941–42 was as fol-

lows: actual, 1939–40: receipts $43,822,761; expenditures $43,462,343; estimated, 1940–41: receipts $41,243,284; expenditures $41,208,277; estimated, 1941–42: receipts $41,343,796; expenditures $41,342,496. The gross debt on May 31, 1941 was $28,205,500.

Agriculture.—One of the driest seasons in history in the southern and central portions of Maine affected hay, apples and other crops. Wells and springs went dry, forcing farmers to haul water for livestock, and at the end of the year streams and lakes were still below normal levels. Maine's potato crop for 1941 was estimated at 44,745,000 bu. as compared with 41,762,000 bu. for 1940. The average Maine price per bushel for the 1940 crop was 34 cents; reports through December showed a 64-cent average for the 1941 crop.

Table I.—*Leading Agricultural Products of Maine, 1941 and 1940*

Crop	1941 (estimate)	1940
Corn, bu.	697,000	663,000
Wheat, bu.	36,000	42,000
Oats, bu.	3,996,000	4,160,000
Barley, bu.	135,000	116,000
Buckwheat, bu.	105,000	91,000
Hay, tons	650,000	770,000
Potatoes, bu.	44,745,000	41,762,000
Apples, bu.	787,000	752,000
Beans, tons (dry)	5,150	3,850

Manufacturing. The total value of manufactures (1939 census) was $345,368,595. Total employment was 81,995, and wages paid, $82,026,503.

Table II.—*Principal Industries of Maine, 1939 and 1937*

Industry	Value of Products	
	1939	1937
Boot and shoe	$46,162,403	$42,568,005
Cotton mill	28,342,860	28,037,430
Woollen mill	36,118,681	28,109,949
Pulp and paper	25,370,932	28,890,516

During 1941 there was an exodus of skilled and semiskilled labour from the rural areas to shipyards and industries of Maine, and from Maine in general to industrial centres in other states. Maine shipbuilding revived and spread along the coast; paper, cloth, and shoe mills were on full-time schedules of defense work. The composite business index for the state rose to 21.3% higher in Nov. 1941 than in Nov. 1940. The 1941 tourist business was estimated at $108,000,000, $10,000,000 more than the 1940 figure.

Mineral Production.—The total value of minerals produced in Maine in 1939 was $3,769,671, as compared with $3,548,638 in 1938.

Table III.—*Principal Mineral Products of Maine, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Stone	$1,228,930	$1,161,535
Sand and gravel	888,646	968,766
Clay	371,629	210,814

(E. F. D.)

Maize: *see* CORN.

Malaya, British: *see* FEDERATED MALAY STATES; STRAITS SETTLEMENTS; UNFEDERATED MALAY STATES.

Mallory, Clifford D. (1881–1941), U.S. shipping executive, was born May 26 in Brooklyn, N.Y. At 19 he became a clerk in the Mallory shipping firm, which his great-grandfather founded with a fleet of clipper ships. Except for a two-year interval, 1917–19, when he served as assistant director of operations of the U.S. shipping board, he remained with the firm continuously. In 1919 he was named president of C. D. Mallory & Co., and later headed several other shipping companies. Mallory died in Miami Beach, Fla., April 7.

Mallory, Frank Burr (1862–1941), U.S. pathologist, was born Nov. 12 in Cleveland, O. After receiving his M.D. from Harvard medical school in 1890, he studied pathology at Prague and Freiburg, Germany. In 1903 Dr. Mallory isolated the scarlet fever bacillus and a year later he published his discovery of "protozoonlike" bodies in the epidermal cells. He discovered the cause of cirrhosis of the liver and also developed new methods for treatment of whooping-cough. He was connected with the Institute of Pathology at the Boston City hospital from 1891 to 1932. Dr. Mallory was an organizer of the American Association for Cancer Research and in 1935 was awarded a medal by the Association of American Physicians for outstanding work in pathology. He was co-author of *Pathological Technique* (1897) and wrote *The Principles of Pathologic Histology* (1914). Dr. Mallory died in Brookline, Mass., Sept. 27.

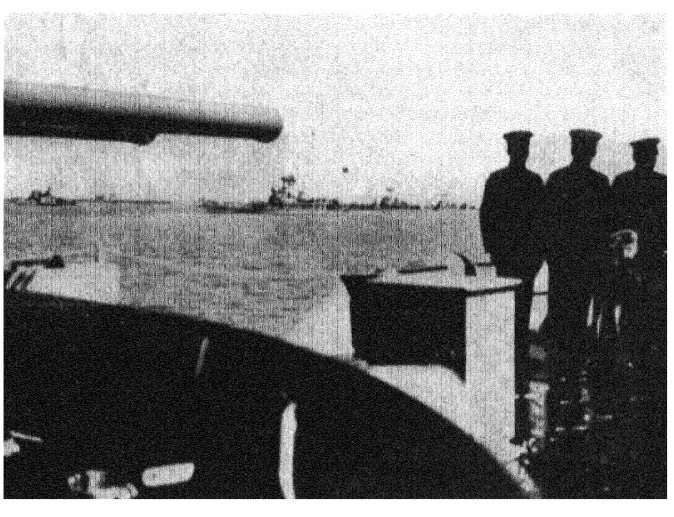
Malta: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Manchoukuo (MANCHURIA). An empire, practically a dependent state of Japan, located in northeastern Asia, bounded on the north and east by Soviet Siberia, on the west by Siberia, Outer Mongolia and China proper, on the southeast by Chosen. Its main outlet to the outside world is through the Kwantung leased territory, with its large port of Dairen, which is directly administered by Japan. The capital is Hsinking (formerly Changchun); the emperor is Kangte. Area, approx. 548,000 sq.mi.; pop. (1939), 39,454,000, including 642,300 Japanese and 1,162,100 Chosenese. The largest cities are Mukden (863,515), Harbin (517,127), Hsinking (415,264), Antung (220,587).

History.—Manchoukuo was formerly divided into the three northeastern provinces of China, Fengtien, Kirin and Heilungkiang. It was not closely integrated with the Chinese state and its rulers, Chang Tso-lin (1916–1928) and his son, Chang Hsueh-liang (1928–1931), administered it as a virtually independent principality, with little reference to the Chinese central government. Both the U.S.S.R. and Japan possessed extensive administrative and preferential commercial rights in Manchuria in connection with their operation of the region's most important railways, the Russian-owned Chinese Eastern railway and the Japanese-owned South Manchuria railway. Russian rights lapsed during the years of revolution and civil war; but a new agreement for joint Soviet-Chinese operation of the Chinese Eastern railway was negotiated in 1924 and remained in effect until the soviet government sold its interest in the railway to Manchoukuo in 1935.

Disputes over various political and economic questions preceded the action of the Japanese army in seizing Mukden, seat of Chang Hsueh-liang's administration, on Sept. 18, 1931, and then extending its occupation to the whole country. A committee of Manchurians who were willing to accept Japanese domination proclaimed the independent state of Manchoukuo Feb. 18, 1932. Henry Pu Yi, a scion of the old Chinese Manchu dynasty, was inaugurated as chief executive of the new state on March 9; he was proclaimed emperor, assuming the name of Kangte, on March 1, 1934.

There are no representative institutions in Manchoukuo, and there is a firm Japanese control of the governing bureaucracy,



JAPANESE-MANCHOUKUOAN GUNBOATS maintained a vigilant patrol of the Amur river, along the Russian border, after Germany invaded the U.S.S.R. in 1941

largely achieved through the powerful general affairs bureau. While the ministers are usually natives of Manchoukuo, real authority rests with Japanese vice-ministers. The commander in chief of the Kwantung army, the Japanese force in occupation of the country, is also the ambassador of Japan to Manchoukuo; this army plays an important part in shaping the development of the country. For some years Japan and the Central American republic of El Salvador were the only foreign powers which recognized Manchoukuo diplomatically. As Japan became more closely associated with the Berlin-Rome axis, Germany, Italy and the countries which were associated with them politically extended recognition to Manchoukuo, and Manchoukuo associated itself with the anti-Comintern pact and followed Japan's lead in declaring war on the United States and Great Britain in Dec. 1941.

Education and Religion.—Manchoukuo in 1939 possessed 15,877 primary schools, with 1,589,169 students. There were 238 middle schools, with 54,768 students, 40 normal schools, with about 8,000 students, and 13 institutions for higher education, with 3,820 students. Manchoukuo's expenditure on education in the fiscal year 1939 was 45,967,000 yuan. The principal religions, in the order of numbers of adherents, are Buddhism, Taoism, Lamaism, Mohammedanism and Christianity. There are about 130,000 Roman Catholics and 125,000 followers of other branches of the Christian faith in Manchoukuo.

Defense.—The Manchoukuoan army was originally recruited on a volunteer basis, with a strength estimated at 80,000 to 100,000. In numbers, and still more in equipment and political reliability, it was inferior to the Japanese Kwantung army. An imperial ordinance of April 15, 1940, established conscription and a three-year term of compulsory military service. There were ten army headquarters in 1941, located in the principal cities of the country, with a river defense headquarters in Harbin, to take charge of the flotilla of gunboats and patrol vessels on the Amur and Sungari rivers. Between 1934 and 1939 five military schools were established, two in Hsinking, one in Mukden, one in Harbin and one in Wangyehmiao, in the Hsingan province.

Finance and Banking.—The Manchoukuoan yuan is equivalent in value to the Japanese yen, which was pegged at 23.48 cents. The budget for the fiscal year 1940 (which coincides with the calendar year) was 573,550,000 yuan, as against 403,377,000 yuan in 1939. The two most important banks in 1941 were the Central bank of Manchou, which controls the note issue, and the Industrial bank of Manchou.

Trade and Communication.—Like Japan, Manchoukuo ceased publishing statistics of foreign trade in the autumn of 1940. For the first nine months of 1940, exports were 544,629,000 yuan; imports were 1,397,715,000 yuan. These figures showed a continuance of the trend of the preceding years, when a series of heavy unfavourable trade balances indicated a pouring of Japanese resources into Manchoukuo for purposes of industrial and military development. Manchoukuo had 11,067,900 km. of railway lines in Oct. 1939. About 8,000 mi. of national highways were constructed at a cost of 50,636,766 yuan between 1932 and 1938.

Agriculture, Resources, Manufactures.—Manchoukuo's staple crop is the soybean, which is used for a great variety of food and industrial purposes. The annual production of this grain has been steady at about 4,000,000 tons. Manchoukuo's other principal crops in 1939 were kaoliang (4,570,000 tons), millet (3,530,000 tons), corn (2,470,000 tons), wheat (940,000 tons), rice (700,000 tons). The output of rice increased considerably because of the inflow of Chosenese farmers who are skilled in the use of irrigation. Manchoukuo has large forest areas in its northern provinces and considerable reserves of coal and iron, although the last is of low quality.

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(W. H. CH.)

Mandated Pacific Islands: *see* PACIFIC ISLANDS, MANDATED.

Mandates. Owing to the war it was not found possible for the Mandates commission to meet in 1941. But the

Mandated Territories

Territory	Area	Date of Mandate	Mandatory Power	Former Title	Former Administration
South-west Africa, including Caprivi Zipfel, formerly part of Bechuanaland protectorate	317,725 sq.mi.	Dec. 17, 1920	Union of South Africa	German South-west Africa	German Empire
Togo, comprising: (1) Togoland, i.e. western section, excluding the seaboard	13,040 sq.mi.	July 20, 1922	Great Britain	Togo	German Empire
(2) Togo, i.e. eastern section and seaboard	20,000 sq.mi.		France		
Cameroons, comprising: (1) Cameroons adjoining Nigeria	34,081 sq.mi.	July 20, 1922	Great Britain	Kamerun	German Empire
(2) Cameroons adjoining French Equatorial Africa	161,200 sq.mi.		France		
Tanganyika	360,000 sq.mi.	July 20, 1922	Great Britain	German East Africa	German Empire
Ruanda-Urundi	21,200 sq.mi.		Belgium		
Palestine	10,100 sq.mi.	Sept. 29, 1923	Great Britain	Palestine	Ottoman Empire
Trans-Jordan	34,000 sq.mi.		Great Britain	Part of the Wilayat of Syria	
Syria and Lebanon	77,700 sq.mi.		France	Syria	
New Guinea, Territory of, comprising: (1) North-eastern New Guinea (i.e. the northern section of south-east New Guinea) (2) Bismarck Archipelago (New Britain, New Ireland, the Admiralty Isles, etc.) (3) Certain of the Solomon Islands (Bougainville, Buka, etc.)	93,000 sq.mi.	Dec. 17, 1920	Commonwealth of Australia	Kaiser Wilhelm's Land Bismarck Archipelago German Solomon Islands	German Empire
Western Samoa, comprising Savaii, Upolu, etc.	1,133 sq.mi.	Dec. 17, 1920	New Zealand	German Samoan Islands	German Empire
Nauru	8 sq.mi.	Dec. 17, 1920	British Empire, as represented by Great Britain, Australia, and New Zealand	Nauru	German Empire
Pacific Islands North of the Equator, comprising: (1) Marianne or Ladrone Islands (except Guam) (2) Caroline Islands, comprising the Eastern Carolines and Western Carolines, together with Yap Island and Pelew (3) Marshall Islands	811 sq.mi.	Dec. 17, 1920	Japan	No change	German Empire

mandates section of the secretariat at Geneva still received and distributed the annual reports of the mandatory powers to the members of the Mandates commission. It continued the classification and study of other documentary material concerning mandated territories. There was no question but that the exceptionally full documentary evidence at the disposal of the League secretariat, bearing on every aspect of the mandates system as well as upon many general colonial problems, would be found of the utmost value at the close of the war, when statesmen would be called upon to provide just and satisfactory solutions of these far-reaching, controversial questions. (M. FE.)

Manganese. Such limited information as had become available on world manganese production is condensed into the accompanying table.

World Production of Manganese Ore
(In thousands of metric tons)

	1929	1937	1938	1939	1940
Brazil	316	253	222	193	119
Cuba	1	131	124	102	120
Egypt	191	186	153	120	?
Gold Coast	415	536	329	342	?
India	1,010	1,068	983	950?	?
South Africa	9	631	552	420	412
U.S.S.R.	1,415	2,752	2,273	?	?
Others	482	483	472	450?	?
Totals	3,840	6,040	5,100	4,700?	?

Production of high grade manganese ores in the United States in 1940 was only 40,123 long tons. By midyear of 1941 new plant construction for increasing the output was being put into operation, and by November production had increased to 12,700 tons monthly, which is still a comparatively low figure considering the magnitude to which domestic production was pushed during World War I.

Total shipments for 1941 would not be much if any more than 75,000 tons.

Imports into the United States had been heavy, amounting to 1,294,278 long tons in 1940 (general imports), and at a rate during the first three quarters of 1941 equivalent to 1,135,000 tons for the year. Trade statistics indicated that receipts from Brazil, India, South Africa and various minor sources had been at a rate in excess of that needed for immediate consumption, and that surplus had been accumulating in bonded warehouses.

Receipts from the Gold Coast fell below consumption demands during 1940, and had practically disappeared since early in 1941; it was understood that most of the Gold Coast ore was sent to England after the Mediterranean had been closed to traffic from India. This also stopped shipment of Russian ore, of which no shipments had been received after about midyear of 1940, and it was believed that by the end of 1941 practically all of the stock in bond had been used.

The action of Japan in forcing the United States into the war in the Pacific area was expected to have considerable effect on the manganese supply.

In the first place, imports from the Philippines, which amounted to 45,000 tons in the first three quarters of 1941, were not expected to be possible, and smaller amounts from the Netherlands East Indies would also be cut off. Furthermore, any appreciable extension of Japanese naval activities was likely to have an adverse effect on Indian shipments.

Little was known of operations in 1941. Shipments from Cuba and Brazil increased, while production in South Africa in the first half of the year was 245,019 short tons, an increase of 16% over the same period of 1940, but exports declined to 151,423 tons. (*See* also METALLURGY.) (G. A. RO.)

Manitoba. A midcontinent province of Canada, the oldest and most easterly prairie province. Area, 246,512 sq.mi. (26,789 sq.mi. water); pop. (1941 Canadian census) 722,447; urban 44%. The 1936 census indicated the following racial origins of the population: British, 362,389; Ukrainian, 86,982; German, 52,450; French, 47,683; Polish, 35,136; Scandinavian, 31,504; Dutch, 25,521; others, 66,210. Total Canadian-born, 70%. Capital, Winnipeg; pop. (1941 census) 217,994.

History.—The unicameral legislature consisted of 55 members in 1941, with a coalition government representing the Liberal-Progressive, Conservative, Co-operative Commonwealth Federation and Social Credit parties, headed by John Bracken, premier since 1922. The lieutenant governor in 1941 was R. F. McWilliams. Representation in the dominion house of commons consisted of 17 and in the senate of 6 members.

Education.—Public, elementary and secondary schools are maintained by general taxation. Manitoba university, including a faculty of agriculture and an adult education division, and affiliated colleges in Winnipeg, St. Boniface and Brandon, provides for higher education. Pupils in elementary grades in 1941 numbered 111,932; in secondary, 22,411. Full-time students enrolled in the university 2,564; total registration, 4,116.

Banking and Finance.—Winnipeg, financial centre of western Canada, is western headquarters of 8 of the 12 Canadian banks, and of insurance, mortgage and financial institutions.

Agriculture.—The Manitoba Farmers' federation, a consolidation of all nongovernment agricultural organizations, continued its rural adult education program in 1941. A peak in the trend from a cereal to a mixed agricultural and industrial economy was evidenced during the year. The total gross value of agricultural production in 1940 was $101,368,000.

Communication.—In 1941: Canadian Pacific railway (Manitoba district) total mileage, 3,494; Canadian National railway, 3,061; Hudson Bay railway, 510; Midland railway, 75; Greater Winnipeg water district, 110. Highways in 1941: surfaced, including trans-Canada, 8,756 mi. (gravelled, 8,209; bituminous, 510; concrete, 37). The government-owned telephone system had 79,613 telephones, 129 exchanges and a total wire mileage of 315,924; it operated two radio stations in 1941, one of 15,000 watts at Winnipeg and one of 1,000 watts at Brandon. There was one privately owned radio station of 1,000 watts at Winnipeg and two short-wave transmitters operated in conjunction with it.

Manufacturing and Other Production.—Manufactures (1939) were valued at $134,293,595; minerals (1939), $17,137,930; fisheries, $2,754,254; furs (1940): wild catch, $2,036,728; farms, $847,227; processed in Winnipeg, $821,343; processed in and exported from Manitoba, including furs from other provinces, $6,935,216. A government program of muskrat development, game preserve and trapline regulation achieved success. (J. L. J.)

Mann, Tom (1856–1941), British labour leader, was born April 15 at Foleshill in Warwickshire, Eng. When he was nine, Tom Mann worked as a farmhand; at 11 he laboured in coal pits. He was then apprenticed to a toolmaker and later became a journeyman engineer. In 1885 he joined the Socialist movement.

Showing a flair for leadership, he helped stage a great dock strike in 1889. By 1900 he had led 150 strikes involving 250,000 workers.

Among his works were *A Socialist's View of Religion, Tom Mann's Memoirs* and *What I Saw in China, 1927*. He died in Grassington, Yorkshire, Eng., March 13.

Maple Products. Production of maple syrup and sugar, and the number of trees tapped in the United States in 1941, in 1940 and the ten-year (1930–39) aver-

Maple Syrup and Sugar Production and Trees Tapped in U.S. and Leading States

State	Syrup, gal.			Sugar, lb.		
	1941	1940	1930–39	1941	1940	1930–39
United States	2,053,000	2,628,000	2,642,000	554,000	629,000	1,377,000
Vermont	814,000	1,080,000	1,030,000	275,000	268,000	700,000
New York	570,000	734,000	733,000	165,000	212,000	340,000
Ohio	323,000	332,000	341,000	8,000	11,000	27,000

Number of trees tapped

State	1941	1940	1930–39
United States	10,081,000	10,178,000	11,974,000
Vermont	4,242,000	4,242,000	5,299,000
New York	2,035,000	2,867,000	3,199,000
Ohio	1,087,000	1,144,000	1,199,000

ages were reported by the department of agriculture as shown in the table on page 413. (S. O. R.)

Marble: *see* STONE.

Marchand, Jean (1883–1941), French painter, was born Nov. 22 in Paris. He illustrated the works of Paul Valéry and Paul Claudel and painted the fresco "La Musique" in the Palais de Challot. His works hang in the Luxembourg museum, the Albertina museum of Vienna, the National gallery of London and the Imperial museum of Japan. Word of his death in Paris reached Vichy, Oct. 10. (See *Encyclopædia Britannica.*)

Marine Biology. Russia was brought into the European conflict in June and so far as can be known its long-range marine programs along the Murmansk and the Black sea ports were abandoned. This event intensified the deadlock on marine research in all European waters. However, in the western hemisphere some progress was made to keep the science active. The development of automatic depth recorders and accurate methods of position finding at sea[1] contributed an important addition to the knowledge of subterranean topography especially about the shores of the North and South Americas in both Atlantic and Pacific oceans. From echo soundings it can be concluded that the topography under the sea is quite like the configurations we are familiar with above sea level. The sub-surface continental slopes in locations where studied, show signs of erosion—submarine mountains are weathered (not mountains of deposition). These submarine slopes, it is estimated, date back to the Pleistocene or ice age. Evidences pointed clearly to the fact that the sea level at one time was at least 10,000 feet lower than at the present.

Another aspect of the physical topography of the ocean bottom[2] concerns the ages of its deposits. This has been approached by workers at the Carnegie Institute of Washington where an investigator has designed a device which can be shot into the mud to any required depth and tube-core samples obtained which subsequently can be studied by a new technique involving the determination of the amount of radium in the mud. From this index, the age of the mud can be accurately estimated. It has been deduced by this method that approximately 1,000,000 years are required to deposit 10 feet of ocean mud.

On the biological side, not even the ocean floor is hidden from the candid camera's[3] eye. In a new technique for deep sea study, a camera with its flash bulb can be sent down to any desired depth, where it can obtain snapshots of areas of between two and one-half and three and one-half feet in size. In the hands of a skilful operator at the Oceanographic institute at Woods Hole, Mass., photographs were taken from relatively shallow shores to half a mile below sea level. Over the Georges Banks fishing grounds along the New England coast, such exposures show crabs, sea snails, starfish, sea urchins, sand dollars, deep sea scallops, tube-building worms and sponges. While great profusion of animal life abounds at these depths, the photographs show no signs of plant life of any kind. These facts imply that the basic organic synthesis is largely performed by the pelagic phytoplankton—perhaps the diatomes standing first in rank. These are then postulated to be followed by zooplankton, especially the copopods which constitute the chief item in the dietary of our food fishes.

In spite of the effort to process all sorts of other fats and oils, whale oil[4] and all the complex factors involved in its extraction held its place in fixing the price structure for all the other fats. While this commodity totalled only about 10% of the world trade in fats, it constituted about 54% of the margarine and lard compounds in Germany, and contributed about 40% of the margarine and 28% of the lard compounds within the United Kingdom. With other fats being allocated to war purposes, new uses of whale oil as food and for industrial processes were rapidly being found.

While extensive damage was done to the Marine Biological laboratory at Plymouth[5] during the earlier months of the year, emergency repairs to the station were effected so that research might be continued although the greater part of the library was of necessity moved to other quarters. Limited use of the motor boats for work at sea also was renewed.

At the Bermuda Biological station[6] the buildings and grounds were leased to the United States government to be used as a temporary hospital, and the books, scientific equipment and supplies were stored in St. George. However, the government aquarium at Flatts with its limited laboratory facilities were made available for continued research on certain problems, and it was proposed by the trustees that temporary buildings be provided for research workers.

In an attempt to learn the habits, breeding places and breeding behaviour of certain game fishes (marlins, swordfish, etc.) the sixth Michael Lerner, American Museum Big Game Fish expedition[7] left Miami, Fla., early in January, for Talara, Peru. From this base near the Ecuadorian border off-shore fishing excursions were to explore the fish populations in the rip, where the warm El Nimo enters the colder Humboldt current. It is within these waters that the swordfish, manta sharks and whales are found feeding on the smaller fish of these two currents. It was hoped that data gathered might materially supplement that already at hand on these forms taken in successive expeditions since 1936, from the North Atlantic, the Bahamas, Australia and New Zealand. It was reported also a study would be made on the large squid which gather in enormous numbers on the surface waters at night. Live specimens were to be shipped back to New York for scientific study at the museum.

Another chapter in ontogeny written by nature, was translated in its essence by a scientist of the Eastern Pacific Zaca expedition of the New York Zoological society[8] concerning the young sailfish (*Istiophorus grey*). While in outward appearance the young resemble somewhat the adult, the internal anatomy belies the extensive changes that are to come. There is no suggestion in the young of replacement of scales with bony scutes; that sharp strong dermal denticles will replace the teeth; that the skull will be moulded into a prehensible snout; that the pliant body will be stiffened at all the joints to become a tense spring, an organic engine to generate power for terrific ramming.

Data gathered on the United States Antarctic expedition[9] it was reported would soon appear in published form. Reports are expected to include the aurora, ice formations, geology, ornithology, radio reception and weather conditions. New details were added to the map of Antarctica by field and aeroplane photos; four new areas of internal disturbance, and 15 new bay inlets were photographed over 400 miles of ice barrier. Gaps in Antarctic mountain chains were filled and the absence of sea level connections between Ross and Wedell seas was confirmed.

Experiments in fish culture at Cornell university demonstrated that fish require roughage[10] in their diet. One of the most efficient and acceptable substances is cellophane; when cut into fine shreds, fish eat it ravenously along with other constituents fed.

From records kept at the Marine station at Naples, it was reported that two sea anemones have lived for a period of over 50 years. (*See* also OCEANOGRAPHY; ZOOLOGY.)

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(F. M. B.)

Marine Corps. A military corps forming an integral part of the U.S. navy, it was established by an act of the Continental congress Nov. 10, 1775, and is specially organized and trained to meet the requirements of the navy afloat and ashore. Authorized strength (Nov. 30, 1941) of the corps was 75,000 officers and enlisted men, including organized reserves on duty with the regular force. On Dec. 22, the senate passed a bill to increase the authorized enlistment from 60,000 to 104,000.

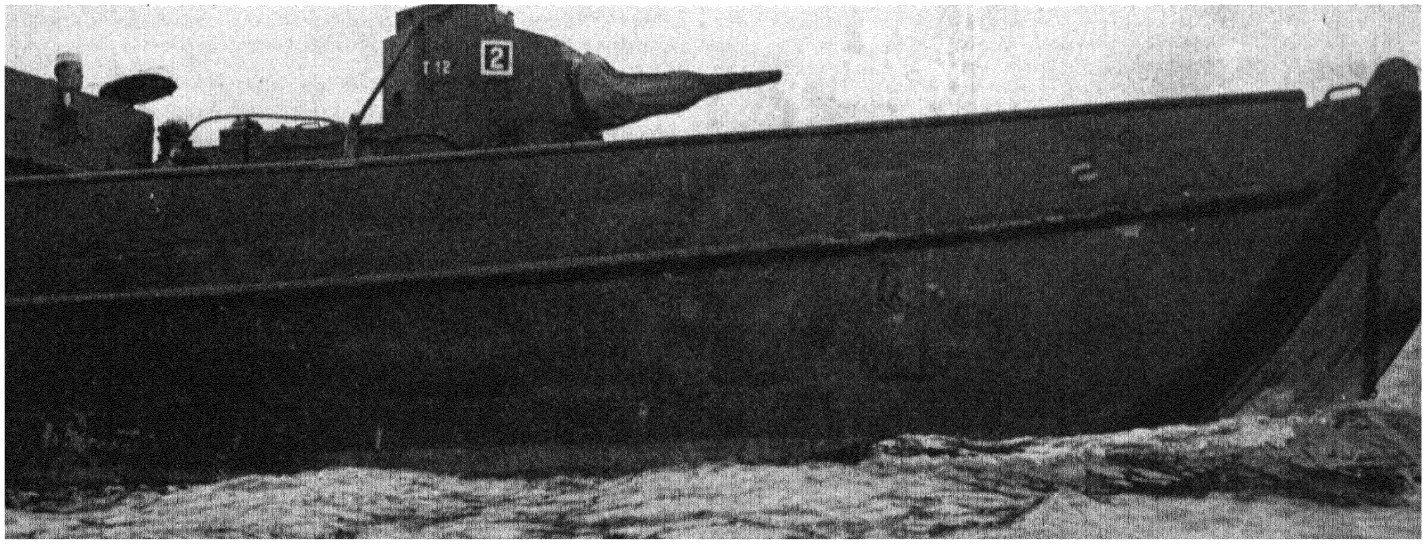
The marine corps has four distinct missions with the navy: maintenance of an amphibious striking force as a part of the active fleet; maintenance of marine detachments aboard battleships, cruisers and aircraft carriers as parts of the regular crews; provision of garrisons for safeguards for navy property at all shore stations of the navy both within and outside the continental limits, and provision of landing forces for the navy.

The marine regiment stationed for several years at Shanghai for protection of American interests there was withdrawn in Nov. 1941.

Stations from the Philippines to the Virgin Islands had their garrisons increased in 1941, and the leased bases in the Atlantic from Iceland to Trinidad were given garrisons of marines during the year.

A small garrison of 378 marines on Wake island withstood heavy Japanese attacks for two weeks in Dec. 1941 before they were finally forced to surrender. Another detachment had successfully held Midway island, at the end of the year, against repeated enemy assaults. Marines in the Philippines also saw heavy fighting in Luzon and elsewhere. Some 183 marines in

[1]From "Lands Beneath the Sea," *Scientific Monthly*, Nov. 1941.
[2]*Science News*, 93 No. 2406, 1941.
[3]*Science*, Feb. 7, B.44
[4]From *Whale Oil, an Economic Analysis*, Karl Brandt, Stanford University Press, 264 pp., 1940.
[5]*Science*, 94 p. 209 (Aug.) reported from *Nature*, 1941.
[6]*Science*, 94 p. 319 (Oct. 1941).
[7]*Science*, 93 p. 76, (Jan. 24).
[8]Beebe's Report in *Science*, 94: p. 301, Sept. 1941—as a result of collecting done on the "Zaca Venture" (Harcourt, 1937).
[9]Abstract from Report before American Philosophical Society, Autumn meeting, Philadelphia—*Science News* (Supplement) as reported in *Science*, Nov. 28, 1941, p. 10.
[10]Abstract from *Science Supplement*, 93:10, Feb. 1941.



A NEW TANK LIGHTER, built to carry U.S. light tanks ashore under enemy fire, was shown for the first time to news photographers July 18, 1941 in Onslow bay, North Carolina

Peiping and Tientsin, China were taken prisoners by the Japs.

The fleet marine force under the orders of the admiral of the fleet consisted in 1941 of two triangular divisions made up of the different arms and equipped specially for fleet duty.

Normally one division is assigned to the Atlantic coast and one to the Pacific coast, but their high mobility permits of use in any required theatre of operations, special transports and landing facilities being provided for such use.

Aviation training with naval aviation afloat and ashore is carried out, and such trained aviation units are attached to the divisions and garrisons as required.

Marine corps organized reserves in 1941 were on active duty under emergency conditions.

Officers and enlisted men of the marines are given special courses at the technical schools of the navy and the army, and special marine corps schools are established at Quantico, Va. A large correspondence course is conducted from Washington, D.C.

Officers are commissioned from graduates of the U.S. Naval academy and the distinguished military colleges and from selected qualified enlisted men.

Twenty-four were designated as second lieutenants in 1941 from the senior class of the Naval academy.

The ranks of officers and enlisted men correspond to those of the navy but the titles are those of the army from private to major general.

The commandant of the marine corps in 1941 was Major General Thomas Holcomb, who with an administrative staff is stationed at navy department, Washington, D.C.

Marine Insurance: *see* INSURANCE, MARINE.

Market Gardening.

Production of vegetables in the United States for fresh marketing in 1941 was 6,570,200 tons, about 3% less than the record production of 6,797,400 tons in 1940.

The harvested acreage in 1941 was 1,679,860, about 1% more than the 1,590,770 acres of 1940. Unfavourable weather caused the decrease in yield.

The combined harvest of vegetables for fresh marketing and vegetables for processing was, however, about 13% more than the record combined crop of 1940.

Vegetables grown for processing in the United States in 1941 totalled 11,498,200 tons.

(*See* TRUCK FARMING; *see* also LETTUCE; POTATOES; TOMATOES.)

Table I.—U.S. Acreage and Production of Market Vegetables

	1941 acres	1940 acres	1941 production	1940 production	10-yr. av. production	Unit of measure
Artichokes	10,000	10,600	700,000	848,000	889,000	40-lb. box
Asparagus*	87,960	80,880	8,375,000	7,870,000	5,698,000	24-lb. crate
Beans, green lima	17,650	13,800	990,000	975,000	790,000	32-lb. bu.
Beans, snap	174,510	165,350	14,819,000	15,033,000†	12,885,000†	30-lb. bu.
Beets	12,770	11,450	2,156,000	2,025,000	1,964,000†	52-lb. bu.
Cabbage	158,910	171,010	1,067,000	1,124,800	988,900†	tons
Cantaloups	125,910	128,770	13,605,000	13,202,000	14,607,000	std. crate
Carrots*	49,550	47,220	17,474,000	17,362,000	13,100,000†	50-lb. bu.
Cauliflower	32,800	31,510	8,900,000	9,902,000	7,501,000†	1½-bu. crate
Celery	41,690	42,110	13,146,000	13,001,000	9,771,000†	⅔ size crate
Corn, sweet New Jersey only	23,000	23,400	138,000,000	113,320,000	117,560,000	ears
Cucumbers	42,570	41,020	4,783,000†	4,609,000	4,180,000	48-lb. bu.
Eggplant	4,050	3,550	773,000	680,000	861,000	33-lb. bu.
Garlic	3,980	3,890	167,000	153,000	162,000	100-lb. sack
Kale Virginia only	1,100	900	572,000	243,000	572,000	18-lb. bu.
Lettuce	158,770	145,870	23,388,000	22,754,000†	19,041,000†	70-lb. crate
Onions	95,230	107,190	14,060,000	15,368,000	14,358,000†	100-lb. sacks
Peas, green	90,310	100,100	8,030,000	8,684,000†	8,110,000	30-lb. bu.
Peppers, green	23,070	21,360	5,074,000†	4,760,000	4,242,000	25 lb. bu.
Shallots Louisiana only	4,100	4,700	495,000	596,000	582,000†	30-lb. bu.
Spinach*	61,010	60,130	12,053,000	12,551,000	12,398,000	18-lb. bu.
Tomatoes	201,370	204,070	24,317,000†	24,126,000†	20,238,000†	53-lb. bu.
Watermelons	267,630	277,400	67,312,000	70,408,000†	68,419,000	melons

*Estimates, which are by the U.S. department of agriculture, include undetermined quantities used for processing. †Includes some quantities not marketed.

The favourable U.S. markets in 1940–41 caused Mexico to increase the early west coast vegetable acreage (1941–42 crop) to 8,750 ac., compared with 4,150 ac. the preceding season.

Cuba, although enjoying a preferential tariff for its vegetables exported to the United States, reduced its planting of winter vegetables for export because of difficulties in wartime shipping.

Table II.—U.S. Imports of Winter Vegetables for Seasons Ending May 31, 1941 and May 31, 1940

	1941 lb.	1940 lb.
Tomatoes		
from Mexico	81,843,000	23,392,000
from Cuba	48,863,000	55,902,000
Peppers		
from Cuba	7,981,000	3,860,000
from Mexico	7,192,000	4,474,000
Eggplant		
from Cuba	6,978,000	5,077,000
from Mexico	473,000	578,000
Cucumbers		
from Cuba	3,344,000	3,747,000
from Puerto Rico	2,695,000	3,400,000
Okra, from Cuba	1,478,000	1,690,000

(S. O. R.)

Marketing: *see* BUSINESS REVIEW.

Marriage and Divorce.

The most significant influence affecting family life in the United States during 1941 was preparation for national defense. This was especially notable with the lengthening of the year but it is obvious that the full force of national policy and the outbreak of war was not yet generally felt by the American home by the close of 1941. The results evident were multiple, operating upon individual families differently. The most pronounced of these influences was that of the selective draft act. This both hastened and delayed marriages and in some instances stimulated the desire for parenthood. According to a survey,[1] the major effect of the U.S. defense program was to increase marriages in 30 of the largest cities having about one-fourth of the nation's population.

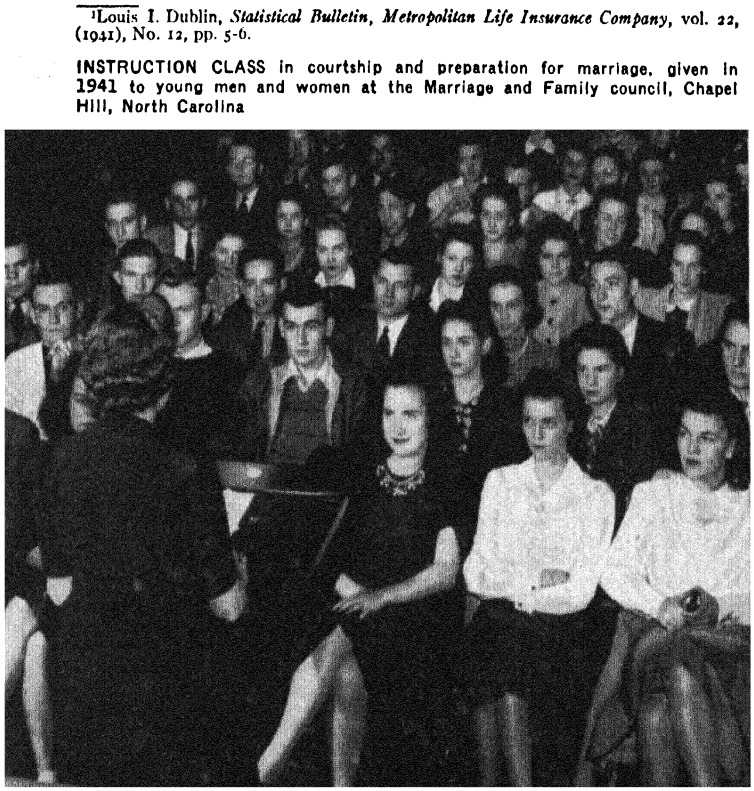
Marriages during the 11 months of 1941 exceeded those of the previous year for the same period by 8.8%. The greatest gains were found in cities having shipbuilding, metal and aviation industries.

The transition of industry from the commercial demands of a peacetime market to that of meeting the productive needs of an arsenal for democracy also affected the family. It led to an overcrowding that in certain localities revived slum conditions, caused much migration of families, changed the standards of living and in some families brought about the withdrawing of both the father and the mother from the home. This problem of both parents working was, of course, not new, but it was made greater as a result of the demand for workers in expanding industries and was bound to increase as World War II continued. Recognition of this problem led the Children's bureau to call a conference on the day care of children of working mothers. The recommendations adopted by this group resulted in the appointment of the Advisory Committee on Day Care of Children, which took over responsibility for a permanent program.

The financial consequences of the U.S. national program were beginning to be felt by individual families. Some enjoyed an increased income with a potential incentive toward conditions making for inflation, while others already felt pressure toward a lower standard of living. The national defense policy and World War II brought emotional and social reactions which had various and conflicting expressions of significance to the family, such as a feeling of fatalism and, up to the declaration of war, a division of sentiment as to national responsibilities, restlessness and the enhancing of social stress. Since family life is sensitive to these individual and social attitudes, there was already need in many communities for such an organization as the Spokane Counsel on Family Life and Education, which announced as its purpose the improvement of family living and of community conditions affecting the family.

[1]Louis I. Dublin, *Statistical Bulletin, Metropolitan Life Insurance Company*, vol. 22, (1941), No. 12, pp. 5-6.

INSTRUCTION CLASS in courtship and preparation for marriage, given in 1941 to young men and women at the Marriage and Family council, Chapel Hill, North Carolina



Development of education in marriage and family life continued its previous momentum. The most significant expression of this interest was the publication of the 1941 Yearbook of the American Association of School Administrators, discussing education for family life. This gave the educational program designed to serve the American home the official recognition of the national organization of those responsible for public school policy. The program made in the college field was beginning to be reflected in high school undertakings. It was also appearing in a greater attention to problems of the home in institutions for Negro students in the south.

This was certain to hasten social progress in the southeast. An example of this greater interest was the Homemaking Institute held at Bennett college, Greensboro, N.C., which had as its topic, "Family Relationships in a Time of Stress."

A great many conferences centring about the interests of marriage and the family were held in various sections of the United States during 1941. The following were representative of different sections and various organizations: The fourth annual meeting of the National Conference on Family Relations, at New York city, having as its general subject "Family Preparedness," an organization that already, although only three years old, has one of the largest memberships of American social organizations; the Mid-Pacific Coast Conference on Education for Marriage, the first of its kind in the Pacific area; the Virginia Conference on Family Relations, an example of the state conferences being held in connection with the National Conference on Family Relations; the National Catholic Conference on Family Life held at Mount Mary college; the Mid-West Conference on Tomorrow's Children at Chicago; the week of intensive study of the medical background of courses in marriage, held at the Duke university medical school and the University of North Carolina under the auspices of the annual April Conference on the Conservation of Marriage and the Family at Chapel Hill; and the meeting of the Connecticut Counsel of Family Relations concerned with developing a program of family education on the secondary school level.

Two problems in contemporary American life were given greater attention during 1941: first, that of old age and ageing, which interested physicians, social workers and sociologists. The National Institute of Health of the United States Public Health Service organized a new unit for research concerning the former—the National Advisory Committee on Gerontology.

The second problem which received more attention than formerly was that of nutrition as it affects family welfare. This was featured at the annual meeting of the American Home Economics association and at various other conferences, and through publications advocating intelligent purchasing by consumers for adequate family diet.

During 1941 there developed a more aggressive attack on the problem of abortion. This was expressed not only in a tightening of legislation and law enforcement but, what was more significant, in an awakening of medical and public opinion to the seriousness of the situation.

The headway that was being made against the diseases that especially endanger marriage and family life met with a setback in 1941. Although the conscripts were examined for syphilis and gonorrhoea and any giving evidence of infection rejected, the

rate of infection in the army and the navy showed that these diseases had become the foremost medical problem of the armed forces.

From preliminary data obtained from 32 states which in the past reflected accurately the trends of the entire country, the United States Public Health service concluded that during the first six months of 1941 the mortality rate from all causes per 1,000 of the population was 11·1 compared with 11·3 for the same period in 1939 and 1940. The birth rate for the same time increased about one for each 1,000 of the population, from 16·6 to 17·4, lifting the rate of national increase from 5·3 for each of the two preceding years to 6·3. The infant death rate remained the same as in 1940 but the maternal mortality continued to show a decided decrease, 20% below the rate for 1940. The increased concern for the high maternal mortality that in times past prevailed in the United States was beginning to bring gratifying results. Contributing to this interest was the publication during the year of the *Proceedings of the First American Congress on Obstetrics and Gynecology* by the American Committee on Maternal Welfare, Inc.

The division of vital statistics undertook again the task of compiling marriage and divorce statistics, a service discontinued after 1933. The gathering of the necessary data for the years 1939, 1940 and 1941 was progressing, and it was hoped that annual reports concerning divorce might be made available subsequent to 1941. If Reno can be used as a barometer, the industrial boom, resulting from defense efforts, was increasing divorces. The number of divorces granted in Reno in September was the largest during any month for two and one-half years.

During 1941 Iowa, Maine, Ohio, Utah, Vermont and Massachusetts were added to the states requiring increased marital examination for the issuance of a marriage licence. Twenty-six states in 1941 required examination by a physician of both bride and groom, including a blood test for syphilis. Seven other states had some type of premarital examination law, and 23 of these states had a prenatal examination law. In addition to the value of this legislation as a defense against venereal diseases, it also, because of a misunderstanding of the meaning of the law, helped to increase the number of persons seeking the more inclusive examination in preparation for marriage advocated by medical specialists and marriage counsellors. In order to distinguish this technique of preventive medicine from the mere testing for venereal disease required by law, some such term as examination in preparation for marriage had become desirable.

Maryland during 1941 voted to include insanity as a ground for divorce.

One of the interesting statistical studies made during the year appears in Table II, which interprets the marriage expectation of white women in the southeast. Since the marriage expectation of women is one of the conditions most influenced by war, this investigation of the situation in one section of the United States before the beginning of World War II has significance for all students of marriage. (*See* also LAW: *Domestic Relations.*)

(E. R. G.)

Table II.—*Marriage Expectation Table for White Women in the Southeast, According to Marital Status as of 1930 and Mortality Rates of 1929–31*

Age x	Female survivors at age x	Percentage married at age x	Number married survivors at age x	Number deaths among married during interval x to $x+5$	Number first marriages during interval x to $x+5$	Cumulative number marriages to age x	Number single survivors at age x	Marriage expectation at age x
0	100,000	0	0	0	0	83,301	100,000	83.3
5	92,975	0	0	0	0	83,301	92,975	89.6
10	92,273	0	0	0	0	83,301	92,273	90.3
15	91,751	0	0	186	42,032	83,301	91,751	90.8
20	90,772	46.10	41,846	933	26,549	41,269	45,926	84.3
25	89,236	75.60	67,462	1,417	9,726	14,720	21,774	67.6
30	87,505	86.50	75,771	1,807	3,308	4,994	11,734	42.6
35	85,473	90.51	77,362	2,050	930	1,596	8,111	19.7
40	83,224	91.61	76,242	2,380	465	666	6,982	9.5
45	80,626	92.18	74,321	2,813	201	201	6,305	3.2
50	77,582	92.43	71,709					

Source: *Fifteenth Census of the United States, 1930*, Population II, chap. 11, Tables 9, 17, 18, 19; chap. 10, Table 28. All sources necessary for the computation of life tables for the southeast. From Rupert B. Vance and Nadia Danilevsky, "School Life Expectation and Marriage Expectation: An Attempt to Apply the Techniques of Life Table Construction to Other Fields of Sociology," *Proceedings of Agricultural Economics and Rural Sociology Conference*, North Carolina State college, June 23–27, 1941, p. 84.

Table I.—*States Requiring Pre-Marriage Physical Examination*
(As of Jan. 1, 1942)

State	Party for whom examination is required	Condition for which examined*	State	Party for whom examination is required	Condition for which examined*
Alabama	Male	V	North Carolina	Both	E,I,T,V
California	Both	S	North Dakota	Both	S
Colorado	Both	S	Ohio	Both	S
Connecticut	Both	S	Oregon	Both	A,D,E,F,G,I,S,V
Illinois	Both	V	Pennsylvania	Both	S
Indiana	Both	S	Rhode Island	Both	G,S,T
Iowa‡	Both	S	South Dakota	Both	S
Kentucky	Both	V	Tennessee	Both	V
Louisiana	Male	V	Texas	Male	V
Maine†	Both	S	Utah†	Both	S,V
Massachusetts	Both	S	Vermont†	Both	S
Michigan	Both	S,C,G	Virginia	Both	S
New Hampshire	Both	S	West Virginia	Both	S
New Jersey	Both	S	Wisconsin	Both	S,V
New York	Both	S	Wyoming	Male	V

*Code indicating diseases for which tests are made:
A Alcoholism (chronic) D Drug Addiction F Feeble-mindedness I Insanity T Tuberculosis
C Chancroid E Epilepsy G Gonorrhoea S Syphilis V Venereal Disease
†The court can dispense with the examination under certain conditions.
‡The county clerk may dispense with the examination of the woman if she has an illegitimate child by her intended spouse and he affidavits to support it; or the department of health may dispense with the necessity of its certificates.

Marshall, George Catlett (1880–), U.S. army officer, was born at Uniontown, Pa., on Dec. 31. Commissioned second lieutenant of infantry Feb. 2, 1901, after completing his studies at Virginia Military institute and the Army Staff college, he advanced through the grades to brigadier general in 1936. In 1902 and 1903 he served in the Philippines, also from 1913 to 1916. He was with the American expeditionary forces in France in 1917, on the general staff of the first division, as chief of operations of the first army and as chief of staff of the eighth army corps. After the war he was aide-de-camp to Gen. John J. Pershing for five years. From 1924 to 1927 he was stationed in China; in 1933 he was appointed commander of the Eighth infantry and in 1936 commanding general of the Fifth brigade. On April 27, 1939, President Roosevelt appointed him chief of staff of the U.S. army with the rank of full general. In this office it was his duty to direct and co-ordinate the enormous load of activity that attended the first peacetime military conscription in U.S. history.

On Feb. 20, 1941, Marshall called attention to the critical situation in the far east and said that steps were being taken to strengthen U.S. air power in the Pacific. He endorsed aid to Britain and early in the summer urged congress to extend the training period of conscripts and national guardsmen and to remove the ban on U.S. expeditionary forces outside the western hemisphere. On April 22 he had expressed himself as well pleased with the progress of the new U.S. army which, he said, had "the highest morale I've ever seen."

Marshall was present with other high army and navy officials at the "Atlantic charter" meeting between Churchill and Roosevelt in August.

Martin, Frank Lee (1881–1941), U.S. educator, was born July 7 in Benedict, Neb. He joined the *Kansas City Star* in 1902 and worked as reporter, telegraph edi-

tor and assistant city editor until 1909, when he left to become assistant professor at the school of journalism of the University of Missouri. From 1915 to 1916 he was news editor of the *Japanese Advertiser* in Tokyo, and from 1931 to 1932 he served as exchange professor of journalism at Yenching university in Peiping, China. After serving as associate dean of the Missouri school of journalism from 1930 to 1935, he was named dean in 1935, a position he held until his death in Columbia, Mo., July 18.

Martinique: *see* FRENCH COLONIAL EMPIRE.

Maryland. A south Atlantic state, one of the original 13 states, popularly called the "Old Line state." Area, 10,577 sq.mi., of which 9,887 sq.mi. are land; pop. (1940) 1,821,244. Total urban population 1,080,351, or 59·3%; rural population 740,893, or 40·7%; white 1,516,850; nonwhite 304,394. Capital, Annapolis (13,069). Other cities include Baltimore (859,100), Cumberland (39,483), Hagerstown (32,491), Frederick (15,802).

History.—The governor in 1941, elected in 1938 for a five-year term, was Herbert R. O'Conor; secretary of state, Francis Petrott. The Maryland legislature met for its biennial session January to April 1941; 1,481 measures were introduced and 937 were passed, of which 82 were vetoed by the governor. The new legislative council established in 1939 held hearings, issued research reports on proposed legislation and made its first report to the legislature. Of 118 bills sponsored by the council, 99 or 83% were enacted into law. These included bills placing a state-wide ban on fireworks, regulating instalment selling, providing for roadside control and changing publication notices for constitutional amendments.

Thirty obsolete or duplicate laws were repealed on recommendation of the council. Among the bills sponsored by the council which failed to pass were an almshouse measure, a roadside zoning measure, and a bill regulating building and loan associations—although a measure passed requiring the latter to make reports to the state tax commission. A law was passed providing for a board of natural resources to co-ordinate activities of several state departments concerned with conservation, and the board was organized by the governor. The unemployment insurance law was modified, and numerous tax and motor control laws were passed. The Woman Suffrage amendment was belatedly ratified.

Education.—There were 1,359 public schools (1,145 elementary, 214 high) in 1940, with a total enrolment of 297,031 and a teaching staff of 8,884. The enrolment in 1941 was estimated at 299,132. The state university had an enrolment of 5,297 and a faculty of 936 in 1941. There were five teachers' colleges, with a total enrolment of 1,239 and a faculty of 67. There were 216 private and parochial schools in 1939, with an enrolment of 50,458 and a teaching staff of 2,013.

Public Welfare, Charities.—Direct relief to the amount of $2,091,913 was given to 7,131 persons in the fiscal year ending Sept. 30, 1941. WPA employment for the first 11 months of 1941 was 85,880; cost, $5,680,226. Old-age assistance for the year ending Sept. 30, 1941 was given to 17,639 ($3,888,591); aid to dependent children (mothers' pensions), 16,595 ($2,513,628); blind pensions, 652 ($174,366). Unemployment insurance was given to 40,161 persons in the benefit year April–Nov. 30, 1941; the amount spent for this purpose in the first 11 months of the year was $4,517,296.

Communication.—In 1941 Maryland had a total highway mileage of 15,317, of which 11,091 mi. were rural and 4,226 mi. were maintained by the state. State expenditures on highways for 1941 were $16,696,366. Many roads were widened and improved; 127 mi. were constructed during 1941. A bridge 2,295 ft. long over the Sinepuxent bay at Ocean City was completed. There were 1,374 mi. of railroads in Maryland in Dec. 1939. Water-borne commerce in foreign trade for the first 10 months of 1941 totalled 7,667,206 tons (2,391,936 tons exports and 5,275,270 tons imports). There were 25 airports and seaplane bases in 1941. A new municipal airport was opened in Baltimore Nov. 16, 1941 with combined airport and seaplane base facilities. A total of 335,738 telephones were operated by the Chesapeake and Potomac Telephone company Nov. 1, 1941. Four independent companies operated approximately 700 telephones.

Banking and Finance.—As of June 30, 1941 there were 112 state banks and trust companies in Maryland, with deposits of $402,964,577 and resources of $453,931,479; 12 mutual savings banks had deposits of $229,037,225 and resources of $257,940,054. There were 63 national banks as of Sept. 24, 1941, with deposits of $461,497,000 and resources of $496,224,000. Savings and loan associations numbered about 800. For the fiscal year ending Sept. 30, 1941, state receipts were $67,251,210; expenditures, $63,571,845; bonded indebtedness, $40,179,000.

Agriculture.—Through September the acreage harvested in 1941 was 1,594,300. Total farm income in the state for 1940 was $73,373,000. Rainfall was approximately 10 in. below normal during 1941. Most of the state suffered severe drought during the year, the most abnormal crop year in Maryland's history.

Table I.—*Leading Agricultural Products of Maryland, 1941 and 1940*

Crop	Production		Value	
	1941	1940	1941	1940
Corn, bu	15,164,000	16,335,000	$11,672,000	$11,108,000
Wheat, bu	7,245,000	6,897,000	7,752,000	5,380,000
Barley, bu.	2,028,000	2,008,000	1,257,000	1,024,000
Hay, tons	475,000	553,000	6,918,000	6,130,000
Red clover seed, bu.	23,000,000	24,000,000	246,000	192,000
Tobacco, lb.	29,822,000	32,640,000	10,438,000	10,771,000

Manufacturing.—The total estimated value of manufactures in 1939 was $1,027,354,074; wage earners numbered 141,643; total wages paid were $156,782,654.

Table II.—*Principal Industries of Maryland, 1939 and 1937*

Industry	Value of Products	
	1939	1937
Bread and baking	$22,245,899	$26,566,579
Canning (fruits, veg., soup)	27,302,603	30,881,579
Men's and boys' clothing	34,507,240	33,252,549
Meat packing	34,767,939	40,611,524
Shipbuilding	...	17,925,710
Tinware	35,836,828	37,040,006

Maryland defense contracts exceeded $1,000,000,000 through 1941.

Mineral Production.—The total value of mineral production in 1938 was $9,407,723; in 1939, $11,837,593.

Table III.—*Principal Products of Maryland, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Coal	$ 2,905,000	$ 2,705,000
Sand and gravel	2,827,268	1,848,211
Clay	1,709,524	1,210,947
Miscellaneous, inc. cement	40,697,718	28,491,245

(C. B. S.)

Mascheroni, Edoardo (1859–1941), Italian conductor and composer, was born Sept. 4 at Milan, Italy. Famous as a conductor at Leghorn and Rome, Mascheroni was chosen by Verdi to conduct the première of *Falstaff* at La Scala in 1893. He composed two operas, *Lorenza* (1901) and *La Perugina* (1907), requiems, chamber music and works for orchestra, piano and voice. Mascheroni also conducted in the principal opera houses of Italy, Germany, Spain and South America. He died in Milan, March 4.

Masonic Order. Details of the anti-Masonic crusade, ruthlessly waged by the totalitarian dictators for considerably over a decade, at last reached the non-Masonic writers. In the February (1941) *American Mercury,* Sven G. Lunden states that, while their persecutions of Jews and Catholics "have had considerable publicity, the merciless assaults on Freemasonry . . . are practically an unknown chapter." His article affords a brief summary of Masonic history, with a partial, though impressive, enumeration of the great figures who have made and adorned it. The most conspicuous of the victims was the craft in France, where Scottish Rite Masonry arose, but where in 1941, in both occupied and unoccupied portions, as in the other countries conquered by the dictators, all lodges were closed, their property confiscated and their members "relentlessly pursued and persecuted," according to Meyer Mendelsohn, honorary member of the French supreme council, who wrote in the April *Masonic Craftsman.*

One of the Pétain government's devices for exterminating the order was the publication in the *Journal Officiel* of the names of those previously prominent in Masonry, along with the decrees dismissing them, for that reason, from the public service. By mid-August these lists, still in the

letter C, numbered over 1,500, including such men as former Premier Chautemps, also a member of the French supreme council. Names of British and Americans residing in France were likewise published. In a decree of Sept. 19, nine generals of the army and Henri Mouton, a distinguished member of the *Conseil d'Etat*, the most respected of French tribunals, were retired because of previous Masonic connections. By November, the Vichy regime seemed to have become conscious that it had gone too far and a law was published promising exemption from the official ban of "those who had long since severed such connections or had rendered services of special importance to the state." But since the execution of the law was committed to a small government unit, its effectiveness remained to be proved.

The information concerning the victims was reported as furnished by Bernard Fay, author of *Revolution and Freemasonry, 1680–1800* (1935), French national librarian, who had been commissioned to establish a "museum" for housing documents and paraphernalia of secret societies, which the authorities seized. Fay was denounced editorially in *L'Oeuvre* on Oct. 13 by Marcel Déat, wounded with Laval, who condemned the injustice to faithful officials and defended the order against the charge of subversivism which Doriot, a former communist, had exploited by organizing a "Legion to fight Anglo-Judeo-Masonic-Soviet plutocracy." The charge appeared to be accepted by Kenneth Monroe, who wrote in the June *Scribner's Commentator* what was virtually an apology for the anti-Masonic crusade. Lunden, in the article first above quoted, had forstalled him by showing that "Masons as individuals have founded a great number of modern democratic states" and that "totalitarian hatred for the order" is due to its ideal of equality and the "Masonic dogma of Humanity." That ideal was concretely expressed by the Boise Scottish Rite bodies in presenting an ambulance to the Chinese government, bearing the inscription "Humanity above all"; by the Mother (Scottish Rite) supreme council in appropriating at its Oct. 1941 session $1,000,000 for China relief; by the Imperial Council of the Mystic Shrine in expending a like sum, not only in 1941 but annually for years, on its 15 hospitals for crippled children, of whom about 30,000 have been rehabilitated, and by the Premier Grand Lodge in donating to the British government for defense purposes £10,000 realized from the sale of Masonic jewels, contributed by British Masons. Thus, despite the ravages of war, Masonry, in English speaking countries, continued to function. Statistics for 1941 show, in the 50 grand lodges of the United States and the Philippines (where the largest increase of any, except South Carolina, appeared), 15,507 subordinate lodges and 2,464,590 members; in Canada, 1,378 lodges and 167,729 members; and in the more than 5,000 constituent lodges under the aegis of England's Premier Grand Lodge, about 400,000 members

The North American visit of the duke of Kent, brother of King George VI and Grand Master of the bodies last mentioned, symbolized the link between them and the overseas craft as did the wide publicity given by the nazi press to President Roosevelt's membership in the order. Even in prostrate France, according to Lunden, Masons, like the early Christians, "still meet in locked homes and secret circles" and, although statistics there, as in the other conquered countries, were naturally difficult to obtain, the French minister of the interior Pierre Pucheu, admitted in a public statement that there were "not more than 100,000 Masons in France." Coming from a hostile source, this would seem to constitute an approximately minimum figure.

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Massachusetts.

A north Atlantic state of the U.S.A., admitted to the union Feb. 6, 1788; popularly known as the "Bay state." Area, 8,257 sq.mi.; pop. (1940) 4,316,721 (3,859,476 urban, 457,245 rural). Capital, Boston (770,816). Other principal cities are Worcester (193,694); Springfield (149,554); Fall River (115,428); Cambridge (110,879); New Bedford (110,341); Somerville (102,177); Lowell (101,389); and Lynn (98,123).

History.—Governor Leverett Saltonstall was inaugurated Jan. 2, 1941 for his second two-year term, following the election two months previously in which the Republican party again won most of the elective offices of the state. Other state officers in 1941 were as follows: lieutenant governor, Horace T. Cahill (Rep.); secretary of state, Frederic W. Cook (Rep.); treasurer, William E. Hurley (Rep.); attorney-general, Robert T. Bushnell (Rep.); auditor, Thomas J. Buckley (Dem.). The state senate comprised 40 members (25 Republicans, 15 Democrats); the house, 240 members (143 Republicans, 97 Democrats).

The legislative session in 1941, biennial, was the longest in the history of the commonwealth—171 days in session from its convention, Jan. 1, to prorogation, Nov. 1. Legislation for defense and war constituted most of the action. The net state assessment on municipalities for 1941–42 was the lowest since World War I, with the exception of 1931–32. The net direct debt of the commonwealth between 1938 and 1941 was cut down from about $40,700,000 to $15,937,000.

When the national guard of the commonwealth was taken into army service, a new state guard of 6,000 was organized and was equipped, trained and ready for home police duty by the end of 1941.

The commonwealth during 1941 took back the East Boston airport from the city of Boston, with due compensation, and allotted substantial amounts to the federal government to help make it one of the best airports in the country. The state also bought land at New Bedford and was establishing there an auxiliary airfield for greater Boston.

One of the most productive acts of the governor was the formation of the Massachusetts Industrial Committee for National Defense. Civilian organization for home protection and regulation of consumption was rapidly completed under the direction of the committee on public safety.

Education.—In 1941 there were 2,019 elementary schools with 399,716 pupils and 14,220 teachers; 183 junior high schools with 105,006 pupils and 4,145 teachers; 263 senior high schools with 179,790 students and 6,959 teachers. The ten state teachers' colleges had a combined enrolment of 2,705 and faculties of 219. The state college at Amherst had 1,263 students and 135 faculty members.

Public Welfare, Correction.—State and municipal aid was extended to an average of 298,489 as of Dec. 1, 1941. Total yearly expenditures were $72,245,195 and were divided among the various types of assistance as follows: old age, $30,402,520; aid to blind, $333,661; unemployment compensation, $17,927,000; general relief, $12,623,649; aid to dependent children, $8,624,463; child guardianship, $2,333,902. The average number of WPA employees during the year was 57,250; expenditures were $42,526,000.

State correctional institutions included a state prison, a state prison colony, a reformatory for men, a reformatory for women and a state farm for the criminally insane, with a total average in 1941 of 5,655 inmates. Total expenditures in 1941 were $2,581,177.

Communications.—The total mileage of highways in 1941 was 23,132 (rural, 17,397 mi.). Highway expenditures in 1940 by the state government were $16,029,000, of which $11,328,000 was for construction, maintenance and administration. Railroad mileage in operation was 4,298. Exports in the first nine months of 1941 totalled $18,053,003; imports, $201,423,407. There were 44 commercial airports in Massachusetts in 1941. Telephones in use numbered 973,274.

Banking and Finance.—There were 908 state banking institutions in 1941 (191 savings banks, 182 co-operative banks, 70 trust companies, 465 credit unions) and 124 national banks. Total banking deposits were $5,101,100,082; total assets, $6,918,345,108. There were also 26 federal savings and loan associations, with resources of $126,901,971.

The state debt in Nov. 1941 (net direct) was $15,936,647.

Agriculture.—The total estimated value of agricultural production in 1941 was $75,609,000; the total acreage of field crops harvested was 432,970. Cash income from crops was $31,123,000; from livestock, $44,486,000; from government payments, $619,000.

Table I.—*Principal Agricultural Products of Massachusetts, 1941 and 1940*

Crop	1941	1940
Tobacco, lb.	10,031,000	10,141,000
Cranberries, bbl.	510,000	332,000
Apples, commercial, bu.	2,174,000	2,174,000
Potatoes, bu.	2,402,000	2,848,000
Asparagus, crates	156,000	166,000
Onions, bags	411,000	434,000
Hay, all, tons	450,000	491,000
Corn, grain, bu.	287,000	287,000
Corn, silage, tons	294,000	270,000
Oats, bu.	204,000	170,000

Manufacturing.—The estimated value of manufactures in 1941 was $3,500,000,000; the average number of employed in Dec. 1941 was 600,000 and average weekly wages were $16,572,515.

Table II.—*Principal Industries of Massachusetts, 1939 and 1937*

Industry	Value, 1939	Value, 1937
Woollen and worsted goods	$193,201,168	$232,513,060
Boots and shoes, other than rubber	140,045,664	150,999,351
Electrical machinery	117,921,691	148,798,048
Cotton goods	103,539,165	120,292,300
Printing and publishing	97,506,593	106,604,044
Clothing	93,358,623	80,502,504
Bread and bakery products	70,157,717	79,458,398
Foundry and machine shop products	75,067,337	88,706,980

Mineral Production.—The principal minerals of Massachusetts, and their individual outputs in 1940, in short tons, are as follows: coke and by-products, 1,130,311; lime, 108,797; stone, 2,176,340; sand and gravel, 3,563,760. (L. SL.)

Massachusetts Institute of Technology.

An institution of higher technical education, at Cambridge, Mass.

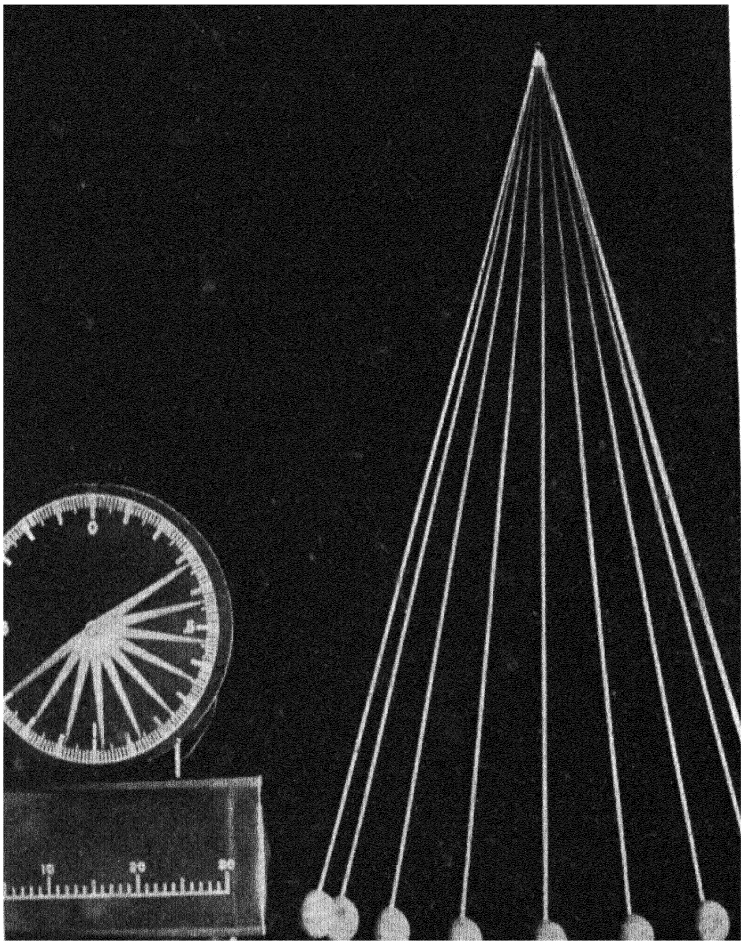
During 1941 the institute continued its normal educational program in addition to undertaking a great amount of work for national defense. It provided experts from its staff to serve on various advisory or operating committees of the government. The extent of this service is indicated by the fact that nearly 100 members of the M.I.T. staff were engaged in this type of service in 1941.

Under the auspices of the United States office of education, the institute offered 15 special engineering defense training courses and more than 1,000 students had completed the courses in 1941. Many special students from the army, navy and weather bureau also were given postgraduate training in weather forecasting, an essential feature of modern warfare.

The most important of the institute's activities in the national defense field was its research program. More than 65 separate contracts for research and development were in force in 1941. Several of the contracts included more than one project, so that the number of individual researches under way was more than 70. Of these contracts more than half were with government agencies and the rest with industrial firms. This defense research involved an increase in expenditures of approximately two-thirds of the institute's normal operating budget and required an increase in staff appointments of approximately 50%. The institute's normal operating budget, excluding the special defense program, for the year 1940–41 totalled $3,355,000; gifts received totalled $888,180; educational plant assets stood at $16,724,000, an increase of $396,000; and the book value of endowment funds totalled $35,984,500, a decrease of $31,000 during the year.

Enrolment for the academic year 1941–42 totalled 3,055, of which 679 were graduate students. Seventy-one percent came from outside Massachusetts, 64% from outside the New England states, 33% from outside the North Atlantic states and 6% from outside the U.S. There were 194 foreign students from 37 foreign countries. (K. T. C.)

VISUAL DEMONSTRATIONS of mathematical formulas were set up and photographed with high-speed cameras in 1941 at the Massachusetts Institute of Technology. The photograph illustrates $T = \pi\sqrt{\frac{l}{g}}$, where T equals the time of the pendulum swing, l the length of the pendulum cord, and g the acceleration of gravity. At the left are a clock and a scale to show the length of the swing



Mathematics. Mathematics in the U.S. was characterized by intensive research in all fields of pure mathematics and by the development of centres of instruction and research in applied mathematics. In pure mathematics, the trend toward the abstract continued, with interest centred on abstract algebra and topology. Many problems of analysis were investigated in abstract settings: the year 1941 brought important advances in the study of integration in linear topological spaces and of the Riemann hypothesis in function fields. The appearance of Wintner's *Analytical Foundations of Celestial Mechanics* and of Widder's *The LaPlace Transform* emphasized, however, that there was no lessening of interest in the older fields. New results included, among others, a proof of the ideal Waring theorem for $n=6$; new methods for the construction of diabolic magic squares; a significant extension of Cauchy's integral formula; the solution of a generalized form of the celebrated Problem of Plateau; a solution of the inverse problem in the calculus of variations; a new system of postulates for the theory of probability, based on Boolean algebra; solution of problems connected with the bending and buckling of elastic plates.

Interest in applied mathematics was an outgrowth of war. Dr. Fry's report on *Industrial Mathematics* emphasized that industry needs mathematicians to serve as consultants, and that no centres existed for their training. In response to this report, a program of advanced instruction and research in mechanics was developed at Brown university, an Institute for Applied Mathematics was established at New York university, and Massachusetts Institute of Technology announced the formation of a Research Center of Applied Mathematics.

The War Preparedness committee of the A.M.S. and the M.A.A. (1) published reports setting forth mathematical requirements of workers in industry and of members of various branches of the service and recommendations to secondary schools and colleges for meeting these requirements; (2) examined the demand for mathematicians, and the supply—already decreased by 25%; a statistical report with recommendations for the deferment of mathematicians in order to conserve the supply was expected at the end of 1941.

South America.—*Revista de la Universidad de Tucumán—Serie A: Matemáticas y física teórica* is an important new journal (first two numbers dated Dec. 1940) in South America for the publication of mathematical research.

Europe.—In Europe research continued. Erich Hecke developed a theory which establishes a connection between modular functions and Dirichlet series; it yields a connection between the theory of modular functions and multiplicative number theory. Publication of books and periodicals continued without interruption in Great Britain. Journals at least continued to appear in Germany and Italy; and publication of journals was resumed, even if slowly, in the occupied countries.

Japan.—In Japan the number of younger mathematicians continued to increase rapidly; they worked at the world's level. Subjects of investigation included abstract algebra, ergodic theorems, partially ordered linear spaces, and spectral theory in Hilbert space. *Free Groups* (Osaka University Colloquium Lectures, vol. 6, in Japanese) by S. Iyanaga was published. With the appearance at the end of 1940 of the first number of the new periodical *Memoires of the Kiushu Imperial University, Series A, Mathematics*, Japan had at least ten periodicals devoted to pure and advanced mathematics. In late 1940 Teiji Takagi of Tokyo

perial university was decorated with the "Order of Culture" · earlier works on class field theory.

U.S.S.R.—Mathematicians of the U.S.S.R., producing an ever-reasing amount of research, were signally honoured in the first ards of the Stalin Prizes. First prizes, of 100,000 rubles, went Vinogradov for work on the Goldbach problem, to Gelvich · work on the theory of gun fire, and to Muskhelishvili for rk on elasticity; second prizes of 50,000 rubles were awarded Kholmogorov and Khinchin for work on probability, to Pon-agin for his book *Topological Groups* (published also in an glish edition by the Princeton University press), and to Sob-v for research on partial differential equations. A rapproche-nt, signalized by an exchange of greetings, took place between : mathematicians of the U.S.S.R. and those of the U.S. late 1941. Both of these countries continued to receive large num-:s of mathematicians from those parts of Europe under Ger-n control.

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athews, Shailer (1863–1941), U.S. theologian and educator, was born May 26 in Portland, Me. was dean of the University of Chicago Divinity school, 1908–33, and dean emeritus after 1933. A trustee of the Church ace Union founded by Andrew Carnegie, he was an untiring ·ocate of peace. In 1937 he headed a committee appointed in neva to convoke a world conference for international peace ough religion. Among his later works were: *The Atonement l the Social Process* (1930); *Creative Christianity* (1935); *w Faith for Old: An Autobiography* (1936); and *The Church l the Christian* (1938). He died in Chicago, Oct. 23. (*See cyclopædia Britannica.*)

atsuoka, Yosuke (1880–), Japanese statesman, was born in Yamaguchi-ken of an poverished samurai family. In 1893 he went to the United ites, became converted to Christianity and worked his way ough the University of Oregon law school, graduating in 1900. returned to Japan and was appointed vice-consul at Shanghai, 04. He then spent 15 years in the Japanese foreign service. In 18 he was appointed secretary to the premier of Japan and ended the Versailles peace conference as an interpreter. In 32 he represented Japan before the League of Nations. In 40 he became foreign minister. In 1941 he made an extended) to Berlin, Rome and Moscow, secured a pact of nonaggres-n with Stalin and aligned his country more closely with the me–Berlin axis. On Feb. 21, 1941, Matsuoka warned that glo–U.S. defense measures in the far east might lead to a ngerous situation." Three days later, he told the diet that the ite race must cede "Oceania" to Japan; he defined "Oceania" a huge area in the Pacific capable of supporting 500,000,000 ople. He lost his post as foreign minister when Premier Konoye *v.*) reshuffled his government on July 18, 1941.

atter, Structure of: *see* PHYSICS.

aurice and Laura Falk Foundation, The: *see* FALK UNDATION, THE MAURICE AND LAURA.

auritania: *see* FRENCH COLONIAL EMPIRE.

auritius: *see* BRITISH EAST AFRICA.

eat. With the exception of pork, production in 1941 of the principal meats (beef, veal and lamb) in the United ites exceeded all previous years, as did consumption. The 1941 consumption was nearly 19,500,000,000 lb., about 1,000,000,000 lb. more than that of 1940, the American Meat institute reported.

Table I.—*Meat Processed under Federal Inspection Jan. 1 to Dec. 1, 1941 and 1940*

	1941 lb.	1940 lb.
Meat in cure		
Beef	122,601,000	108,448,000
Pork	2,598,722,000	2,679,000,000
Smoked and/or dried		
Beef	54,506,000	47,310,000
Pork	1,538,559,000	1,055,188,000
Bacon, sliced	292,201,000	292,779,000
Sausage		
Fresh	132,548,000	123,223,000
Smoked and/or cooked	501,401,000	555,568,000
Dried or semi-dried	113,712,000	111,424,000
Meat loaves, head cheese, chili, jellied products	130,133,000	110,294,000
Cooked meat		
Beef	6,199,000	6,638,000
Pork	233,927,000	221,744,000
Canned meat		
Beef	96,975,000	68,581,000
Pork	396,762,000	251,096,000
Sausage	79,135,000	33,411,000

U.S. exports during the first two years of the war (the period ending Aug. 31, 1941) were 231,101,000 lb. of pork and 494,173,000 lb. of lard, with shipments of meat to Great Britain subsequently expanding. Still greater increases in all meat production were scheduled for 1942. The British ministry of food announced during the first week in Jan., 1942, that the millionth ton of lend-lease food from the United States had arrived in the United Kingdom. (For details as to the number of animals produced and the number converted into meat and meat products *see* CATTLE; HOGS; LIVESTOCK; POULTRY; SHEEP; *see* also BACON; FARM INCOME for lend-lease shipments of meat to Britain.)

Table II.—*United States Storage Holdings of Meat Jan. 1, 1941 and 1940 and 5-yr. Average*

	1941 lb.	1940 lb.	5-yr. av. lb.
Beef, frozen	110,048,000	95,513,000	80,019,000
" , in cure	19,905,000	14,181,000	15,305,000
" , cured	5,770,000	3,630,000	4,053,000
Pork, frozen	177,783,000	96,506,000	209,255,000
D.S. pork, in cure	47,697,000	38,950,000	40,213,000
" " , cured	28,386,000	22,030,000	24,635,000
S.P. pork, in cure	137,370,000	121,331,000	157,158,000
" " , cured	77,820,000	68,444,000	92,977,000
Lamb and mutton, frozen	7,951,000	6,432,000	5,317,000
Frozen and cured trimmings	104,805,000	72,982,000	93,573,000
Lard	180,463,000	171,020,000	152,619,000
Rendered pork fat	4,982,000	5,445,000	..

(S.O.R.)

Medical Association, American: *see* AMERICAN MEDICAL ASSOCIATION.

Medical Research, Committee on: *see* SCIENTIFIC RESEARCH AND DEVELOPMENT, OFFICE OF.

Medicine. Stimulated by the military emergency and by the great advances made particularly in fields related to chemistry, the glands and the vitamins in recent years, investigations were especially extended along those lines. Investigations also were concerned with the viruses and the diseases that they cause and with the new techniques in surgery.

Chemical Therapy.—Outstanding among the investigations in the field of chemistry during 1941 were the new derivatives of the sulphanilamide drugs. The chief value of the new derivatives is that they are less toxic than sulphanilamide but equally effective. The sulphonamide group includes these drugs, which have been definitely recognized: sulphanilamide, sulphapyridine, sulphathiazole, sulphadiazine and sulphaguanidine. Moreover, other sulphonamide derivatives, called promin and succincyl sulphathiazole, are undergoing active investigation. Promin was reported effective in tuberculosis in guinea-pigs, but there were not sufficient studies in human beings to establish any definite merit.

Extensive use of sulphonamide drugs has aided in reducing the death rate from pneumonia to 10% in contrast with approximately 33% before the new drugs became available.

The use of the sulphonamide derivatives was extended to the treatment of influenza without, however, any conspicuous success. In meningitis, in all conditions involving the streptococcus, in gonorrhoea, in chancroid, in trachoma (an inflammation of the eyes), in dysentery, in gas gangrene and in many other conditions they were found to be invaluable. For skin disorders sulphathiazole in an ointment was used for some previously resistant diseases.

Studies made in the Panama Canal Zone showed that a shortage of quinine would not be fatal because the sulphonamide derivatives could be substituted for quinine with considerable success in cases of malaria.

By a combination of the use of sulphathiazole and heat, cases of gonorrhoeal infection were cured in from three to five days, the method being equally valuable for women and for men.

In studies made in California, sulphathiazole given together with anti-plague serum saved 98% of mice which had been infected experimentally with plague germs. The possible spread of plague during war was given special consideration at a national conference called by the United States Public Health service.

Investigators at Johns Hopkins university found that in cases of severe burns sprays of sulphadiazine were helpful in preventing serious scarring and in aiding healing.

Heparin, an anti-blood-clotting substance developed from the lung material of cows and from other tissues, has immense value in preventing the clotting of blood. Already it has been applied in the treatment of the blocking of the blood vessels in the legs and the blood vessels generally after surgical operations. It has been recommended for use in the treatment of the blocking of blood vessels in the heart and for the breaking up of blood clots in the interior of the heart. Investigators have found a derivative of spoiled sweet clover, coumarin, which apparently has the ability to prevent clotting of the blood. Studies on human patients have been made with some degree of success.

Distressed by the possibility of epidemics breaking out in air-raid shelters, the British experimented with a mist of propylene glycol sprayed into the air and reported that it was largely effective in controlling the spread of air-borne infections. The method has certain disadvantages which make it unlikely that it will be adopted on a large scale.

In certain forms of tremor associated with such conditions as Parkinson's disease, or the shaking palsy, belladonna root was found to be of value. Although reports from Europe indicated that only the Bulgarian belladonna was satisfactory for the purpose, experiments carried out in the United States showed that the American belladonna root is just as effective.

Glands.—Outstanding was the release by the United States government of the product called stilbestrol, which is a synthetic substitute for the female sex hormone. Particularly useful is a drug of this type during the climacteric in women.

Interesting experiments were carried on involving the injection of the male sex hormone, called testosterone propionate, into women in cases of cancer. This male sex hormone acts in controlling the stimulating activities of the female sex hormone within the woman's body. The use of this product will stop the flow of milk in a nursing mother. By a technique discovered some years ago pellets of the hormone can be implanted beneath the skin, from which they are slowly absorbed, permitting the effect to last for some time.

These same glandular materials were found to be definitely related to the appearance of pimples and blackheads on the skin of young boys and girls. Experiments were being made to determine how these materials could be used in the control of this unpleasant but not too serious condition.

Probably more work was done on the so-called sex glands during 1941 than on any other of the glandular products, primarily because they seem to be so fundamental to the whole structure and activity of the human body. Thus, they have been shown to be related to the shaping of the bones of the body; they also account for differences in the formations of the bodies of men and women.

Among other qualities discovered in relation to the female sex hormone substitute (called stilbestrol) was the way in which it can work together with insulin to keep down blood sugar in diabetes. Some reports indicated the value of the product for "sick headaches" in women when these are due to glandular action. Apparently some women react more definitely to these products than others, and cases were reported of sensitivity to the drug, with the usual nausea, vomiting and other signs of sensitivity. The male hormone seems to stimulate growth of prostatic tissue and the female material seems to inhibit such hypertrophy.

An extraordinary announcement was the report that pregnancy could be diagnosed by a skin test based on the use of the fluid secreted by the breasts of women previous to childbirth. Investigators at the University of Illinois college of medicine said that the test would be valid as early as two weeks after the time when the woman became pregnant. Studies made in other laboratories indicated that the test had value, but the investigators were not able to obtain a degree of accuracy much above 80%. (*See* also ENDOCRINOLOGY.)

Vitamins.—The announcement that two vitamins of the B complex, known as pantothenic acid and para-aminobenzoic acid, were definitely related to the growth of hair and to the prevention of graying of the hair aroused nation-wide interest. Studies already made indicated that the use of these vitamins had a relationship to the graying of hair, although there was some doubt as to what was the best dosage to be used in individual cases. There seemed to be no reason to believe that any vitamin yet known was important in growing hair on the human being.

Chemical studies apparently have shown that certain well-known chemicals are related to vitamin products. Thus, one report showed that manganese is necessary for the development of vitamin C in tomatoes. Another report showed that inositol, which is a part of the vitamin B complex, may be a convenient form for putting iron into enriched bread, in connection with the government's nutritional campaign.

Vitamin B complex was the centre of interest, with new evidence of its great value, through the nicotinic acid that it contains, for controlling pellagra and eliminating the 7,000 deaths which used to occur annually from this disease in the south.

Thiamin, which is vitamin B_1, is related to appetite, and it was found that even hogs which failed to get proper amounts of thiamin became less hoggish.

For years it was thought that the drinking of alcohol was responsible for the hardening of the liver that takes place in chronic alcoholics. Apparently, however, the alcohol is only incidental as a cause for this condition. The failure of the chronic alcoholic to get proper amounts of protein and of thiamin is much more important in producing this condition.

As part of the national campaign for nutrition in defense, attention was given to the preparation of tablets of vitamins to be used by American soldiers in Iceland and Alaska and to the proper incorporation of vitamins in the emergency diets used by soldiers far removed from their bases.

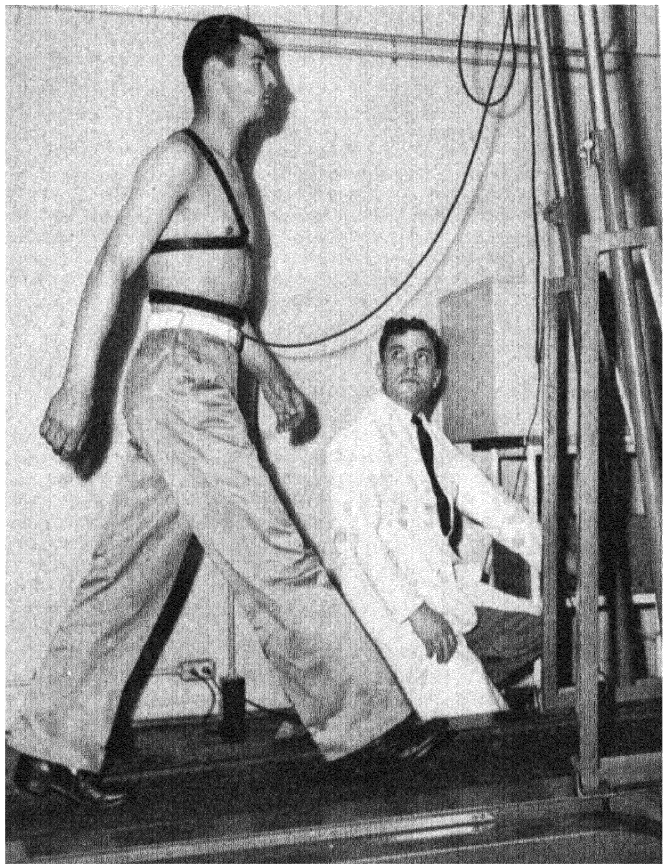
As a means of overcoming deficiencies in the national nutrition, formulas were developed for enriched bread which would contain extra thiamin, riboflavin, iron, calcium and phosphorus. Regulations were established for the inclusion of vitamin A in oleomargarine and for the addition of iodine to salt.

One group of investigators reported that the use of vitamin C after operations and during convalescence aids the healing of wounds. Another group of researchers found that vitamin C is useful in overcoming toxic reactions after the use of preparations of arsenic in the human body, such as arsphenamine, which is given in the treatment of syphilis.

Vitamin B_6, or pyridoxine, was the subject of intensive experimentation related to muscular atrophy and Parkinson's disease. (*See* also VITAMINS.)

Infections and Viruses.—Since Pasteur first established the germ causation of disease, medicine has been able to isolate the causes of many infections, the germs responsible being visible in most instances with an ordinary microscope. Such are the germs that cause diphtheria, typhoid, plague, tuberculosis and many similar diseases. More recently medical interest has centred on viruses which are so small that they cannot be seen with an ordinary microscope, so small, in fact, that they will pass through the pores of a clay filter. These viruses lie between living organisms and inert chemical substances. They have, however, the power to grow and many of them are definitely related to the causing of certain diseases. Most conspicuous among the virus diseases are influenza, infantile paralysis and epidemic encephalitis, or inflammation of the brain. On these virus diseases particularly medicine concentrated its attention in 1941.

Influenza is particularly important because health authorities continue



TESTING THE VALUE of supplementary vitamins in the diet of the U.S. army, at the University of Minnesota in 1941. After taking vitamin pills of unknown potency, a soldier walked for one and a half hours on a treadmill with electrodes strapped to his chest to record heart action

to predict a return of the severe epidemic that devastated the world in 1918. Fortunately several forms of one virus have been identified as responsible for influenza. This virus has been cultivated in the chicken embryo. Evidence was also developed that mosquitoes might be carriers, particularly the mosquito called Culex tersalis.

It has been found that a vaccine can be developed from the growing virus which, when injected into the body, will set up resistance against influenza. This is called a protective vaccine. There was good evidence that it aids in shortening the attack or in curing the influenza once it has developed. Almost at the end of the year, however, came a report that the fluids in the nose during an attack of influenza contain antisubstances against the disease, and early experiments seemed to indicate that the development of this fluid might yield a specific preventive of influenza.

Similarly, during the year several different viruses were found associated with epidemic encephalitis, which was a most serious condition during 1941, particularly in North and South Dakota, Montana and Idaho. Three hundred and forty cases were reported in a single week in North Dakota. Altogether more than 3,000 persons were affected during the summer of 1941.

Information became available that the virus of this disease could reach man not only through infected animals but also through infected chickens. This disease sometimes occurs in a form that is transmitted from horses to man, known as epidemic equine encephalomyelitis. Cases of the horse type were found in Texas, where it became necessary to destroy many horses because of the disease. Since this condition is of the type that might be spread more particularly by movements of great bodies of men associated with war, epidemiologists considered the possibility of epidemic encephalitis as a war disease.

For infantile paralysis it was established definitely that the disease can be transmitted, like typhoid, by healthy carriers who eliminate the virus from the body by way of the bowel. Moreover, the transmission of the disease would seem to be in most instances directly from persons who have the disease, but the possibility also exists that flies or other insects, feeding on human excretions, could carry the virus from such excretions to healthy persons.

Toward the end of 1941 came reports confirming the value of the treatment developed by Miss Kenny of Australia for the acute nerve manifestations of infantile paralysis in the early stages. Previous practice involved application of splints and braces and enforced rest. The Kenny method applies alternate heat and cold and other methods of stimulating circulation in muscles, also controlled movements of muscles to keep the tissues in the best possible condition to take over as soon as the acute inflammation of the disease has passed.

Blood Pressure.—Significant observations on the cause and treatment of high blood pressure were the focus of medical interest in 1941, especially the view that interference with the circulation of the blood through the kidney affected the development of a substance called angiotonin and a substance called renin, definitely related to the cause of high blood pressure or opposition to the substance that causes high blood pressure. Many patients were treated successfully by this technique, but the substances were difficult to prepare, exceedingly costly and sometimes had toxic reactions. Nevertheless, work was continuing on a large scale because this seemed to be the most significant lead ever developed as a means of controlling high blood pressure.

Insulin.—The patents for insulin expired Dec. 24, 1941. Congress passed new legislation providing for complete control of the quality of the product through multiple assays conducted in the National Institute of Health under the authority of the Food and Drug administration.

Aviation.—Many studies on aviators indicated that most aeroplane catastrophes are due to difficulties with the physical condition of the pilot rather than with the machine. New techniques for improving vision, supplying oxygen and testing psychological conditions in fliers were introduced, particularly in military aviation. For aviators at extremely high altitudes where the temperature may reach 40° below zero, new types of uniforms were developed to keep the pilot and the gunner warm.

Cyclotron.—A new cyclotron was developed in 1941 which can create 200,000,000 volt energy.

Shock Treatment.—In the treatment of certain forms of insanity, electric shock under complete control seems to be equally as useful as the kind of shock caused by insulin or by metrazol. Investigators also introduced lobotomy, a technique in which sections are taken from the frontal lobes of the brain. This technique was reported as especially valuable in cases of insanity with depression.

Rickets.—In the treatment of rickets, investigators tested the effects of one large dose of vitamin D injected directly into the buttocks as opposed to the giving of small doses repeatedly throughout infant and child life.

Rocky Mountain Spotted Fever.—An anti-serum was discovered and used successfully in cases of Rocky Mountain spotted fever. Reports from the United States Public Health service laboratory indicated vast benefit from the use of this substance in 20 cases.

Surgery.—Vitallium is a new alloy of chromium, nickel and cobalt, or molybdenum, first produced for use in dentistry. Surgeons found it extremely valuable in 1941 for the making of plates which are used to repair defects in the skull, also in reconstruction of the hip after serious damage or in cases where that is necessary to control some forms of hip-joint disease, and for filling eye sockets after removal of an eye.

Surgeons also concentrated on operations on the sympathetic nervous system associated with the control of high blood pressure. From the University of Chicago came reports that the operation on the sympathetic nervous system for high blood pressure had brought relief in 11 cases. Such cases, however, must be most carefully selected. The operation is not attempted on persons over 40 years of age.

Emphasis on the avoidance of the use of laxatives and of early operation in appendicitis, together with improvements in anaesthesia and post-operative care, brought the death rate from appendicitis to a new low record; namely, 8.9 per 100,000 population.

World War II surgery concentrated on new plastic operations and particularly on the use of the sulphonamide drugs to prevent secondary infections after operations. Preparations of sulphonamide derivatives were put into the abdominal cavity following abdominal operations, applied directly to the surgical wound where there was danger of infection through the incision. (*See* also SURGERY.)

Blood Plasma.—Especially important in surgery was the development of the use of dried blood plasma as a basis for blood transfusion. Late research indicated the possibility that the dried blood plasma from cattle might be used as a substitute for human plasma. Hundreds of thousands of quarts of plasma were in preparation for uses of the U.S. army and navy as well as that of the British military personnel. One technique involved the injection of blood directly into the bone marrow, using especially the breast bone, a method exceedingly valuable in children or in cases in which it is difficult to get blood directly into the veins.

Cancer.—Special studies on cancer brought information that cancer of the lower lip may come from chronic sunburn with repeated irritation of the lip. Cancer of the mouth was also related to the continuous use of chewing tobacco, which may act as an irritant. Other studies on cancer were concentrated on the use of metallic substances submitted to the cyclotron and thus made radioactive. Especially significant were the tests made on radio-strontium used in bone cancer. The radioactive metal is made in the atom-smashing cyclotron and carried directly to the affected bones. Early reports indicated relief of pain.

Dye substances containing lithium and boron were tested as to their effects on cancer in mice.

Chemical studies indicated definite relationship between glandular activities and cancer, and also the possibility that certain substances derived from vitamins and proteins might have specific relationships to the prevention of cancer. (*See* also ALLERGY; ANAESTHESIA; BACTERIOLOGY; BIOCHEMISTRY; BIRTH CONTROL; CHEMISTRY; CHEMOTHERAPY; DIETETICS; DRUGS AND DRUG TRAFFIC; EPIDEMICS AND PUBLIC HEALTH CONTROL; GYNAECOLOGY AND OBSTETRICS; HOSPITALS; INDUSTRIAL HYGIENE; NERVOUS SYSTEM; PHYSIOLOGY; PSYCHIATRY; UROLOGY; VETERINARY MEDICINE; VITAMINS; X-RAY. Also *see* articles on specific diseases.)

Medicine in the War.—To meet the needs of World War II, American medicine began organizing in 1940. The American Medical association circulated a questionnaire to every physician in the United States, and had available in 1941 complete information under 82 different classifications for 180,000 physicians. Furthermore, some 25,000 specialists were classified as to their professional ability, leadership, administrative ability, teaching qualifications and other factors. Another survey concerned doctors especially trained in industrial medicine.

On Oct. 30, 1941, the president of the United States signed an executive order establishing the Procurement and Assignment Service for Physicians, Dentists and Veterinarians in the office of defense health and welfare. This agency was to be controlled by a board of five physicians and had a full-time executive office in Washington, a regional office in Chicago in the headquarters of the American Medical association, and suboffices in each Army Corps area. The suboffices in the individual corps areas were also administered by boards, including physicians, dentists and a veterinarian, also representatives of hospitals and of medical education.

A duplicate of the first American Medical association roster was provided through the National Roster of Scientific Personnel in Washington. By utilizing these materials and agencies the names of physicians capable of giving service to the army, the navy, public health, civilian defense, industrial medicine and many other agencies, became available, and such physicians may volunteer for service as needed. In his executive order, the president instructed federal agencies requiring physicians, dentists and veterinarians to secure them through the Procurement and Assignment service.

Personnel.—Through the division of medical sciences of the National Research council, under the directorship of Dr. Lewis Weed, committees were established covering medicine, surgery, infectious disease, shock, blood substitutes and many other medical specialties, with a view to aiding the army and the navy in the standardization of medical procedures. These special committees were also of service in finding personnel for specific purposes.

Through the committee on information a new publication called *War Medicine* was published in co-operation with the American Medical association. War manuals have been prepared on special aspects of war surgery. The agency was also concerned with the development of the medical history of the war which would cover every possible medical aspect.

The army was aided in the development of a field manual to be used by medical officers, a manual on physical therapy, and special circular letters on venereal disease, inoculation against tropical diseases, tetanus and other conditions.

Other committees made special studies of medical problems in aviation, mechanized warfare, chemical warfare and biologic warfare.

Research.—The board of the special committees of the division of medical sciences of the National Research council co-operates with the Office of Scientific Research and Development (*q.v.*)—the Bush committee—in evaluating problems for scientific medical research in relationship to the war, in developing new problems and in making appropriations for such studies. Special consideration was being given to the problems of aviation, blood distribution and blood substitutes, shock, chemical warfare and anoxaemia.

Office of Defense Health and Welfare.—In this department, under the direction of Paul V. McNutt, there was a co-ordinating committee called Health and Medical committee, under the chairmanship of Dr. Irvin Abell, who was also chairman of the Committee on Medical Preparedness of the American Medical association. This committee included the three surgeons general of the army, navy, and United States Public Health service, Dr. A. N. Richards of the Office of Scientific Research and Development, and Dr. George Baehr of the Office of Civilian Defense. Special subcommittees were concerned with the problems of medical education, hospitalization, nursing and other medical interests. This committee was largely concerned with policies in medical affairs during the war.

Office of Civilian Defense.—The Office of Civilian Defense (*q.v.*) had a special division known as Emergency Medical service, under the direction of Dr. George Baehr. This agency enrolled the services of physicians throughout the United States in meeting any emergency which might be created by the war, including first aid, hospitalization, blood distribution, care of dependent children and mothers, transportation of wounded and many other similar matters. A subagency existed in each one of the army corps areas.

Red Cross.—The medical profession was co-operating with the Red Cross (*q.v.*) in the blood distribution program. The Red Cross assumed the responsibility for the collection of blood and of blood plasma to meet the needs of the army and of the navy. The medical profession co-operated particularly with the Red Cross in all activities of medical character. The medical aspects of the work of the Red Cross were under the direction of Dr. Albert McCown in the Washington headquarters.

Army.—The U.S. army, under the direction of Major General James C. Magee, required from six to seven physicians for every 10,000 men enrolled. At the end of 1941, there were some 14,000 medical officers on active duty, and approximately an equal number in the Medical reserve. It was anticipated that an increase of the army to 4,000,000 men would require at least 28,000 physicians.

Navy.—The navy, under the administration of Rear Admiral Ross T. McIntire, utilized some 5,000 physicians in its work.

United States Public Health Service.—The United States Public Health service expanded greatly to meet war needs, and undertook particularly the prevention of disease in areas surrounding army camps and large industrial centres. This work was under the direction of Surgeon General Thomas Parran.

Scientific Problems.—Particular interest attached to the increased ability of modern medicine with new drugs to prevent serious infections of war wounds, and to control such conditions as pneumonia. Sickness and death rates in the U.S. army during the period of mobilization were the lowest in any army at any time. The reports of casualties in Hawaii on Dec. 7 indicated that the number of infected wounds was less than in any previous engagement of army and navy personnel in battle. The subsequent mortality from wounds was the lowest ever reached in such incidents. More than 60% of the casualties in the navy were due to burns. In the treatment of burns, the use of blood plasma to prevent shock and of the sulphonamide derivatives to prevent infection greatly improved the treatment, shortened the duration of illness and prevented mortality.

All American soldiers and sailors were inoculated against typhoid fever, smallpox and tetanus. Sailors going into tropical areas had the benefit of inoculation against typhus, cholera and plague.

Nutrition.—In the army, standard diets were calculated according to the best modern knowledge of nutrition, so that the food supplied to the army was well above that of any other nation in the world.

Socialization of Medicine.—Concentration by federal agencies on health in the national emergency seemed to bring about a lull in activities related to socialization of medicine. In the meantime, more than 14 states, through their state medical societies, developed mutual plans for extending medical service to large numbers of workers, the outstanding plans being those of the Michigan State Medical society and of the California State Medical society. Under the Michigan plan almost 400,000 workers had voluntary hospital insurance through their industry, and also 100,000 were covered by insurance against surgical fees. A small number of workers seemed to be interested in insurance against ordinary medical fees. The Farm Security administration provided a system of insurance against medical costs for some 105,000 farmers and their families throughout the United States. This system was developed by co-operation between the Farm Security administration and the county medical societies in various parts of the country. In his message to the congress, President Roosevelt recommended expansion of the Social Security law to provide compensation for workers disabled in industry, with a view also to getting hospitalization and care.

Private insurance agencies throughout the United States extended insurance against the costs of hospitalization, surgical fees and medical care, so that many hundreds of thousands of workers in major industries were covered by such insurance. In most cases the cost was divided between the worker himself and the industry which employed him.

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THIS 18-MONTH-OLD LONDON BOY had 60% of his body covered with second- and third-degree burns after a German raid of April 1941. Though a 30% burn is usually fatal, he was revived with saline solutions, then placed in a tub of salt water kept at constant temperature. In June he was able to stand in his bassinet

Mediterranean, British Possessions in: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Meighen, Arthur (1874–), Canadian politician, was born June 16, at Anderson, Ont. Raised on a farm, he was educated at St. Mary's Collegiate institute and at the University of Toronto. After teaching in Collegiate institute, Caledonia, Ont., and in Winnipeg, he was called to the bar

at Winnipeg in 1903. He then practised law at Portage la Prairie, Manitoba.

Meighen was elected to the Canadian house of commons in 1908, and was re-elected in 1911, 1913 and 1917. He was solicitor general, 1913; secretary of state for Canada, 1915–17; minister of interior and superintendent general of Indian affairs, 1917. He went to England with the prime minister, Sir Robert Borden, to attend the Imperial Conference of 1918. Meighen was premier of Canada from July 1920 to Dec. 1921, and again July–Sept. 1926, till defeated in a general election; he was also minister without portfolio in the Bennett cabinet (Feb. 1932). He was chosen as leader of the senate in 1932, and was selected to lead the Conservative party in 1941.

Mellon Art Gallery: *see* SMITHSONIAN INSTITUTION.

Menocal y Deop, Mario Garcia (1866–1941), Cuban politician, was born Dec. 16 in Matanzas province, the son of a wealthy sugar planter who fled to the United States during the Cuban revolution, 1868–78. Menocal, who was graduated from the engineering school at Cornell university, returned to Cuba in 1891. He joined a Cuban army of rebels, fought in the war of independence, 1898, and won renown as a military strategist. He rose swiftly in politics and was elected president of the island republic in 1912 and was re-elected in 1916. But charges of maladministration persisted through both of his terms (1913–21), and the man hailed as a liberator in 1912 was regarded with suspicion in the early twenties. He remained a power in Cuban politics, however, until Machado assumed office in 1925. Menocal was twice imprisoned and finally fled to Miami, Fla.

He returned to Havana and was again engaged in politics when he died in the Cuban capital, Sept. 7.

Menzies, Robert Gordon (1894–), Australian statesman, born Dec. 20 and educated at Grenville college, Ballarat, at Wesley college, Melbourne, and at Melbourne university. He practised law in Victoria and entered the Victorian legislative council in 1928, and the provincial assembly the following year. From 1932 to 1934 he was attorney-general and minister for railways in the cabinet of Victorian Premier Argyle, and for a short time in 1934 was acting premier. In that year he was appointed attorney-general and minister for industry in the dominion cabinet of Joseph A. Lyons. Upon Lyons' death in 1939, Menzies was elected to succeed him as leader of the United Australia party and received his commission to form a cabinet. Immediately upon the outbreak of war Sept. 3, 1939, Menzies' cabinet approved a declaration of war against Germany. The following month he re-introduced compulsory military training in Australia. On March 14, 1940, he reformed his cabinet along coalition lines to include three members of the Country party.

Menzies left Australia in Jan. 1941 for a series of conferences in London. Early in February he visited Australian forces in North Africa. In London for two months thereafter, he conferred frequently with Winston Churchill and members of the war cabinet on Australia's part in the war; he also paid a visit to Eamon de Valera in Eire. He returned to Melbourne May 31 to face a growing opposition in parliament which was due partly to the Libyan, Greek and Cretan defeats, and partly to the Labour party's insistence that the prime minister should remain in Australia and not return to London.

Menzies resigned Aug. 28 and was succeeded by Arthur Fadden (*q.v.*), in whose cabinet he remained as minister of defense coordination.

Mercury. Production of mercury in the United States in 1940 reached the highest level since 1883, with 37,777 flasks of 76 lb. each, or 1,302 metric tons. The monthly output had been more than doubled during the course of the year, and the output was sufficient to meet all domestic demands, supply net exports of 9,446 flasks and add 1,731 flasks to stocks. There were no imports after April, and the total for the year was only 171 flasks, against exports of 9,617 flasks. Production rose from 3,100 flasks in Jan. 1941 to 4,211 flasks in September, and the total for the nine months was 32,200 flasks, 21% more than the same period of 1940. The total for the year was expected to come close to 45,000 flasks. Imports during this period were comparatively small but had increased over those of 1940; 104 flasks of Spanish mercury appeared in March and April, probably from bond, rather than by direct importation, and in August 500 flasks were received from Canada, followed by 75 more in September, and 200 flasks from Mexico. Exports during 1941 were much less, being 1,560 flasks to the end of September. Consumption during the first three quarters of 1941 was 32,200 flasks, 70% more than the same period of 1940, and was expected to reach 43,000 flasks for the year. Stocks at the end of Jan. 1941 had reached 14,512 flasks, but had dropped to 12,716 flasks at the end of September.

In June 1940 the price of mercury was at a high of $208–$212 per flask, dropping to $164–$166 at the end of the year; there was a gradual recovery in 1941, to $197–$199 in November, in spite of a warning issued in March that the government considered the $180 current at that time to be higher than was warranted by existing conditions or future prospects.

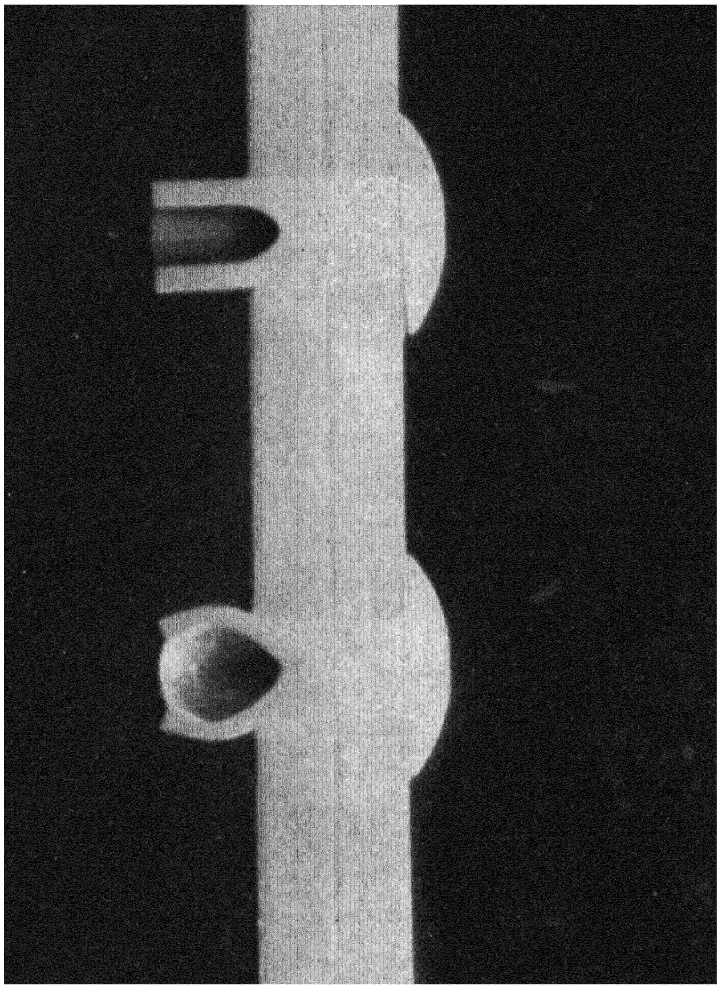
Mexican production had increased to 593,343 kg. (17,198 flasks) to the end of July 1941, as compared with 185,265 kg. (5,370 flasks) in the same period of 1940, and 401,700 kg. (11,653 flasks) for the year. Although in the past Mexico had been the only other North American producer, Canada entered the list with a small experimental output in 1939, and in June 1940 started a new plant treating 50 tons of ore daily from a deposit at Pinchi lake, B.C. Late in 1941 the addition of 250 tons capacity to this plant was announced, and while no reports have been made on output, judging from such data as have been published, this should give Canada an output of something like 30,000 flasks a year. (G. A. Ro.)

Merezhkovsky, Dmitri Sergeievich (1865 – 1941), Russian novelist and critic, was born Aug. 2 in St. Petersburg (Leningrad). Among his later books were *The Romance of Leonardo da Vinci* (1931) and two volumes on Christ, *Jesus the Unknown* (1934) and *Jesus Manifest* (1936). His death in Paris was revealed in a Vichy dispatch dated Dec. 9. (See *Encyclopædia Britannica.*)

Metallurgy. Heavy demand for all kinds of metals, and shortage in the supply of most of them, resulted in many new developments to speed up production, save time and material in fabrication, and make use of substitutes wherever possible. With the still greater demand that would result from the active entry of the United States into the war, 1942 was expected to see even greater extensions of the type of progress that had been made in 1941, as indicated in the following brief notations on some of the high lights of the year's progress.

Die Castings.—Die-casting machines were growing in size and weight, and were being made with interchangeable pots and plungers, so that the machine might be adaptable to more than one type of alloy.

Explosive Rivets.—One of the most interesting of the new metallurgical developments was the use in aircraft construction of a rivet with a hollow end, in which is embedded a small charge of explosive. These are used at points where the under side of the work is inaccessible for heading in the usual way, the operation being accomplished by the application of heat to the head of the rivet; when the explosive is set off by the heat, the end is



EXPLOSIVE RIVETS, perfected in 1941, are set with greater speed and ease than is possible by mechanical means. An explosive placed in a cavity at the end of the shank is detonated by the heat of an electric gun applied to the rivet head. The explosion expands the cavity and forms a "blind" head which sets the rivet. The photograph shows the rivet before and after setting

expanded and the rivet is set in place.

Flame Cutting.—The old established methods of flame cutting, using an oxyacetylene torch, were adapted to shape a rough form from a steel bloom, to replace a casting.

Inclusions.—A scheme for the classification and identification of inclusions in cast iron and steel was reported to the British Iron and Steel institute by Marrogh.

Powder Metallurgy.—The new applications of powder metallurgy were relieving the load on the die-casting industry, and at the same time were expected to play a part in the solution of many problems involving compounding as well as forming, as applied to war production.

Superfinish.—To what extent the aeroplane industry would be able to make use of the developments made in superfinishing by the automobile industry was a matter of speculation.

Surface Hardening.—This new type of localized hardening, making use of either flame or electrical heating, was expected to save time in certain types of war work, as a substitute for case hardening or nitriding.

Testing Methods.—The X-ray, radiography, magnetic and photoelastic methods, and measurement of hardenability and machinability were among the newer testing processes which were finding new fields of use and broader application.

Ultrasonics.—There were on the market in 1941 generators of ultrasonic waves, that is, sound waves above the hearing limit of the human ear, and several new applications were being tried out in the testing of metals for flaws, cracks, inclusions and voids; another angle that showed promise was in the better dispersion of liquid alloys and of metal powders, and there were indications that these waves might help in the degasifying of metals and in the penetration of the hardening agent in surface hardening processes.

Bismuth.—The machinability of stainless steel might be improved by small additions of bismuth, but at the loss of some part of the impact value, tensile strength and elongation.

Cobalt.—Belgian Congo cobalt residues were being smelted at Niagara Falls, along with ores from Canada.

Magnesium.—The heavy demand for new plant capacity for magnesium called for new sources of raw materials, which would include not only the former magnesium chloride, but also magnesite, and magnesia dolomite, recovered from sea water. Tests were to be made with bruceite.

Manganese.—Progress was being made with processes for the recovery of manganese from low-grade ores.

Sodium.—Metallic sodium was being used as a coolant for the valve stems of aeroplane engines, the metal being placed in a hollow stem, so that when melted by the heat, it could by convection and conduction carry the head away from the head of the valve to the base of the stem, where it can be absorbed in the cooling jacket.

Stainless Steels.—Excessive demand for aircraft was expected to lead to the use of stainless steel parts, due partly to the shortage of aluminum and partly to better resistance of steel to high temperatures and abrasion.

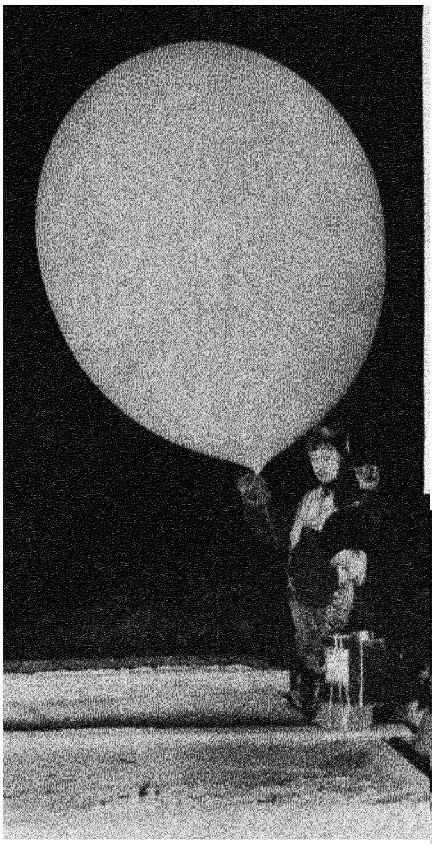
Tin.—There were seven small tin smelters in operation in the United States in 1940, and in 1941 a plant with a capacity of 18,000 tons of metal a year was being built near Galveston, Texas, the ore supply having been contracted for in Bolivia. The developments of the year-end in Malaya and Netherlands East Indies would probably lead to an extension of these activities. (*See* also articles on individual minerals.) (G. A. Ro.)

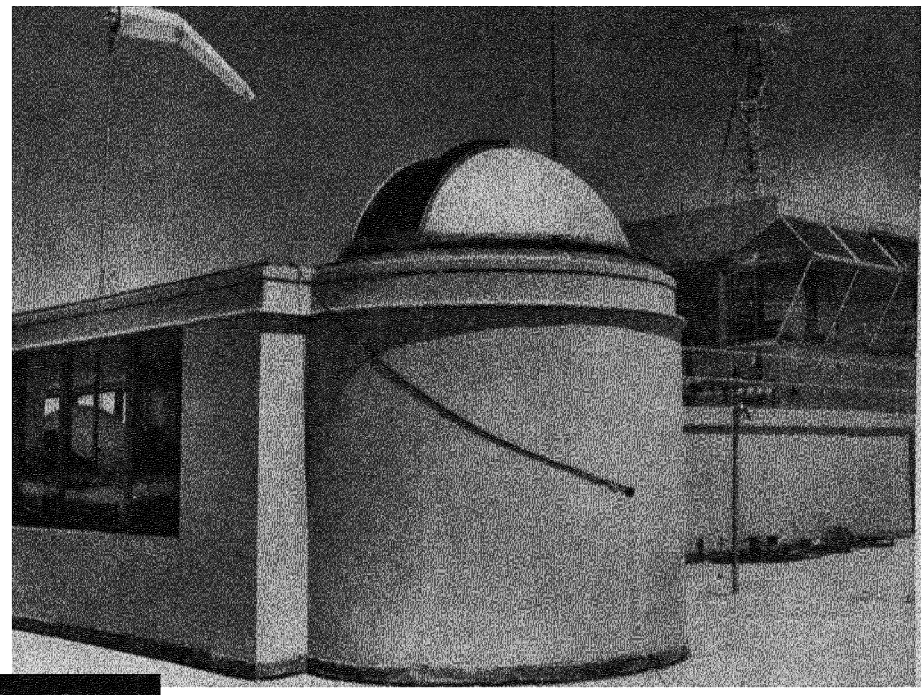
Metal Prices and Production: *see* MINERAL AND METAL PRICES AND PRODUCTION.

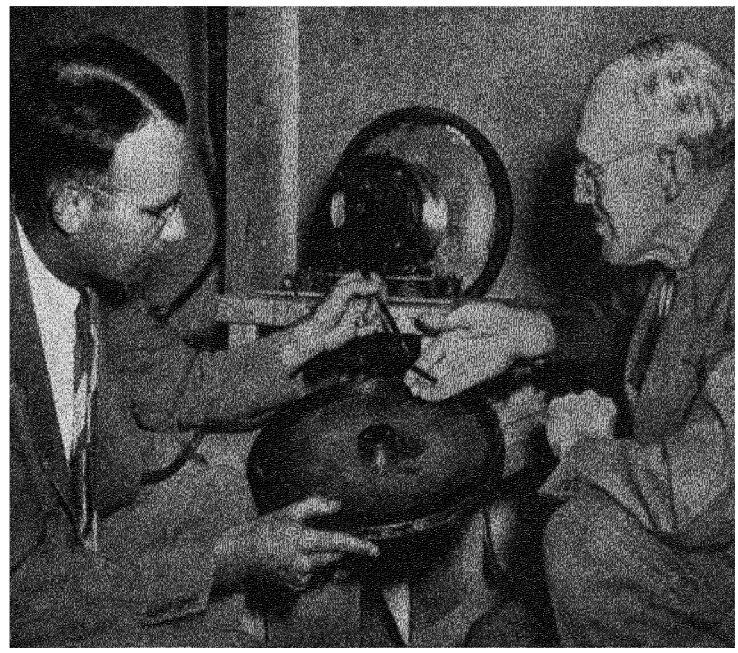
Metaxas, John (1871–1941), premier and dictator of Greece from 1936 until his death, was born April 12 on the island of Ithaca. He attended military schools in Greece and Germany and served as commissioned officer in both the Graeco-Turkish War in 1897 and the Balkan Wars, 1912–13. His ability in directing field operations in the latter conflict earned him the post of chief of general staff in 1915, and he became King Constantine's closest military adviser during the war of 1914–18. Twice exiled from Greece, once for plotting an unsuccessful monarchist revolt, Metaxas returned to his country's good graces and in 1926 was given the post of minister of communications in the newly created Greek republic. He was appointed minister of state in 1935 and a year later became premier. Once established in the premiership, Metaxas showed his scorn for democratic procedure. One of his first acts was to abolish parliament and all political parties. He declared martial law to quell a general strike, and with the consent of King George II he proclaimed himself chief of state and ruled Greece with an iron hand. Following the fascist pattern of one-man government, he organized a secret police system, established a youth movement, assumed control over labour unions and advocated a Spartan life for modern-day Greeks. He also took over the portfolios of war, navy, air, foreign affairs and cults and national education. Metaxas again displayed keen military judgment when Italian armies attacked Greece in Oct. 1940, and was credited with the Greek successes against the invaders in the ensuing campaigns in Albania. He died at his suburban home near Athens, Jan. 29.

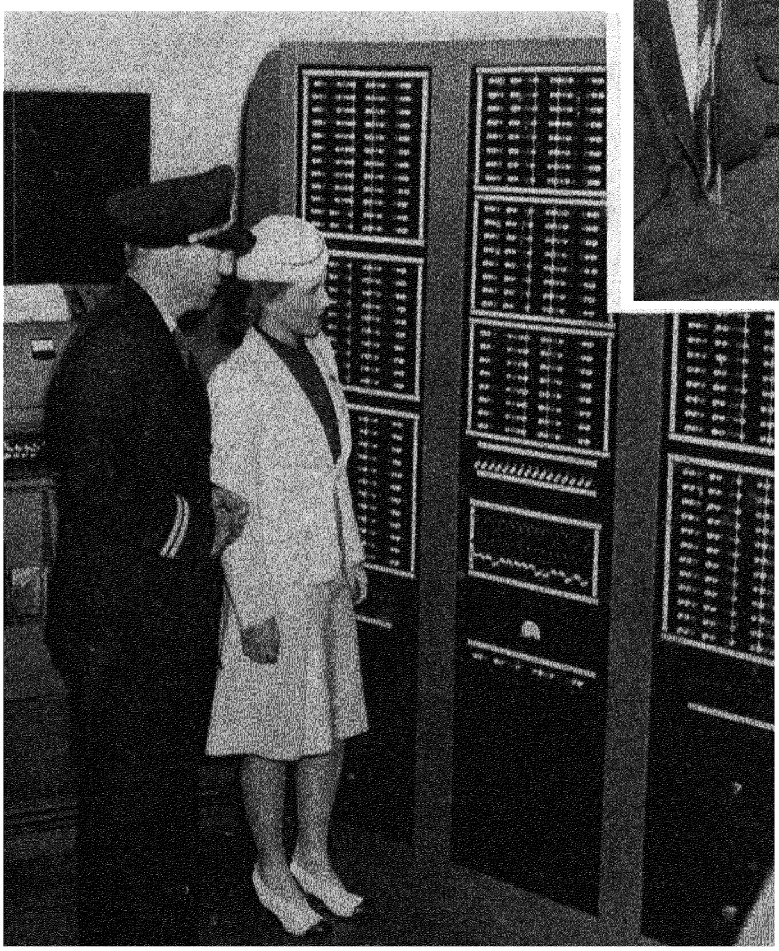
Meteorology. An outstanding development in meteorology during 1941 was the large-scale adaptation of its uses to military purposes. While the importance of weather in war has long been obvious, the comparatively short time-range in forecasting had heretofore limited its military usefulness to the planning of actions (such as gas attacks, aerial reconnaissance and adjustments of artillery ranges) that could be executed on short notice. With the rapidity of modern military operations and the corresponding time-extension of weather forecasts, however, the two were brought together and the usefulness of the latter decidedly increased—particularly in the prediction of fog, winds and clouds for naval and large-scale aerial activities and of conditions that might affect short-period land actions and communications.

In the United States, where military uses of weather information in World War II had been watched closely since its beginning, the start of hostilities in December found the weather bureau and the meteorological branches of the army and navy already co-operating closely and prepared to put the national meteorological service on a war footing at once. The control of Canadian and marine reports was extended to a complete shutdown of radio broadcasting of synoptic data. The special forecasting services for Great Lakes shipping, construction of plants, regulation of manoeuvres, scheduling of aviation practice and transport of bomber fleets were raised to a level of first-priority importance. Improvements in the meteorological services of Alaska and the Caribbean sea, already well advanced as a preparatory defense measure, were accelerated. And studies of climatological data, already providing helpful guidance in the location









Above, left: RELEASING A WEATHER BALLOON at the west base of the U.S. antarctic expedition. Members of the expedition brought back valuable meteorological data when they returned to the U.S.A. in May 1941

Top, right: WEATHER STATION of the Washington National airport, opened June 16, 1941. The flight of weather balloons is followed with a telescope in the observation dome

Above, right: LIGHTNING MEASURING MACHINE installed in a copper smelting plant at Anaconda, Mont. in 1941. The small steel strip in the hand of the man at the right, placed in the circuit of the fulchronograph in the background, is magnetized by lightning bolts. Whenever the strip is found to be magnetized, engineers know that the magnet steel fins on the wheel of the fulchronograph have been magnetized also and have recorded the duration and intensity of the bolt

Left: FROM A "TELE-REGISTER" PANEL of the weather station at Washington National airport, meteorological information is distributed from Alaska to Central America

Table I.—*Monthly and Annual Mean Temperature and Extremes in °F., 1941, in Cities of the United States*

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	An. Dept.*	Highest	Lowest
Albuquerque	36.0	42.8	45.0	50.6	63.8	70.2	76.0	75.1	67.3	56.6	45.5	37.7	55.6	+0.3	94	18
Bismarck	11.6	15.2	26.6	45.6	59.6	66.0	73.3	71.0	57.2	45.8	32.5	23.7	44.0	+3.0	109	−24
Buffalo	24.5	23.6	26.2	48.2	54.6	66.0	72.1	67.8	65.1	52.8	43.8	33.8	48.2	+1.2	90	3
Charleston	49.6	45.5	51.4	66.0	73.0	78.7	81.6	82.4	78.4	73.8	60.2	54.4	66.2	+0.2	99	28
Chicago	28.1	25.6	32.0	52.7	62.4	69.4	73.7	73.6	68.8	56.9	43.2	36.4	51.9	+2.7	98	− 5
Del Rio	55.4	55.2	57.6	70.3	76.2	81.8	85.0	85.4	80.8	74.2	59.4	54.0	69.6	0.0	101	32
Helena	22.6	27.8	36.6	44.2	54.6	61.6	69.2	67.0	50.4	42.4	35.6	24.4	44.7	+1.4	98	−29
Houston	57.0	53.4	57.4	70.2	76.6	81.2	84.2	84.6	80.8	75.7	59.8	57.6	69.8	+0.7	98	32
Knoxville	40.7	36.6	44.0	62.8	70.5	76.2	79.2	79.0	75.8	67.1	48.0	45.3	60.4	+2.0	98	17
Los Angeles	57.6	58.8	60.6	59.1	67.9	66.0	70.7	71.2	68.0	66.0	65.4	57.6	64.0	+1.6	97	40
Memphis	43.3	40.0	47.4	64.8	73.0	78.8	82.5	81.8	76.9	69.0	49.0	45.2	62.6	+1.0	99	19
Miami	66.7	64.8	67.4	74.4	76.3	81.6	82.2	84.6	81.9	80.6	74.6	73.2	75.7	+1.3	92	38
Mobile	52.8	50.0	55.2	68.6	75.0	80.4	81.9	83.8	80.7	75.6	58.0	55.6	68.1	+0.8	98	28
New York	29.8	31.4	35.7	56.0	63.0	70.2	74.7	72.7	69.0	60.0	49.6	38.2	54.2	+1.9	94	9
Norfolk	40.4	38.0	44.0	60.6	69.6	74.8	79.1	78.2	75.0	68.8	55.9	47.4	61.0	+1.5	98	21
North Platte	27.8	30.2	35.5	50.6	64.6	69.0	75.1	75.1	64.8	52.0	41.0	31.0	51.4	+3.1	99	− 6
Oklahoma City	41.4	40.4	46.2	61.2	71.6	75.6	82.5	82.2	75.2	63.9	50.2	44.3	61.2	+1.8	104	19
Portland, Me.	17.1	24.4	27.3	46.4	55.0	63.8	68.0	64.2	58.8	48.2	39.9	29.4	45.2	−0.3	97	−14
Portland, Ore.	44.2	48.8	54.9	56.4	59.0	63.2	72.8	68.6	61.4	56.4	49.4	43.8	56.6	+3.5	103	23
San Francisco	54.0	55.4	58.4	55.8	61.2	60.0	60.2	61.2	63.5	60.8	58.4	53.4	58.5	+2.4	89	41
Sault Ste. Marie	14.3	18.4	22.6	45.4	53.0	64.8	65.5	61.4	56.4	44.8	34.4	23.8	42.1	+2.9	92	− 9

* Annual departure.

Table II.—*Monthly and Annual Rainfall, in Inches, 1941, in Cities of the United States*

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	Annual Dept.
Albuquerque	1.17	0.20	1.00	1.20	3.07	0.90	2.15	1.07	1.85	2.67	0.37	0.23	15.88	+ 7.82
Bismarck	0.57	0.14	0.79	1.60	1.03	5.64	2.32	2.91	3.91	1.01	0.31	0.09	20.32	+ 4.01
Buffalo	2.36	2.05	2.01	1.69	1.11	0.82	3.37	1.06	0.87	2.40	3.06	1.36	22.16	−13.84
Charleston	1.63	2.56	3.55	1.38	0.07	11.03	13.39	12.77	0.78	2.55	2.36	10.56	62.63	+17.41
Chicago	2.26	1.01	2.60	2.63	3.42	3.43	1.10	2.16	5.20	8.44	2.07	0.97	35.29	+ 2.43
Del Rio	0.61	1.13	1.89	1.81	1.21	0.80	3.35	0.95	4.90	7.21	0.22	0.25	24.33	+ 4.43
Helena	0.25	0.15	0.31	1.74	1.67	2.86	2.29	0.61	2.27	0.88	0.40	0.77	14.20	+ 0.57
Houston	2.06	3.06	5.59	7.23	5.33	9.21	5.21	3.13	6.91	10.23	1.71	2.32	61.99	+14.94
Knoxville	2.28	0.87	4.13	4.01	0.71	3.95	8.37	3.34	0.97	2.54	2.55	2.45	36.17	−11.21
Los Angeles	2.21	12.42	8.14	2.07	T	T	T	0.04	0.00	1.53	0.65	4.22	31.28	+16.05
Memphis	2.82	1.68	1.30	3.72	0.99	1.20	3.51	3.45	0.46	5.62	1.69	4.01	30.54	−17.18
Miami	3.45	3.75	5.01	6.74	0.32	6.65	9.44	0.66	7.03	3.04	4.66	1.19	51.34	− 4.32
Mobile	3.53	4.21	5.49	2.34	1.42	10.11	13.60	3.71	5.21	3.91	3.72	7.34	64.59	+ 2.98
New York	3.33	3.31	2.52	3.12	1.52	4.04	4.60	5.32	0.11	1.43	2.78	4.12	36.20	− 6.79
Norfolk	2.12	2.58	2.50	3.24	0.94	4.31	4.52	4.99	2.80	2.37	1.57	2.87	34.81	− 9.28
North Platte	0.30	0.36	0.65	3.64	1.55	2.30	5.35	0.81	3.31	1.07	0.23	0.42	19.99	+ 1.60
Oklahoma City	1.12	1.83	0.58	5.90	5.22	5.99	1.08	3.08	4.57	10.35	1.49	1.07	42.28	+11.13
Portland, Me.	2.79	3.07	2.24	0.71	1.46	0.70	2.35	2.61	1.42	2.13	2.89	2.90	25.27	−16.67
Portland, Ore.	5.24	1.45	2.01	1.56	4.97	1.05	T	1.63	3.58	2.45	4.62	10.38	38.94	− 2.68
San Francisco	8.24	6.71	4.75	4.05	1.18	0.01	0.01	0.03	T	0.93	1.99	7.29	35.19	+13.17
Sault Ste. Marie	1.09	1.23	0.41	3.06	2.79	1.18	4.35	4.11	6.49	5.63	2.46	2.93	35.73	+ 5.79

T = Trace: less than 1/100 of an inch.

Table III.—*Duration of Sunshine, in Hours, 1941, in the United States*

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	Annual Dept.
Albuquerque, N.M.	204	222	244	245	306	326	333	295	283	242	263	176	3139	−297
Bismarck, N.D.	123	161	191	145	262	290	367	300	201	182	133	101	2456	+207
Buffalo, N.Y.	80	107	204	302	291	349	368	308	294	144	99	70	2616	+275
Charleston, S.C.	176	165	195	240	363	259	287	275	303	253	222	161	2899	− 32
Chicago, Ill.	92	138	193	231	327	277	357	319	269	182	161	85	2631	− 21
Del Rio, Tex.	154	160	185	224	235	259	318	318	207	157	153	132	2502	−204
Helena, Mont.	176	230	240	243	328	307	367	283	158	213	124	114	2783	+108
Houston, Tex.	131	120	130	153	243	184	234	214	162	153	200	135	2059	−739
Knoxville, Tenn.	150	171	201	254	347	267	282	261	320	203	176	136	2768	+156
Los Angeles, Calif.	195	150	274	245	335	294	330	281	297	268	260	173	3102	−116
Memphis, Tenn.	113	139	181	239	334	291	256	297	276	157	182	164	2629	−149
Miami, Fla.	154	137	182	237	329	280	324	339	193	231	141	112	2659	−302
Mobile, Ala.	168	141	148	227	297	186	207	220	210	213	141	98	2256	−492
New York, N.Y.	149	203	264	339	322	307	262	343	307	211	217	168	3092	+416
Norfolk, Va.	100	188	230	296	365	291	290	331	291	262	219	176	3099	+379
North Platte, Neb.	180	163	173	170	288	262	307	287	231	171	191	163	2586	−507
Oklahoma City, Okla.	119	148	240	204	293	310	356	332	284	156	218	183	2843	−165
Portland, Me.	184	220	242	318	321	322	369	313	273	170	187	157	3016	+487
Portland, Ore.	93	140	237	225	219	202	363	189	125	132	76	74	2075	− 76
San Francisco, Calif.	101	97	250	243	255	335	264	247	317	253	173	134	2669	−266
Sault Ste. Marie, Mich.	72	90	204	220	223	292	281	233	114	65	60	34	1888	−212

Table IV.—*Monthly Rainfall in Inches Outside the United States, Oct. 1940—Sept. 1941*

Cities	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
London	2.4	6.8	1.1	2.5	1.9	3.2	1.7	1.9	1.9	4.1	5.9	0.3
Edinburgh	2.3	3.7	2.3	1.5	2.8	2.8	1.2	3.0	0.9	3.0	2.9	1.0
Stockholm				0.4	2.0	1.1	0.2					
Lisbon	4.3	1.9	1.0	7.8	4.3	3.5	4.8	1.3	0.4	1.1	0.0	
Calcutta		0.0	0.0	1.2	0.0	0.0	0.9	2.9	20.1	15.6	24.8	
Bombay		0.8	0.0	0.7	0.0	0.0	0.0	0.0	8.1	14.0	5.8	
Baghdad	0.04	0.03	0.5	0.0	1.6	0.5						
Singapore			11.0	13.2	2.7	5.2					6.1	
Cape Town	1.6	1.1	0.5	1.0	0.5	1.5	5.3	5.9	4.5	3.7	2.6	3.9
Johannesburg	1.0	6.6	7.5	5.5	3.4	4.9		0.0	0.9			
Salisbury (Rhodesia)	2.6							0.1	0.8	0.0		
Quebec	3.3	6.2	3.8		0.9	1.9	2.0	1.4	2.3	5.4	5.7	4.2
Toronto	1.7	4.8	3.8	2.6	1.4	1.6	1.3	2.3	1.6	4.8	1.9	0.8
Winnipeg	2.7	0.8	0.7	1.2	0.3	0.7	0.9	3.6	2.6	2.5	3.8	5.9
Victoria, B.C.	2.4	3.2	3.3	1.9	1.8	1.0	1.3	1.1	0.7	0.1	1.5	2.2
Sydney	2.6	2.4	8.4	3.8	2.0	1.5		1.9	2.0	2.3		2.3
Melbourne	0.8	1.7	2.1	6.7	0.9	2.2	2.5	1.1	3.4	2.3	2.6	3.2
Perth	2.4				0.1	0.4	3.1	2.7	8.2	8.3	4.1	
Wellington, N.Z.	4.2	3.9	2.7	4.1	6.4	4.5	2.6				10.2	4.7

of camps and factories, the orientation of airport runways, the determination of efficient flying levels and the scheduling of long-range activities of various kinds, were extended at once to include climatic surveys of foreign areas of likely operation by American military forces.

Notable improvements in American meteorological practice resulted from the perfection of the radiosonde and the adoption of the air-mass system of forecasting. In a broad sense these two contributions might be considered interdependent—at least to the extent that air-mass forecasting on an areal scale as great as that of the United States could scarcely succeed without the current records obtained by radiosonde of upper air conditions and movements. At the close of 1941, twice-daily flights of this instrument, reporting humidity, temperature and atmospheric pressure through vertical heights of the order of 12 mi., were being recorded at 40 stations in the United States and its possessions. These data, representing an accurate cross-sectional measurement of atmospheric conditions and circulatory actions aloft, constituted an invaluable aid in the analysis of the three-dimensional charts upon which modern forecasting is based.

With this and other refinements in basic observational procedures combined with an enlarged use of teletype and radio in communications, the range and usefulness of applied meteorology broadened considerably. Engineering, transportation and industry particularly found uses for this service of hitherto unrealized value; and the same was true to a somewhat smaller extent in the fields of advertising, public health, agriculture, construction and chemical manufacture. It was notable that the bulk of unsatisfied demands, from a wide range large-scale human activity, reflected no lack in either the accuracy or the content of weather forecasts, but rather called insistently for extension

of the time-period covered by them. The five-day forecasts inaugurated in late 1940 in the United States met some of these demands satisfactorily; but to a very large extent the problem of long range forecasting for periods exceeding five days was still unsolved.

The beginning of hostilities in Dec. 1941 produced an almost immediate curtailment in the issue and publication of official weather information. This curtailment, shaped to the double purpose of withholding information from the enemy and at the same time continuing essential service to civilian interests, necessarily imposed a considerable inconvenience upon many lines of activity, a number of which were directly connected with the production of war materials and the conduct of other defense work. At the close of the year, under the president's stipulation requiring the control of information by means of "voluntary censorship," the office of censorship and the weather bureau were formulating a plan of press publication for weather information expected to meet all essential civilian as well as military requirements.

Table V.—*Monthly Mean Temperatures in °F. Outside the United States, Oct. 1940—Sept. 1941*

Cities	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
London	50.3	45.1	39.7	34.8	39.7	42.3	44.9	49.3	61.5	65.9	59.9	59.5
Edinburgh	48.1	43.4	39.7	32.1	36.2	37.9	41.3	47.1	54.7	59.2	56.5	56.9
Stockholm				13.3	21.2	27.5	35.2					
Lisbon	61.0	55.9	49.6	48.9	52.7	54.5	57.2	59.4	68.7	71.8	72.7	
Calcutta		78.3	69.1	68.7	73.8	85.1	89.5	88.7	86.0	84.5	84.9	
Bombay		83.7	77.8	75.1	78.0	80.7	84.9	86.4	80.6	82.5	82.5	
Baghdad	77.2	65.1	56.3	51.5	58.9	62.1						
Singapore			80.3	80.3	81.7	82.7					82.1	
Cape Town	64.3	64.7	68.9	72.0	70.2	69.1	62.1	58.3	56.3	56.2	58.6	57.5
Johannesburg	62.6	65.1	67.0	67.3	66.5	65.3		60.4	52.7			
Salisbury (Rhodesia)	66.7							62.3	58.4	57.3		
Quebec	43.0	31.0	17.0		18.0	24.0	44.0	54.0	63.0	69.0	62.0	56.0
Toronto	48.1	38.1	29.8	22.5	23.9	27.3	50.5	58.3	68.7	72.1	68.1	63.5
Winnipeg	48.8	20.5	12.9	4.3	4.3	17.3	42.1	56.5	64.5	68.5	63.9	53.7
Victoria, B.C.	53.3	42.9	43.5	43.8	45.7	48.9	51.9	55.1	58.1	62.9	60.1	56.1
Sydney	65.1	66.5	71.5	70.1	70.4	68.9		59.3	54.9	55.3		61.1
Melbourne	61.5	60.1	67.1	65.7	67.3	63.0	61.7	51.5	51.3	50.1	51.7	54.5
Perth	62.0				77.9	70.0	65.0	61.9	59.1	57.1	57.5	
Wellington, N.Z.	51.8	54.7	60.1	62.9	60.7	61.1	54.7				45.3	50.3

Weather of 1941 in the United States.—In the United States the weather during 1941 was decidedly abnormal in several respects. Following the general trend since the turn of the century, the year was warmer than normal practically everywhere. Rainfall was unusually heavy over the western two-thirds of the country and was decidedly scanty in a central-eastern area. There was less sunshine than normal in the central valleys and generally in the south and more western states, but there was more than the usual amount from the middle Atlantic area northward and in the northwest. The year was outstandingly cloudy in the Gulf area.

Temperature.—The tendency for above-normal warmth was present in all seasons of the year. The average winter temperature was above normal everywhere except in parts of the Atlantic area. The spring, March–May, had slightly below-normal temperatures in the south and some eastern sections, but it was substantially warmer than normal throughout the northern half of the country, the plus departures ranging from 3° to 5° in most sections. The summer was somewhat cooler than normal in the southwest and parts of the Great Basin, but elsewhere it was warmer than normal, with the greatest plus departures in the same area as for the spring. The fall season, September–November, was relatively cool west of the Rocky mountains, but elsewhere temperatures averaged considerably above normal.

In January the lowest temperature recorded was —43° at Taylor Park, Colo., and in Alaska —65° at Fort Yukon. In February the lowest in the states was —40° at Edmore, N.D., and in Alaska —42° at Fort Yukon. The highest for the year was 124° in Death Valley, Calif. For the year as a whole the temperature averaged above normal in practically all parts of the country, with the largest plus anomalies, 2° to nearly 5°, in north central states from the Ohio and middle Mississippi valleys northward and northwestward.

Precipitation.—While both the spring and the fall were abnormally dry in the eastern states, for the country as a whole 1941 was one of the wettest years of record, the last half being especially wet nearly everywhere west of the Mississippi river. Louisiana, with a state average rainfall of 60.5 in., was the wettest state, and Nevada, with 13.8, the driest. An outstanding feature of the year's rainfall was the reversal of usual conditions as reflected in the heavy rains in western states and relatively light amounts in the east. The southwest was especially wet, with five states having more than 150% of normal annual precipitation, while west of the Mississippi river only Arkansas and Washington had deficiencies and these were small. On the other hand, the middle Atlantic states, led by Virginia, were abnormally dry.

It was the wettest year of record in North Dakota, Utah and New Mexico, the last named having had more than a third more precipitation than had occurred in any previous year of record. It was the second wettest year of record in Nevada, Arizona, Texas, Oklahoma and Kansas, and the third wettest in California. On the other hand, several of the more eastern states had far below normal. Tennessee had the driest year of record, Kentucky, Virginia and Maryland the second driest and North Carolina the third.

For the U.S. as a whole the average annual precipitation was 32.36 in., or nearly 12% above normal; there were only two wetter years of record in the climatological history of the country. It is noteworthy, for example, that Kansas, in the area where severe drought prevailed during the 1930 decade, had more rainfall in 1941 than either of the Virginias, Maryland, Ohio, Indiana, Kentucky and even Tennessee. Rainfall in these states is normally much heavier than in Kansas.

Floods.—Excessive rains in several areas, especially in June and July, resulted in heavy flood damage. In the Sacramento valley of California floods occurred in February, March and April, with a total property loss of more than $1,000,000, and losses in Missouri and Arkansas in April amounted to more than $1,500,000. The most damaging floods of the year occurred in June and July in the Missouri, Ohio, Arkansas and Red river basins, and in July in the rivers of western Texas, resulting in a total of some $12,000,000 damage. (*See* also FLOODS AND FLOOD CONTROL.)

Destructive Storms.—Noteworthy destructive hailstorms occurred in Rooks county, Kan., on June 15, damage $172,000; in several Iowa counties on the same day, damage $143,000; in Calhoun county, Ia., July 10, damage $150,000; several counties of central and southwestern Minnesota July 17, damage $767,000; Fergus county, Mont., July 18, damage $250,000; in the vicinity of Blanca, Colo., Aug. 20, damage $600,000; and at Sugar City, Colo., on the same day, damage $100,000.

An outstandingly destructive storm, remarkable for suddenness and severity, swept into the northern Great Plains from the adjoining Canadian provinces on March 15. It was the most severe storm of record in the Red river valley of the north and some adjacent sections, when the wind of moderate velocity from the southwest suddenly shifted to the northwest with very high velocities, attended by drifting snow. The temperature dropped from around the freezing point in the early evening of the 15th to considerably below zero by the following morning. Many motorists were caught on the highways, unprepared, and found it impossible to proceed with the blinding snow driven by winds of gale force, reaching 60 to 70 m.p.h. About 60 people lost their lives in North Dakota and Minnesota, with heavy property loss. (*See* also DISASTERS: *Natural Disasters.*)

(F. W. RR.)

Other Countries.—The values for monthly rainfall and monthly mean temperatures given in the accompanying tables referring to countries outside the United States are provisional and may in some cases require a small correction. On account of war conditions it has not been possible to give complete data for some of the stations. Gaps in the tables indicate that the data could not be obtained. (D. BRU.)

Methodist Church. Membership figures for the Methodist Church, as of July 1, 1941, were as follows: Members in the United States, 6,993,975; in other lands, 354,770. The large apparent decrease was due to the discontinuance of the practice of counting "inactive members" in the total. There were 23,924 ministers in the U.S. and 2,211 elsewhere. Sunday school enrolment was 5,152,887 in the U.S. and 314,701 in other countries.

The collection on "Compassion Sunday," March 2 (and after), produced $957,000 up to Dec. 1. The collection was being divided between the service of soldiers and sailors, relief of British Methodists and for war sufferers generally. In addition, the Commission on Overseas Relief raised more than $200,000, much of which was sent to China.

The central conferences elected bishops as follows: Germany, F. H. Otto Melle (re-elected); southern Asia, Shot K. Mondol and Clement D. Rockey; China elected Carleton Lacy, Z. T. Kaung and W. Y. Chen. Bishop John Gowdy retired. Latin America elected Enrique Balloch in place of Bishop Roberto Elphick, retired.

The Methodist Publishing house closed its printing plant near New York city on July 1 to concentrate the manufacture of books and periodicals in Nashville, Tenn., Cincinnati, O. and Chicago, Ill. The Methodist building in New York city was remodelled at a cost of $250,000 and a new building for the publishing house in Nashville, Tenn., was authorized. The house had the most profitable year since 1929, and distributed to the retired preachers a dividend of $200,000. In place of the 55 Sunday school periodicals formerly issued by the three churches, the publishing house issued, beginning Oct. 1, a carefully graded series of 25 periodicals, which started off with a circulation of 4,400,000. The *Christian Advocate*, the one official weekly, issued at Chicago, Ill., Dr. Roy L. Smith editor, maintained a circulation exceeding 260,000.

The churches contributed $4,166,262 to the World Service and General

Administration fund in the fiscal year ending May 31, 1941, a decrease of 3.12%. Receipts of the Episcopal fund (for maintenance of the episcopacy) were $631,650 and disbursements, $412,721. The General Administration fund received $125,999 and disbursed $99,095.

The war disrupted Methodist foreign missions to an unprecedented degree. Communication with the workers in most of the European countries occupied by the nazis was cut off, and some of the missionaries interned. Germany and Czechoslovakia were notable exceptions. The Finnish Methodists especially suffered severe privations. In Japan the government forced the denominational groups into a united Church of Christ in Japan. Most, if not all, of the Methodist missionaries in Japan, Korea and occupied China were withdrawn, some of them finding work in India and the Philippines. West China, Chiang Kai-shek's domain, was urging that more young workers be sent. Bishop Lee in Malaya reported great ingatherings. The same was true of the Philippines. The total receipts of the division of foreign missions from Jan. 1 to May 31, 1941, were $987,585. The total giving of the Methodist church for all purposes in the year ending May 31, 1941, was $90,323,961, of which $7,950,303 were for missionary, philanthropic and educational purposes.

In Chicago, in November, the new 22-story building of the Wesley hospital was dedicated. It adjoins the downtown campus of Northwestern university medical school. The Methodist hospital in Brooklyn, N.Y., on Dec. 4 laid the cornerstone of Buckley pavilion (surgery), to cost $1,125,000.

Very large gifts to Methodist education, missions and philanthropy were made in 1941 by Mrs. Sterling Morton of Chicago, Ill., Mrs. Henry Pfeiffer of New York, N.Y. and the Collins family of Portland, Ore.

A gathering at Baker university, Baldwin, Kan., in August formed the Methodist Youth Fellowship, an organization which replaced the Epworth League and other existing young peoples' societies of the three churches. Kempton Jones of Salisbury, N.C., a student in Duke university, was elected president and Harvey Seiffert of Nashville, Tenn., secretary. It is claimed that 2,000,000 Methodist young people are eligible to membership. Departments were provided for worship and evangelism, world friendship, community service, recreation and pleasure. Nashville, Tenn. was designated as the central office.

The council of bishops in December in their statement on the war which Japan had launched said: "Our duty as American citizens is clear. The enemy leaves us no alternative. In answer to the challenge of international immorality our president has avowed for himself and for our people the determination that the forces of brutality and treachery must be permanently broken. In this crisis, as in all previous crises in our history, the Methodists of America will loyally support the president and the nation."

It was reported that the Methodists rank next below the Quakers and Mennonites in numbers in the camps of conscientious objectors. Pacifist teaching was emphasized by prominent Methodist preachers and in statements by the Commission on World Peace. One much publicized case was that of one H. W. Kuhns, a Methodist youth of high reputation in Redlands, Calif. On his refusal on conscientious grounds to be inducted into the army, he was sentenced to two years in jail. Bishop Baker and leading Methodist officials expressed the belief that the conviction was a miscarriage of justice. The district attorney thereupon announced an investigation to ascertain whether the churchmen had not been guilty in the affair. But before he could start operations, Washington became aware of the case and an order from Attorney General Biddle arrested his action.

Great Britain.—War conditions led to the Methodist conference meeting in Leeds instead of London as appointed in 1940. So thin was the attendance that it was called a "shadow conference," and it completed its business in four days. The officers were Rev. W. H. Armstrong, president; Lord Rochester, vice-president and Edwin Finch, secretary. Officers elected for 1942–43 were Rev. W. J. Noble, president; Herbert Ibberson, vice-president and the secretary re-elected. Proposed amendments to the Deed of Union were adopted. One reduced the size of the conference; the other, which conferred unprecedented powers of appointment on the president, was strongly opposed. A declaration of support for the government in the war was carried by 131 votes against 16, with 9 not voting. Rev. Henry Carter made the pacifist protest against war and Dr. Scott Lidgett supported the action. The total membership reported was 770,653. The conference heard with regret that the decline in membership, which has cost the Methodist Church 90,000 members since the union (1932), had continued, the net loss in the year 1941 being 13,482, with only 2 out of the 46 districts reporting an increase. The collections for missions and other connectional purposes were being well maintained. War activities included 180 army and navy chaplaincies and more than 500 canteens. Methodist women knitted more than nine tons of "woollies" for the men in the service. Bombing raids damaged 1,500 church properties, 400 of them so that they cannot be used. Several central halls, including Manchester, were totally demolished. The church co-operated with the government in handling the damage problem. The War Emergency fund reached a total of £116,996, much of which was contributed locally, with large contributions from Methodists in the colonies and largest of all from the United States. (J. R. J.)

Mexico. A federal republic, between the United States and Central America and bordering the Pacific and Atlantic (Gulf of Mexico). Area, 767,168 sq.mi.; pop. (1940 preliminary census report) 19,546,135. Capital: Mexico City (1,451,616). Other principal cities: Guadalajara (220,049); Monterrey (180,942); Puebla (137,324); Mérida (98,334); León (86,089); Tampico (81,334); Aguascalientes (81,124); San Luis Potosí (78,042); Torreón (76,613); Veracruz (74,541); Chihuahua (57,456); Pachuca (52,387). About 55% of the population was mestizo, 29% Indian, 15% white. Foreigners constituted less than 1%. About 14% speak only Indian tongues. Religion: Roman Catholic. Mexico includes 28 states, each with its own governor and legislature and a limited autonomy, and three territories and a federal district, with governors appointed by the president. The national government is administered by a president elected for six years, and a bicameral congress. The 170 members of the chamber of deputies are elected for three years and the 58 senators for six years, by universal suffrage. President in 1941: General Manuel Avila Camacho (*q.v.*).

History.—In 1941, developments in Mexico were strongly influenced by affairs abroad. Politically, the country was quiet, but economic expansion was limited by external conditions resulting from the war. Mexico continued to tie her destiny with that of the other American republics, especially the United States, by economic and diplomatic bonds, but remained technically at peace.

Throughout the year Mexico was beset with the problem of maintaining her neutrality in World War II and her part in the defense of the hemisphere without sacrificing internal political and economic freedom. The situation was met with a program of close collaboration with the United States in everything short of war.

In the first few months of 1941, a naval and air base on the Pacific was planned, with La Paz, Baja (Lower) California, as the site; the cancelled Japanese fishing rights on the west coast were denied renewal; the Spanish fascist Falange organization was subjected to close government scrutiny; and two German ships with 269 officers and men and 10 Italian vessels with crews numbering 291 were interned in Mexican ports.

In August, 13 army officers were assigned to United States posts to study modern military methods, and reconstruction was begun on the antiquated 190-mi. Isthmus of Tehuantepec railroad, an alternate route to the Panama Canal. In September Mexico obtained credits for the purchase of 160 military planes from the United States. Shipment of vital war materials to non-American countries was banned in July. Close scrutiny of exports was ordered in October after the discovery of large quantities of contraband mercury ready for shipment on a Japanese steamer at Manzanillo.

When the United States entered the war, Mexico took further strong steps toward hemispheric defense. On Dec. 10, all Japanese funds were frozen; former President Gen. Lázaro Cárdenas was appointed to command all land, sea and air forces on the Pacific coast; and troops, gunboats and planes were rushed to that sector, two battalions crossing through United States territory into Baja California. United States and Mexican air forces co-operated in patrolling the west coast from the border of the two countries to the Panama Canal, and four Japanese fishing boats were seized off Baja California Dec. 12 and Dec. 19. Plans to fortify the west coast harbours of Mazatlán, Manzanillo and Magdalena bay went into formative stages Dec. 15, and a bill according nonbelligerent status to any American nation at war with a non-American country was passed unanimously by the senate Dec. 24, permitting troops, warships and planes of such American governments to use Mexican territory, waters and ports. On Dec. 27, Pres. Avila Camacho sent a bill to congress to broaden and strengthen the powers of judicial agencies dealing with espionage and sabotage. Telephone communication with the strategically located María Madre and Tres Marías islands in the Pacific and with Mazatlán and Mexicali on the west coast was opened in the interests of national defense.

Meanwhile, popular support of the president's co-operation with the United States in the war against the axis was manifested on Dec. 14, when 30,000 workers staged a demonstration in the capital applauding the administration's anti-axis policies. The next day groups of teachers and university students announced cessa-

tion of all anti-United States activities and wholehearted support of the government's stand. Although Mexico failed to declare war by the year's end, it had firmly embarked on a policy of close co-operation with the United States in the role of an arsenal for the democracies, especially in supplying food and strategic materials.

The year's political trend followed the program outlined by Pres. Avila Camacho in his inaugural address in 1940. Instead of a definite swing to the right, as many expected, the new administration policy was rather to slow the pace of Mexico's second six-year plan and to consolidate gains already made. In keeping with this policy was the administration's political toleration and delicate balancing of the political scales between left and right, which made 1941 stand out as a year of striking internal tranquility. Tomás Garrido Canabal, violently antichurch former governor of Tabasco, and Gen. Plutarco Elías Calles, former president and long-time political boss of Mexico, who had been exiled by the Cárdenas administration in 1935 and 1936 respectively, were permitted to return to Mexico. Later in the year cabinet changes replaced two leftist members with more moderate ministers, one of them the president's brother, Maximino Avila Camacho, a close associate of the rightist wing of the administration. But the appointment of Gen. Cárdenas, actual leader of the left wing, to high military command (*see* above) was regarded as counterbalancing any political effects.

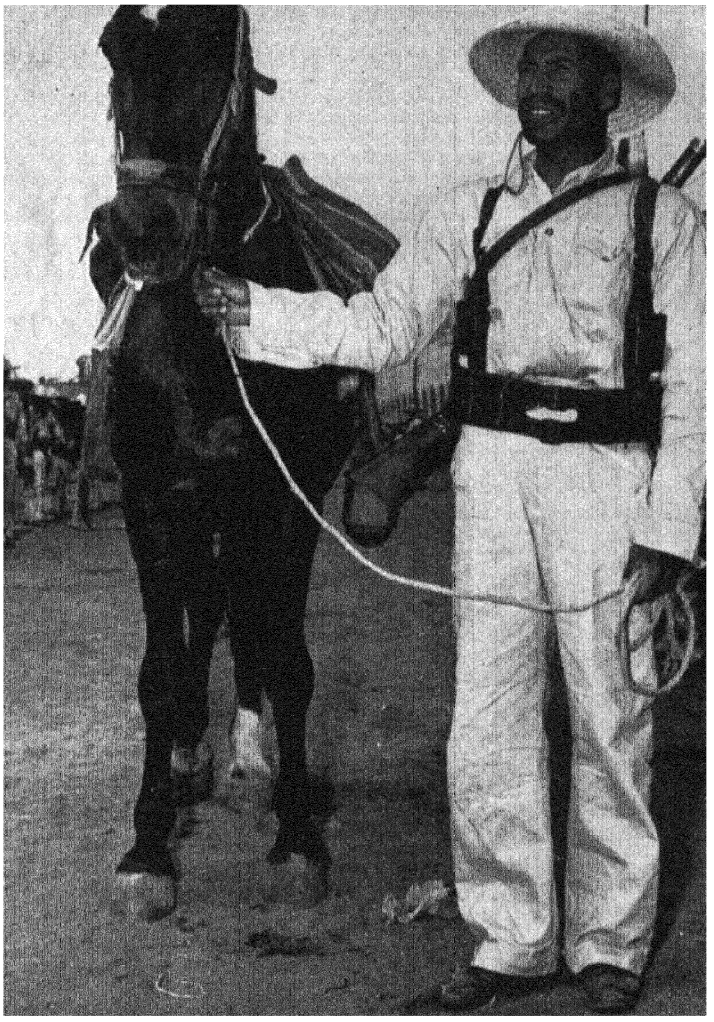
Administration control over organized labour as a political force seemed assured in February when Vicente Lombardo Toledano, intransigent radical political boss of the powerful Confederation of Mexican Workers, formally relinquished his office of secretary-general and was replaced by a more moderate leader —Fidel Velásquez. In November, however, Toledano was re-elected president of the international Confederation of Latin American Workers at its congress in Mexico City, and he remained a potent force in the labour movement. Meanwhile, in March, Velásquez, affirming a policy established in 1940, issued a stirring manifesto which strongly condemned the axis powers in Europe and aligned Mexican labour with the democracies.

The only serious threat to Mexico's political unity was made by the Sinarquista party, a pro-fascist rightist group strongly organized among remnants of the church party and large and small landowners. A plan to colonize scantily populated Baja California with Sinarquistas, including many Spaniards, was unanimously opposed by the chamber of deputies in October, but Pres. Avila Camacho authorized the settlement with the reservation that not more than a third of the colonists be Sinarquistas, and the senate approved the measure. The administration's political trend was well indicated in the year's economic developments. Strikes continued to hamper industry, with no more restriction than a six-day "cooling off" period required by law.

The land redistribution program slackened in 1941, but the principle of collectivization continued in force. Although newly distributed plots were given in private ownership, their alienation in any way was prohibited, and failure to utilize them for two years meant loss of rights to them. The large ejidal, or collectivized districts of La Laguna, Los Mochis and the Yaqui valley were specifically exempted from subdivision into private plots. During the year ending Aug. 31, 1941, 2,075,535 ac. were distributed among 36,340 persons.

In March the National railways, reorganized under a board of labour and government representatives, began paying monthly instalments of 1,200,000 pesos on its accumulated deficit of some 13,000,000 pesos. Six modern locomotives were purchased from the United States in August. In November the government made $40,000,000 available for urgent improvements, including the purchase of more rolling stock.

The oil industry, operating at an accumulated loss of about



IRREGULAR of the Mexican army participating in manoeuvres at Puebla in 1941. There were more than 250,000 of these "agraristas" in Mexico in 1941

$20,000,000 since nationalization in 1938, suffered seriously in 1941 because of further wartime loss of markets and a $130,000 fire at the huge Minatitlán refinery in October which threatened to halt lubricating oil production for six months. The shortage of transport facilities was aggravated in April, Italy seized three tankers being built for Mexico in Genoa, but this was offset by the expropriation of axis tankers by Mexico. Five of these were put into Mexican service in June, and three more were scheduled for operation. In October, the petroleum administration moved to barter $18,000,000 in crude oil for United States oil-extracting and refinery equipment. The cost of re-equipping the industry was estimated, in December, at $15,000,000. Production and especially exports of petroleum fell off considerably during the year. In November, however, the controversy with United States companies whose properties were expropriated in 1938, and whose subsequent pressure on the Mexican industry had reduced its markets, reached a quasi settlement through diplomatic channels.

The mining industry, except for a boom in mercury, was not appreciably aided by war demands abroad, but agreements with the United States for the purchase of all surpluses of strategic minerals and of 6,000,000 oz. of silver monthly at 35 cents an ounce, heartened this branch of Mexican economy.

The financial situation was aided by the repatriation of some 200,000,000 pesos during the first four months of the new administration, but this trend diminished in the spring when it became apparent that the president would not swing sharply to the right. Bank deposits continued to increase until December, when some 2,000,000 pesos of axis funds in Mexico were frozen. Spanish and French residents, the largest and richest foreign group in Mexico, created a run on the banks, leading to the withdrawal of about $6,000,000. An agreement with the United States

in November for a $40,000,000 loan to stabilize the peso, however, strengthened the financial structure immeasurably.

Mexican industry dependent upon United States shipments of machinery suffered acute shortages because of U.S. priority restrictions, but actual closing of plants was avoided. In December shortages of such vital materials as tin-plate, aluminum, iron, steel and wool resulted in export control of those commodities. Previously Mexico had exported iron ore to Canada on an unprecedented scale. The volume of production during the first eight months of 1941 was slightly lower than in the same period of 1940. Mining, petroleum and electric power indices (basis: 1929=100) slumped from 82·1 to 81·7, 94·8 to 93·8 and 155·5 to 153·5, respectively.

The cost of living, particularly in the federal district, after rising 57·5% since 1934, continued around that level through Sept. 1941, and then jumped to 76% over the 1934 monthly average.

The tragedy of the year was the earthquake of April 15, which rocked central Mexico from coast to coast. Official estimates revealed 90 dead, 300 wounded and 50,000 homeless as a result. At Colima, worst hit, 90% of the houses were destroyed. Property damage amounted to $2,000,000, of which $800,000 was in Mexico City alone.

Foreign Affairs.—Foreign relations during 1941 were marked by close collaboration with the United States in hemisphere defense, resumption of diplomatic relations with Great Britain, and severance of relations with the axis powers.

A mutual assistance pact with the United States, in March, for reciprocal use of air bases, was followed in July by an agreement under which, for an 18-month period, Mexico prohibited the export of her commodities, directly or indirectly, to nations outside the western hemisphere, in return for which the United States undertook to purchase any resulting surpluses, capped by a comprehensive agreement on Nov. 19 for the settlement of all outstanding United States claims. Under this agreement the United States agreed to buy some $25,000,000 of Mexican silver a year, to make available $40,000,000 for currency stabilization, and to lend $10,000,000 annually for three years for Mexican road building. Mexico, on her part, in 15 annual instalments of $2,500,000, undertook to pay in full claims totalling $40,000,000 by putting up $3,000,000 on account. Within six months each country was to appoint one expert to determine the value of United States-owned oil properties in Mexico, expropriated in 1938. In the event five months of diplomatic negotiations should fail, this portion of the agreement was to be cancelled. Mexico was to pay $9,000,000 on these claims beforehand.

Relations with Great Britain, severed in 1938 during the oil expropriation crisis, were resumed in October, but no steps were taken to settle British claims.

Mexico recalled her minister to Germany for "consultation" in April. He did not return to his post. In June, Mexico officially condemned Germany's invasion of the U.S.S.R. as "one of the most tragic violations of international ethics recorded in history." Following strained relations over German indignation at Mexico's failure to protest against the United States black list of axis firms in Latin America, Mexico, in August, ordered German consulates to close and withdrew her own consuls from German-occupied Europe. Relations with Japan (Dec. 9) and Germany and Italy (Dec. 11) were formally severed, in a gesture of open support of the United States in its war against aggressor states. Similar action was taken against Bulgaria and Hungary on Dec. 23. Mexico did not declare war during the year.

Education.—Public education in Mexico is free, compulsory and completely divorced from religion. In 1941, there were 23,181 primary schools with 46,652 teachers and 2,037,870 students. Secondary school enrolment amounted to about 80,000. There were approximately 100 technical schools, including 30 vocational agricultural schools for Indians, and 91 federal schools for adult education, with 488 teachers and 8,760 students. The enrolment in Mexico's ten universities was approximately 30,000. Illiteracy (50% in 1930) was reduced to 45% in 1940 especially through rural education among the Indian population. Rural education is supported mainly by the federal government, urban instruction by the states and municipalities. In 1941, the federal budget for education was 77,850,000 pesos (1940: 73,800,000).

Defense.—The standing army was unofficially estimated in 1941 at 56,000 officers and men with 150,000 reserves. Plans to increase the reserves to 200,000 by compulsory military training were scheduled to go into effect in Jan. 1942. In 1940, the army had only four small tanks and the air force 90 planes and 700 men, but both were being steadily increased in 1941. Purchase of sea-patrol and fighter planes from the United States, in Nov. 1941, was expected to increase the air force to 300 planes by the end of the year. To defend the 3,000-mi. coast line, the navy had six escort vessels, ten coast guard craft and three patrol boats. Mexico's largest appropriations were for national defense (110,000,000 pesos in 1941; 94,025,000 pesos in 1940).

Finance.—The monetary unit is the peso (value: 20.70 cents U.S. Dec. 31, 1941). In 1941, the federal budget called for approximately 492,000,000 pesos, and receipts in the first half of the year were up some 36,278,000 pesos from estimates. Revenues in 1940 amounted to 515,200,000 pesos; expenditures, 523,700,000 pesos. At the end of 1941, metal reserves totalled 189,733,199 pesos; money in circulation 869,260,288 pesos (Sept. 1940: 618,468,000 pesos); and deposits in 137 banks (127 private, two foreign, and the National Bank of Mexico, with its branches, representing a combined capital of 307,352,000 pesos and resources of 1,816,993,000 pesos) 609,158,000 pesos, of which 523,000,000 were demand deposits. The national gold reserve was $31,000,000 U.S. in 1940. Banking is centralized under the National Bank of Mexico. Deposits in the Bank of Mexico and its associates amounted to 1,503,000,000 pesos in June 1941.

Trade.—Foreign trade in 1940 totalled 1,629,000,000 pesos, up 5.5% from 1939. In 1941, for the first time in the 20th century, imports exceeded exports by the substantial margin of some 120,000,000 pesos during the first eight months, as trade concentrated increasingly with the United States.

Exports in 1940 totalled 960,000,000 pesos (5% over 1939), with mineral products, chiefly silver, gold, lead, zinc, copper and petroleum, comprising approximately 70%. The United States took 89.4%, Japan 2.5% and Italy 2.3%. In the first eight months of 1941, exports dropped more than 35%, mainly because of decreased petroleum shipments to Europe after May 1940, and greatly reduced consignments of gold to the United States in 1941.

Imports in 1940 were 669,000,000 pesos (6.2% above 1939), with automobiles, rayon yarn, machinery and other manufactures the main commodities. The United States supplied 78.8% of the imports in 1940, Great Britain 3.2% and Japan 2.6%. In the first eight months of 1941, imports rose almost 29%.

Communication.—External communications are by steamship service, especially through Veracruz; by three main railways to the United States and one to Guatemala; by increasingly important air service north and south and to the West Indies; and by highway, notably through Nuevo Laredo to the north.

There were 24,363 km. of railway in 1941 (more than 50% government-owned) and approximately 56,000 km. of improved highway (including 7,200 km. paved). Work on the 1,900 km. route from Mexico City to the United States border at Nogales, Arizona, via Guadalajara, and on the southern sector of the Pan-American highway from Mexico City to the Guatemala border continued during 1941. A total of $23,000,000 was allotted for construction in 1942, covered in part by a $10,000,000 credit from the United States. Mexican civil air service carried 86,599 passengers in 1940, 3,460 tons of freight and 271,751 kg. of mail. Mexico had 103 licensed radio stations in 1940.

Agriculture.—Essentially an agricultural country, Mexico in 1941 had 120,417,760 ac. of cultivable land (one-fourth of its total area), but only 30,000,000 ac. were cultivated and only 5,700 ac. of a possible 90,000,000 ac. were under irrigation. Agricultural produce was valued at more than 700,000,000 pesos in 1939.

Principal Agricultural Products of Mexico

Crop	Output, tons (1940)	Area harvested, 1940 hectares (=2.471 ac.)	Value, pesos (1939)
Maize	1,680,503	3,302,181	206,437,000
Wheat	362,986	586,979	71,820,000
Cotton	62,440	249,880	70,467,000
Sugar cane	4,972,849	98,346	48,802,000
Henequen	124,973 (1939)	108,900 (1939)	36,614,000
Beans	96,752	635,447	34,905,000
Bahanas	370,643	34,738	23,105,000
Coffee	52,384	116,152	22,289,000
Alfalfa	1,719,084	40,455	22,037,000
Rice	106,589	52,438	14,061,000
Tomatoes	80,362	20,588	13,008,000
Chick-peas	65,561	99,849	11,025,000

Various fruits are also grown. Grazing lands in Mexico cover an area of 120,500,000 ac., with approximately 30,000,000 head of livestock in 1941, including cattle, horses, mules, donkeys, sheep, goats and pigs. There are 44,000,000 ac. of forests, of which 25,000,000 are estimated to be rich in pine, spruce, cedar, mahogany, rosewood and logwood.

Manufacturing.—In 1940, manufactured products were valued at 1,521,673,537 pesos, with 11,974 industrial establishments capitalized at 872,119,997 pesos. The chief manufactured products, with 1940 values, were as follows: refined petroleum products (243,070,899 pesos), cotton thread and cloth (216,154,000), wheat flour (97,335,000), cigars and cigarettes (71,487,000), iron and steel products (65,507,000), refined sugar (62,694,000), woollen thread and cloth (40,126,000), vegetable oils (38,506,-

000), soap (38,223,000), paper (32,641,000). The index of industrial values (basis: 1929=100) rose from 143.2 in Jan. 1941 to 194.3 in Aug. 1941.

Mineral Production.—Mexico's money economy is based on mining. In 1940 metallic production was valued at 645,067,000 pesos. In world production, Mexico ranked first in silver, second in lead and fourth in gold in 1941. Silver production in 1940 was 2,570,394 kg. (1939: 2,359,839 kg.), increasing 2.3% in the first half of 1941. The principal metals mined, with 1940 volume (value in pesos in parentheses) are: gold, 27,468 kg. (164,481,000); silver, 2,570,394 kg. (157,223,000); lead, 196,252 tons (122,609,000); zinc, 114,955 tons (91,110,000); copper, 37,600 tons (51,510,000); antimony, 12,268 tons (20,757,000); mercury, 401,715 kg. (10,929,000); cadmium, 814 tons (8,291,000); iron, 68,163 tons (3,772,000); white arsenic, 9,266 tons (1,165,000); others, 547,646 tons (10,876,000). Coal production in 1940 was 547,646 tons. Holding sixth place in world petroleum production, Mexico's 1941 output was estimated at 40,380,000 bbl. (1940: 41,876,000 bbl.).

Other Resources.—Other important resources are fishing on the west coast and the increasingly important tourist trade, mostly from the United States. In 1940, a total of 130,170 tourists entered Mexico (1939: 136,477), 61,450 reaching Mexico City (1939: 50,263) and spending 61,160,300 pesos (1939: 50,199,700 pesos). In 1941, an estimated 200,000 tourists spent almost 70,000,000 pesos in Mexico. (*See* also HISPANIC AMERICA AND WORLD WAR II; INTERNATIONAL LAW; PETROLEUM; UNITED STATES.)

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Mica. Sheet mica output in the United States in 1940 was 1,625,437 lb., an increase of 100% over 1939, but the value of the output, at $291,685, had increased 110%. The domestic output supplied only a small fraction of the needs, and imports included 6,122,731 lb. of scrap, 1,534,188 lb. of uncut sheet, 76,010 lb. of cut sheet, 7,386,397 lb. of splittings and 16,505 lb. of manufactured mica. Except for scrap, imports increased still further in 1941, but as preliminary data are not separated into the individual items, direct comparison is impossible. Imports of scrap and uncut sheet combined, which were 7,656,919 lb. in 1940, had dropped to 2,584,010 lb. in the first eight months of 1941; while this is apparently a heavy drop, since the value increased from $599,176 in 1940 to $617,332, the decline must have been confined to the cheaper scrap, while the more expensive sheet mica increased. In like fashion, the total of cut sheet and splittings combined was 7,482,407 lb., valued at $1,865,565, in 1940, while in the eight months of 1941 the weight reported was 6,596,040 lb., but the value was only $781,467, indicating that the relative proportion of splittings in the combination had been increased materially.

No current data could be secured on production and exports in India, the world's chief source of supply, but such information as was received seemed to indicate progress, demand from such countries as were accessible for export having compensated for the loss of those to which exports were prohibited. Great Britain and the United States presumably were getting the major portion of the exports. (G. A. Ro.)

Michigan. One of the north central group of states, Michigan was the 26th state admitted to the union; it is popularly known as the "Wolverine state." Area, 97,940 sq.mi. (including 39,960 sq.mi. of Great Lakes' water surface); pop. (1940) 5,256,106; (estimate Jan. 1, 1942) 5,315,000. Of the state's population in 1940, 3,454,867 were urban, or 65.7%; 1,801,239, or 34.3% were rural. Whites comprised 95.892% of the population, nonwhites 4.108% (215,934). Of the whites, 81.93% were native-born, 18.07% foreign-born. Capital, Lansing (78,753). Larger cities were Detroit (1,623,452); Grand Rapids (164,292); Flint (151,543); Saginaw (82,794).

History.—On Jan. 1, Murray D. Van Wagoner, Democrat, succeeded 81-year-old Luren D. Dickinson, Republican, as governor of Michigan. The new legislature was dominantly Republican; considerable interest was aroused, therefore, in the fate of 58 appointments which the retiring Gov. Dickinson had submitted to the incoming senate. At first it appeared that the senate would confirm the rival appointments made by the incoming governor. In nine instances, however, the Republican senate chose to confirm Dickinson appointees; in October the state supreme court, by refusing—in a four-to-four vote along strictly party lines—to issue an order requiring one of the Dickinson appointees to show cause why he stayed in office, endorsed, in effect, the nine appointments of the former governor.

The legislature, convening in its 61st session, proved to be an active one. A deadlock occurred, however, when the Republicans discovered, as they were preparing to adjourn in July, that they could not muster the necessary two-thirds vote to override any of 33 vetoes of the Democratic governor. The legislature then recessed for three months. When it reconvened in October, peace was negotiated with the governor, the Republicans being allowed to override 11 appropriation vetoes while the governor got his way on all policy-making vetoes. Included in the work of the legislature were laws providing for the consolidation of most of the revenue-collecting departments, re-enacting regulations for milk-price fixing, implementing new constitutional amendments to provide "clean election" machinery to prevent fraud in invoking the initiative and referendum, liberalizing the Michigan unemployment compensation act and making industrial sabotage a felony. The legislature failed in a vigorous attempt to override the governor's veto of a law to prevent the consolidation of banks and the erection of banking chains.

In all, 382 laws were enacted. By the terms of the state constitution, unless acts are given immediate effect at the time they pass, the effective date is 90 days after adjournment. Of the laws passed, 116 were given immediate effect. When the legislature reconvened in October, and found itself hard pressed by various groups wanting immediate effect, it adopted a concurrent resolution giving immediate effect to 55 additional acts. Early in Jan. 1942, however, the state supreme court by a unanimous decision ruled that the legislature in taking this step had exceeded its constitutional authority. Accordingly, more than two-thirds of the laws passed by the legislature did not become effective until more than 12 months after its session had begun.

Among the more important governmental changes in 1941 was the inauguration of a new four-member civil service commission to supervise the broad merit system established by constitutional referendum in Nov. 1940. Widespread acclaim greeted Governor Van Wagoner's appointments to the commission: George J. Burke, Democrat, a pioneer in the cause of the merit system in Michigan, who became chairman; former Governor (1921–27) Alex J. Groesbeck, Republican; John C. Beukema, Republican, and William Palmer, Democrat. Before many months had passed, 16,987 of an estimated 18,000 state employes were under civil service.

According to the provision in the state constitution providing for consideration every 16 years as to whether a constitutional convention shall be held, such a decision must be made in Nov. 1942. Accordingly, Gov. Van Wagoner appointed a 35-member constitutional study commission, with Justice George E. Bushnell of the state supreme court as chairman, to advise the electorate as to what changes it would be desirable to make in the state constitution.

In the April elections, George E. Bushnell and Edward M. Sharpe were re-elected supreme court justices on a nonpartisan ballot; in an extremely close race for the office of regent of the university, Franklin M. Cook and Charles F. Hemans, Democratic incumbents, were defeated by Earl L. Burhans and Alfred B. Connable, Republicans. E. B. Elliott, Republican, was re-elected superintendent of public instruction; Wynand Wichers, Republican, was re-elected member of the state board of education.

Following the appointment in April of State Supreme Court Justice Thomas F. McAllister to be a judge of the United States circuit court of appeals, Gov. Van Wagoner filled the vacancy in the state supreme court by the appointment of former Attorney General (1937–39) Raymond W. Starr.

The year 1941 saw the beginning of a widespread program of "clean-up" in politics and government. When a trial of Frank D. McKay, Republican national committeeman, in federal court on a charge of using the mails to defraud, resulted in a divided jury, steps were taken by the United States government to conduct a new trial. Meanwhile in a state court, Duncan C. McCrea and Thomas C. Wilcox, former prosecutor and sheriff, respectively, of Wayne county, were convicted on charges of conspiracy to protect vice and gambling; while former mayor of Detroit (1937–39) Richard W. Reading and 14 others were convicted on charges of conspiracy to protect a $10,000,000 a year "numbers" racket.

In labour ranks in Michigan a momentous event occurred in June: the Ford Motor company, which had long vigorously opposed granting a union contract, agreed with the United Automobile Workers of C.I.O. to establish a union shop.

Education.—In 1939–40, elementary school enrolment (through 6th grade) in Michigan was 580,925, with 32,736 teachers; secondary school enrolment (7th through 12th grades) was 396,920, with 13,373 teachers. Enrolment for state institutions of higher learning and their teaching staffs (in parentheses) were as follows: University of Michigan, 13,011 (773); Michigan State college, 8,472 (436); Michigan College of Mining and Technology, 998 (73); Michigan State Normal college, 2,393 (187); Western Michigan College of Education, 3,068 (215); Central Michigan College of Education, 1,556 (99); Northern Michigan College of Education, 693 (57).

Public Welfare, Charities, Correction.—There was a general downward trend in the number of persons receiving direct state relief, from 172,170 in Jan. 1941 to 97,980 in November. For the first 11 months of 1941, the monthly average number of individuals aided, and the monthly average of assistance payments were as follows: direct relief, 127,696 ($932,242.82); old age assistance, 86,866 ($1,498,337.05); dependent children, 50,002 ($859,414.31); the blind, 1,240 ($29,847.73).

There were three state-supported penal institutions: the state prison of southern Michigan at Jackson, the state house of correction at Marquette, and the Michigan reformatory at Ionia; the total number of prison inmates in the state Dec. 31, 1940 was 7,419.

Communication.—In 1940, the state system of highways included: hard-surface road, 5,945 mi.; gravel road, 2,932 mi.; earth road, 77 mi.; miscellaneous, 288 mi. In the year ending June 30, 1940, disbursements of the state highway department for administration, maintenance and construction totalled $58,868,528.31. Figures for 1939 showed 7,338 mi. of railways in the state. Total number of airports in 1941 was 121.

Banking and Finance.—As of Sept. 24, 1941, there were 364 commercial banks, industrial banks and trust companies in Michigan, with total deposits of $880,000,000 and total resources of $1,003,800,000; 235 small loan companies under the supervision of the state banking department; and 176 credit unions chartered under state law.

Agriculture.—The total value of agricultural production in the season of 1940 was $148,737,000; the total acreage harvested was 7,847,000. Cash income from crops was $85,547,000; from livestock and livestock products, $1,091,000, and from government payments, $12,773,000. A drought in the spring and summer of 1941 proved damaging to crops, particularly oats, hay and corn.

Table I.—*Leading Agricultural Products of Michigan, 1940 and 1939*

Crop	1940	1939
Corn, bu.	49,856,000	58,830,000
Wheat, bu.	17,812,000	15,784,000
Oats, bu.	60,489,000	42,712,000
Barley, bu.	5,796,000	5,771,000
Rye, bu.	1,260,000	1,512,000
Potatoes, bu.	20,640,000	24,250,000

Manufacturing.—Total estimated value of manufactures in 1939 was $4,341,413,139; in 1937, $5,296,100,960; in 1935, $3,986,178,348. Total employment figures for 1939, including both wage earners and salaried employees, were 589,319, with a total of $964,491,813 earned.

Table II.—*Principal Industries of Michigan, 1939 and 1937*

Industry	Value of products	
	1939	1937
Motor vehicles, not including motorcycles	$2,284,666,538	$1,613,225,661
Motor vehicle bodies and parts		1,313,376,621
Steel works and rolling mill products	.....	130,888,132
Foundry products	.....	114,463,371
Paper	135,162,620	92,418,197
Refrigerators, etc.	51,805,725	75,966,655
Hardware not elsewhere classified	.....	75,134,277

Mineral Production.—The total value of mineral production in Michigan for 1938 was $81,380,602; for 1939, $115,969,514. Considerable expansion took place in petroleum and natural gas industries.

Table III.—*Principal Mineral Products of Michigan, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Iron ore	$37,026,665	$13,139,823
Pig iron	18,872,150	9,806,994
Petroleum	21,350,000	10,300,000
Coke	12,408,881	10,135,722
Cement	10,891,078	8,767,859
Copper	9,148,880	9,161,628
Natural gas	7,411,000	6,387,000
Salt	6,726,912	6,151,154
Stone	5,890,728	4,059,590

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Michigan, University of.

Gifts of $500,000 each from the Rockefeller foundation and the W. K. Kellogg foundation made possible the organization of a new school of public health at the University of Michigan during 1940–41. It will be housed in a building, plans for which have been drawn, adjacent to the university hospital group. Dr. Henry F. Vaughan, formerly health commissioner of the city of Detroit, was appointed dean. The new school, the fourteenth of the schools and colleges composing the university, was officially inaugurated in the fall of 1941. Its curriculum is based on that of the former division of hygiene and public health, with important additions. In view of the national emergency the university appointed a central committee on national defense which counselled with students affected by the selective service law, organized an information service on public issues through lectures and other means, and arranged for instruction in subjects bearing on both military and civilian defense. A considerable number of staff members entered the national service as reserve officers or as research experts. Latin-American relations gave rise to numerous activities. Besides co-operating with the state department in welcoming visiting leaders from South America, the university arranged an English language centre for Latin-American students and special courses during the summer session for groups of students from Ecuador and Venezuela. One member of the faculty, Professor Arthur S. Aiton, lectured at the University of Costa Rica during the summer. (A. G. R.)

Midway Islands.

A group of two small islands and several sand islets of the Hawaiian group lying in longitude 177° 23′ W. and latitude 28° 13′ N., 1,149 mi. N.W. of Honolulu, possessions of the United States of America. Sand, the larger island, about 850 ac. in area, has a maximum height above sea level of 43 ft.; the smaller island, Eastern, about 328 ac. in area, is very low.

The islands are enclosed in a circular reef about five mi. in diameter, nearly four-fifths of which is above water. They are nonproductive, being little more than sand dunes, and have no native inhabitants. Sand Island is the site of a commercial cable station.

In 1859 Captain Brooks of the U.S.-owned Hawaiian bark "Gambier" discovered the group and took possession in the name of the United States. Formal possession was taken Aug. 28, 1867 by Capt. Reynolds of the U.S.S. "Lackawanna." An executive order dated Jan. 20, 1903, placed the islands under the control and jurisdiction of the U.S. navy department. Under licence from this department Pan American Airways established facilities on Midway for use in connection with its transpacific commercial airline. The 76th congress authorized the navy department to construct a seaplane base at Midway and appropriated approximately $5,000,000 for the purpose. Construction work on this base was in progress in 1941. (G. L. WF.)

Midway was attacked by Japanese naval and air units Dec. 7,

1941. For a number of days no word was received from the small group of U.S. marines there, and the islands were believed lost.

However, a message received Christmas day from Midway said, "We are still here, Merry Christmas."

By the end of the year, it was apparent that the garrison was still resisting.

Milk. All records for milk production in the United States were broken in 1941. The department of agriculture announced a total milk flow of 117,000,000,000 lb. for the year.

The previous high was 111,072,000,000 lb. in 1940. The five-year (1935–39) average annual production was 104,710,000,000 lb.

For 1942 the federal government called for still larger production, 125,000,000,000 lb., in order that there might be an ample supply of fluid milk and dairy products for home consumption and, in addition, still larger supplies of cheese and evaporated, condensed and dried milk to send to Britain under the lend-lease program of "Food for Freedom." From March 15, 1941, when the department of agriculture began its expanded purchase of agricultural products for Britain, to Dec. 1, 1941, the department bought for such export the following dairy products:

Dry skim milk	32,419,520 lb. at f.o.b. cost of	$ 3,127,841
Dry whole milk	2,575,500 lb. at f.o.b. cost of	737,534
Evaporated milk	13,570,430 cases at f.o.b. cost of	45,742,713
Cheese	137,566,710 lb. at f.o.b. cost of	31,544,071
Butter	65,787 lb. at f.o.b. cost of	20,508

Factors contributing to the heavy milk flow in 1941 were the larger number of milk cows on farms, the unusually mild fall weather, the larger number of cows freshening early in the fall and the liberal feeding of cows owing to high prices for milk and a favourable feed ratio. For example, grain and concentrates fed per milk cow per day, Dec. 1, 1941, in herds kept by dairy correspondents of the department of agriculture were 5.40 lb., the highest on record. The average of such daily feeding for the year was 4.85 lb.

Total milk production Dec. 1 was 8% higher than on the same date in 1940, and production per cow was 5% higher, the largest on record for that date. Milk production in the United States, the department of agriculture reported Dec. 15, 1941, was being pushed as fast as was practicable, but to supply Britain's requirements even more milk would have to be produced or home consumption curtailed. Nov. 1941 was the 16th successive month of increased sales of fluid milk, according to reports made by leading distributors in 152 U.S. markets to the Milk Industry foundation. This distribution was 7,183,228 qt. daily in Nov. 1941, compared with 6,943,035 qt. daily in Nov. 1940.

Widespread increases in milk prices occurred in October, owing partly to seasonal conditions and partly to the diversion of milk to cheese factories and condenseries.

In Chicago, where the retail delivery price was advanced to 15½ cents per quart, members of the city council proposed redefining the Chicago milk shed so that it would include only producers in Illinois, and none in Wisconsin and other states, and thus evade the federal interstate regulation of milk prices.

Two new developments in the milk industry were announced in 1941. The National Dairy Products corporation developed a new casein fibre, "Aralac," which the felt hat industry adopted as a substitute for foreign rabbit fur. A new system of zoning milk deliveries in Auckland, N.Z., reduced the mileage of milk trucks from 3,125 to 1,036 mi. per day, with a resultant saving in gasoline. (*See* also BUTTER; CHEESE; DAIRYING.) (S. O. R.)

Miller, Dayton C. (1866–1941), U.S. physicist and astronomer, was born March 13 at Strongsville, Ohio. After 1904 Dr. Miller conducted many experiments in an effort to determine whether the ether is carried along through space. In the summer of 1925, after making some 100,000 measurements in his special laboratory atop Mt. Wilson, Dr. Miller announced he had obtained evidence that there is an ether drift. The results of this investigation were then believed to have upset the famous Morley-Michelson experiment of 1887, upon which Einstein based his theory of relativity. In 1926 Dr. Miller won a $1,000 award from the American Association for the Advancement of Science for his theory of ether drift. Subsequent investigations tended to prove that Miller's experiments were inconclusive. A leading authority on acoustics, Dr. Miller had been preparing to consult with the U.S. army ordnance department on new range-finding equipment only a few days before he died in Cleveland, Ohio, Feb. 22. For his experiments, see *Encyclopædia Britannica.*

MILK DONATED by the American Red Cross arrived in unoccupied France in 1941. Here a French Red Cross nurse pours a glass for a baby in the slum section of Marseilles

Millstones: *see* ABRASIVES.

Mineral and Metal Prices and Production.

The first of the accompanying tables (page 436) gives data available by Jan. 1, 1942, on mineral and metal production during 1940 for the leading commodities and the more important producing countries. However, many of the figures are estimates, and others are lacking.

The *Statistical Summary* of the Imperial institute did not appear after 1938, and the data presented was collected from all available sources.

The *Mineral Industry* index of aggregate world mineral production rose in 1940 to a new high at 159, as compared with 152 in 1939, 139 in 1938, and the former high of 150 in 1937. The chief items contributing to the increase were, in order of magnitude, copper, petroleum, coal, aluminum, tin, tungsten, gold, diamonds and chromite.

The second accompanying table (page 437) shows the range of prices for leading metals and minerals during 1941 on the New York market and the opening and closing prices on the London market. Few prices advanced in any material degree, except those imported, for which freight and insurance rates increased. The *Engineering and Mining Journal* index of nonferrous metal prices rose from 82.48 in January to 84.32 in November, only June and August not showing increases.

In many cases the open market price was replaced by a controlled maximum, both in the United States and Great Britain. (G. A. Ro.)

Table I.—*World Mineral and Metal Production in 1940*

(Metric tons unless otherwise specified; Th. indicates thousands and Mi., millions of units.)

Country	Aluminum (Th.)	Bauxite (Th.)	Antimony (Th.)	Asbestos (Th.)	Cadmium (Th. Lb.)	Chromite (Th.)	Coal (Mi.)	Coke (Mi.)	Copper in Ore (Th.)	Copper (Blister) (Th.)	Diamonds (Th. carats)	Gold (Mi. Oz.)	Iron Ore (Mi.)	Pig Iron (Mi.)	Steel (Mi.)	Lead in Ore (Th.)	Lead (Th.)
Algeria	..	..	P	..	..	..	p	..	..	..	..	..	(2.75)	..	..	P	..
Angola	..	..	..	..	..	..	..	..	..	..	785	..	..	..	..	..	..
Australia	..	..	(0.2)	(0.3)	(376.3)	P	(17.3)	P	(20.2)	22	..	1.6	(2.62)	1.3	1.3	P	275
Belgian Congo	..	..	..	..	..	..	p	..	(121.5)	125	10900	(0.52)	p	p	..	..	..
Belgium	..	..	10.8	..	(1168.4)	..	25.6	(5.2)	..	P	..	..	P	2.2	2.2	..	55
Bolivia	..	..	..	..	..	..	..	..	6.7	..	..	..	..	..	..	11.7	..
Brazil	..	20	..	..	..	4.6	1.3	..	..	..	325	0.18	0.26	0.19	..	(14.1)	..
Burma	..	..	p	..	..	..	..	..	P	..	..	..	..	..	..	P	83
Canada	95	..	(0.6)	314.6	(939.7)	P	15.9	2.3	(281.5)	280	..	5.30	P	1.06	2.15	(176.3)	210
Chile	..	..	..	..	..	..	1.9	..	352.4	337.0	..	0.34	1.75	..	..	1.5	..
China	..	..	5.5	..	..	..	P	p	..	..	..	(0.27)	..	0.7	p	5	P
Colombia	..	..	..	..	..	..	P	..	..	..	..	0.63	..	..	..	..	..
Czechoslovakia	..	..	P	P	..	..	P	P	..	..	..	p	P	..	..	P	P
France	50	700	..	p	P	..	(51)	P	..	..	..	0.08	P	4.6	5.5	P	20
Germany	240	135	P	..	P	..	(434.0)	P	(30)	50	..	..	P	20.9	25.5	(96.0)	200
Gold Coast	..	..	..	..	P	(55)	..	..	..	..	825	..	..	..	..	..	..
Greece	..	180	..	..	..	..	(0.1)	..	..	..	..	..	(0.31)	..	..	P	P
Guiana, Brit.	..	550	..	..	..	..	..	..	..	..	26.8	0.04	..	..	..	..	..
Guiana, Neth.	..	615.4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hungary	2	560	..	..	..	..	(10.6)	P	..	..	..	..	(0.37)	0.4	0.7	..	p
India	..	P	p	..	..	(49.9)	28.2	(1.9)	(10.3)	8	..	(0.32)	(3.12)	2.02	..	..	..
Indo-China	..	..	p	..	..	..	2.5	p	..	..	..	..	0.03	..	..	..	p
Italy	36	380	P	P	P	..	3.1	P	..	(2.8)	..	..	P	0.9	2.5	P	35
Japanese Emp.	32	..	P	1	P	P	P	..	(77)	115	..	2	P	3.0	6.4	P	(22)
Luxembourg	..	..	..	..	..	..	..	..	..	..	..	..	P	1.1	1.3	..	15
Malaya	..	63.7	..	..	..	..	0.8	p	..	..	..	..	1.87	..	..	..	..
Manchoukuo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mexico	..	..	11.3	..	1798.4	..	0.5	P	40.8	34.4	..	0.88	0.11	0.07	..	196.3	195.1
Morocco, Fr.	..	..	P	..	..	..	(0.1)	..	..	..	..	..	P	..	..	(17.1)	..
Neth. E. Indies	..	274.3	..	..	..	..	1.9	..	..	..	..	..	..	..	..	..	..
New Caledonia	..	..	..	..	..	55.8	..	p	..	..	..	..	0.18	..	..	..	..
Norway	20	..	..	..	(204.2)	P	..	..	(19.4)	8	..	..	P	(0.2)	..	p	p
Peru	..	..	0.8	..	..	..	0.1	p	36.9	33.5	..	0.3	..	..	..	46.3	37.1
Philippines	..	..	..	..	..	194.4	p	P	9.1	..	..	..	1.19	..	..	..	..
Poland	..	..	..	..	P	..	P	..	..	..	..	..	P	..	..	(5.3)	P
Portugal	..	..	P	..	..	..	0.4	..	..	..	..	..	p	..	..	..	(0.8)
Rhodesia, No.	..	..	..	..	..	..	..	..	(216.0)	230	..	..	p	..	..	(3.0)	(2.8)
Rhodesia, So.	..	..	p	(52.9)	..	(139.1)	(1.1)	p	..	..	..	0.83	..	..	..	..	..
Siam (Thailand)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	..	..	..	..	..	(10.8)	..	..	..	..	600	..	P	..	..	..	..
South Africa	..	..	p	20.1	..	163.6	17.2	(0.2)	(11.0)	(10.3)	523.4	..	0.64	0.30	0.4	..	..
So.-West Africa	..	..	..	..	71.0	..	..	..	..	..	30.0	14.05	(0.02)	..	..	..	0.7
Sweden	2	..	..	..	..	..	0.4	0.1	(10.5)	(11.3)	..	0.22	(13.79)	0.6	0.9	..	..
Tunisia	..	..	..	..	..	..	..	..	..	..	..	..	(0.76)	..	..	..	..
Turkey	..	..	(0.5)	(0.1)	..	110.0	2.9	p	(4.6)	(5.9)	..	..	(0.24)	..	..	P	..
United Kingdom	32	..	..	..	..	..	(236.7)	P	..	5	..	..	P	8.5	13.6	P	10
United States	187.6	446.0	..	18.2	6886.0	2.7	457.9	51.8	809.5	978.9	..	5.92	74.88	43.03	60.8	412.2	468.7
U.S.S.R.	..	270	0.4	P	P	P	P	(16.7)	(107)	115	..	5	P	15.7	19.8	P	75
Venezuela	..	..	..	..	..	..	p	..	..	..	..	0.15	..	..	..	..	..
Yugoslavia	..	260	(3.3)	..	..	(59.5)	(6.1)	..	43.0	(41.7)	..	0.07	(0.67)	p	..	68.8	(10.6)
World Total	785	4,500	?	?	?	1,250	?	?	(2162)	2338	14140	16.83	200	106	146	?	1773

Country	Magnesite (Th.)[1]	Manganese Ore (Th.)	Mercury (Th. Lb.)	Nickel (Th.)	Petroleum (Mi. Bbl.)	Phosphate Rock (Mi.)	Platinum (Th.Oz.)	Potash (Th.)[2]	Pyrite (Th.)	Salt (Mi.)	Silver (Mi. Oz.)	Sulphur (Th.)[3]	Tin in Ore (Th.)	Tin (Th.)	Tungsten Ore (Th.)[4]	Zinc in Ore (Th.)	Zinc (Th.)
Algeria	..	..	..	..	..	350	..	..	P	P	(0.08)	..	..	..	..	P	..
Angola	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Australia	19.8	p	(0.2)	..	..	p	p	p	(55.1)	p	(15)	..	3.56	(3.3)	..	P	85
Belgian Congo	..	P	..	..	..	..	..	..	..	p	(2.09)	..	12.59	(2.5)	..	P	..
Belgium	..	..	..	..	..	(34.0)	..	..	..	..	..	..	..	(3.1)	..	P	65
Bolivia	..	(0.5)	(0.7)	..	..	..	..	..	..	..	5.63	4.1	38.55	..	4.18	P	..
Brazil	..	211.4	..	p	..	..	..	..	..	(0.50)	..	..	..	..	..	..	..
Burma	..	..	..	(0.9)	8.0	..	..	..	..	p	(6.18)	..	5.59	..	9	P	..
Canada	..	p	(0.5)	102.6	8.8	0.3	(148.9)	..	(206.5)	0.42	23.82	..	..	..	..	P	180
Chile	..	(12.6)	..	..	..	15	..	..	..	P	1.69	(27.0)	..	..	..	..	..
China	..	p	4.8	..	..	8	..	p	..	3	(0.15)	..	6.45	(10.6)	14.5	P	..
Colombia	..	..	..	..	25.9	..	(39.1)	..	..	p	0.27	..	..	..	..	..	..
Czechoslovakia	74.7	..	P	..	0.1	..	..	..	..	P	(1)	..	..	..	..	..	..
France	..	..	..	..	0.5	(25.4)	..	581.8	P	P	(0.57)	p	..	..	..	..	35
Germany	439	p	P	P	4.5	P	..	1861	P	P	(7)	..	(0.30)	(3.7)	..	P	225
Gold Coast	..	(341.7)	..	(1.3)	..	..	..	..	..	..	..	..	..	..	..	..	..
Greece	168.2	(11.2)	..	..	..	..	..	..	217.2	P	(0.15)	p	..	..	..	P	..
Guiana, Brit.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Guiana, Neth.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hungary	..	P	..	..	0.7	..	..	..	..	..	..	..	..	..	..	..	..
India	26.0	(858.2)	..	..	2.3	p	..	4.0	..	(1.52)	(0.02)	..	..	..	..	..	..
Indo-China	..	..	..	..	..	(35.7)	..	..	..	0.16	..	..	1.59	..	0.39	P	(5.3)
Italy	6.2	P	51037.0	P	p	p	..	0.3	P	P	(0.88)	P	0.23	..	..	P	40
Japanese Emp.	..	P	P	..	2.6	(375)	p	..	..	P	(11)	P	(1.7)	(2)	2	P	60
Luxembourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaya	..	(32.0)	..	..	..	230	..	..	..	..	..	..	86.75	(81.53)	0.53	..	..
Manchoukuo	331	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mexico	..	p	8.9	..	44.1	..	..	..	..	P	82.64	p	2.9	..	0.11	109.0	40
Morocco, Fr.	..	P	..	p	..	700	..	..	..	p	0.3	..	p	..	p	P	..
Neth. E. Indies	..	(12.1)	..	(0.8)	60.8	..	..	..	..	(0.14)	(0.62)	(17.3)	45.28	(14.79)	..	..	..
New Caledonia	..	..	..	17.5	..	P	..	..	..	..	..	..	..	..	..	..	..
Norway	2.1	..	..	(1.1)	..	..	..	..	P	..	(0.3)	..	..	..	..	P	20
Peru	..	p	..	..	13.4	..	..	..	..	(0.04)	19	0.6	p	..	0.29	17	..
Philippines	..	58.0	..	..	..	p	..	..	..	p	..	..	..	..	..	..	..
Poland	..	..	..	..	3.9	(10)	..	109.3	P	P	p	..	..	..	..	P	120
Portugal	..	(0.2)	..	..	..	..	..	..	P	P	..	..	(1.51)	..	4.86	..	..
Rhodesia, No.	..	(3.0)	..	..	..	..	..	..	..	..	P	..	p	..	..	P	..
Rhodesia, So.	..	..	p	(0.5)	..	..	..	..	27.4	..	P	..	(0.46)	..	(0.27)	..	15
Siam (Thailand)	..	..	..	..	..	..	..	..	..	p	..	..	17.73	..	0.2	..	..
Sierra Leone	..	..	..	..	..	..	p	..	..	..	..	..	..	..	..	..	..
South Africa	2.6	412.1	..	(0.4)	..	p	47.4	..	36.7	P	1.29	..	0.5	..	0.11	..	..
So.-West Africa	..	..	..	..	..	..	..	..	..	p	0.46	..	0.14	..	p	..	..
Sweden	..	(5.9)	..	..	..	(6.3)	..	..	191.7	..	(1.12)	..	..	..	0.2	P	..
Tunisia	..	..	P	..	..	950	..	..	..	P	(0.06)	..	..	..	..	P	..
Turkey	0.8	(3.3)	2.7	..	..	..	..	..	..	P	(0.58)	(2.6)	..	..	..	P	..
United Kingdom	..	..	..	..	..	..	..	..	P	P	(0.07)	..	1.8	(38.8)	0.3	P	60
United States	302	40.8	2871.0	(0.5)	1351.8	4066.0	41.0	344.5	627.4	9.07	67.01	2732.1	0.04	..	4.83	603.3	630.7
U.S.S.R.	P	P	P	P	215.6	(1618)	P	P	..	P	7	..	..	..	..	P	85
Venezuela	..	..	..	..	186.8	..	..	..	..	(0.02)	..	..	..	..	..	..	..
Yugoslavia	39.3	5.7	..	..	..	p	..	..	128.0	(0.05)	(2.29)	..	..	..	..	P	6.0
World Total	?	?	?	(120)	2154.2	8500	?	?	?	?	273.69	?	241.6	(178.2)	44.6	?	1,732

NOTES: A figure in parentheses is for the preceding year, 1940 data not being available. A figure without decimals or with less than the normal number is an estimate. The letter "p" indicates a production unknown, smaller than the minimum base of the table, while "P" indicates an unknown output of greater size.

[1]Crude magnesite in 1938, except U. S. [2]K_2O equivalent of salts produced in 1938; except U. S. [3]Mainly crude sulphur, but includes some ore, where sulphur content is not reported; also includes some sulphur recovered from industrial gases, especially from the roasting of sulphide ores. [4]Concentrates with 60% WO_3.

Table II.—*Mineral and Metal Prices in 1941*

New York market as reported by *E&MJ Metal and Mineral Markets*							London market as reported by the *Metal Bulletin* and *Mining Magazine*							
Open	High	Low	Close	Average	Grade and Units		Grade	Units	Open £	Open s.	Open d.	Close £	Close s.	Close d.
17.00	17.00	15.00	15.00	16.500	99% (a)	Aluminum	98–99% *	Long ton	110	..	..	110	..	..
14.00	14.00	14.00	14.00	14.00	Domestic (a)	Antimony	Domestic, 99%	,,	85	..	..	120	..	..
16.00	16.50	16.00	16.50	..	Chinese (a)		Chinese	,,	90	..	..	..	nom.	..
3.5	4.0	3.5	4.0	..	White oxide (a)	Arsenic	Foreign, 99%	,,	30	..	..	33	10	..
1.25	1.25	1.25	1.25	..	Ton lots (b)	Bismuth	*	Pound	..	$1.25	..	..	6	3
80	90	80	90	88.413	Commercial sticks (a)	Cadmium		,,	..	5	1½	..	5	4
33.00	46.00	33.0	46.00	..	48% (c)	Chromium, Ore	48% Rhodesian	Long ton	8	12	6	8	12	6
89	89	89	89	..	97% (a)	Metal	98–99%	Pound	..	3	6½	..	3	9
11	13	11	13	..	4–6% C (d)	Ferro-alloy	4–8% C	Long ton	45	..	..	45	..	..
11.800	11.950	11.775	11.775	11.797	Domestic (a)	Copper	Fire refined 99.7%*	,,	61	..	..	61	..	..
10.200	11.450	10.100	11.200	10.901	Export (a)		Electrolytic *	,,	62	..	..	62	..	..
35.00	35.00	35.00	35.00	35.00	(e)	Gold	Official	Ounce	..	168	..	..	168	..
4.45	4.45	4.45	4.45	..	Lower Lake ports (c)	Iron, Ore	50% No. African	Long ton	..	nom.	..	..	nom.	..
23.50	23.50	23.50	23.50	23.50	Basic (c)	Pig	Basic	,,	6	0	6	6	0	6
64.54	68.64	64.54	68.64	..	80%, Joplin, Mo. (f)	Lead, Ore	80% R/C	,,	..	25	..	..	nom.	..
5.500	5.850	5.500	5.850	5.793	New York (a)	Metal	Foreign, soft *	,,	25	..	..	25	..	..
27	27	27	27	..	99.8% (a)	Magnesium	Ingots *	Pound	..	1	6	..	1	6
51	65	51	63	..	46% Brazilian (g)	Manganese, Ore	50–52%	Unit	..	1	2	..	1	2
120	120	120	120	..	78–82% (c)	Ferro-alloy		Long ton	18	10	..	18	10	..
165.50	202.50	165.50	200.60	185.023	(h)	Mercury		Flask	48	..	..	47	15	..
45	45	45	45	..	90% (i)	Molybdenum, Ore	85–90%	Unit	..	52	10	..	42	6
95	95	95	95	..	50–60% Mo. (d)	Ferro-alloy	70–75% *	Pound	..	6	..	..	6	0
35	35	35	35	..	Cathodes (a)	Nickel	Refined	Long ton	190	..	..	190	..	..
24.00	24.00	24.00	24.00	..	(e)	Palladium		Ounce	5	10	..	5	10	..
36.00	36.00	36.00	36.00	36.00	(e)	Platinum		,,	8	15	..	8	10	..
1.75	1.75	1.75	1.75	..	99.5% (b)	Selenium		Pound	..	$1.72	..	..	8	6
34.75	35.125	34.75	35.125	34.783	New York (j)	Silver	Official, spot	Ounce	..	..	23⅝	..	..	23½
1.75	1.75	1.75	1.75	..	(b)	Tellurium		Pound	..	7	..	..	7	..
50.100	53.125	50.100	52.000	52.018	Straits (a)	Tin	Standard	Long ton	256	15	..	..	nom.	..
23.75	26.50	23.50	26.50	..	Domestic (k)	Tungsten, Ore	65% *	Unit	..	50	..	..	50	..
26.00	26.00	24.00	24.00	..	Chinese (k)	Ferro-alloy	80–85% *	Pound	..	5	1	..	5	1
105	105	105	105	..	75–80% (d)	Vanadium, Ore	10–12% V_2O_5	Unit	..	nom.	..	..	nom.	..
27.5	27.5	27.5	27.5	..	(l)	Zinc, Ore	52% R/C	Long ton	..	nom.	..	..	nom.	..
48.00	55.28	48.00	55.28	..	60%, Joplin, Mo. (f)	Metal	G. O. B. *	,,	25	15	..	25	15	..
7.25	8.25	7.25	8.25	7.174	St. Louis (a)									

(a) Cents per pound. (b) Dollars per pound. (c) Dollars per long ton, c.i.f. Atlantic ports. (d) Cents per pound of primary metal content. (e) Dollars per fine ounce. (f) Dollars per short ton. (g) Cents per long ton unit, c.i.f. Atlantic ports. (h) Dollars per flask, 76 pounds. (i) Cents per pound of contained MoS_2. (j) Cents per fine ounce. (k) Dollars per short ton unit. (l) Cents per pound of V_2O_5 contained.
*Under price control.

Mineralogy. In spite of greatly disturbed international conditions, many significant contributions were made in 1941. These included the study on the relation of chemical composition, colour and refractive index of biotites, by Hall (*American Mineralogist*, January), Colorado cerite, by Hanson and Pearce (*ibid.*, February), types of colouring in minerals, by Kennard and Howell (*ibid.*, July), proxenes, by Hess (*ibid.*, September and October), the relative corrosion hardness of agate, synthetic corundum and other minerals, by Eppler (*Zentralblatt für Mineralogie, etc.*, Nos. 1 and 4), *Mineralogy 1888–1938*, by Kraus (Fiftieth Anniversary Volume of the Geological Society of America), and the fifteenth edition of Dana's *Manual of Mineralogy*, by Hurlbut (Wiley, New York.)

During the year Herbert P. Whitlock, curator of minerals at the American Museum of Natural History, New York, since 1918, retired from active service. Dr. Whitlock was largely instrumental in arranging the museum's excellent exhibition collection of minerals. He is the author of many scientific papers, and the mineral Whitlockite, a tricalcium phosphate, is named in his honour.

Gem Minerals.—The cutting of the Vargas diamond weighing 726.6 carats, found in Minas Geraes, Brazil, in July 1938, and subsequently purchased by Henry Winston, Inc., of New York city, was begun during the year 1941. This was the second large diamond to be cut in the United States, the other having been the Jonker diamond, which weighed 726 carats, found in Jan. 1934 near Pretoria.

On account of the greatly increased demand for diamonds for industrial purposes, a symposium on diamonds was conducted at the annual meeting of the Mineralogical Society of America in Boston. The production and supply of diamonds, the cutting of gem diamonds, the manufacture and the use of diamond wire-drawing dies in the national defense program, diamond-set tools, bonded diamond wheels and evaluation criteria were discussed. This was the first symposium covering the various uses of diamonds that had ever been held.

To further the dissemination of information concerning the use of diamonds in industry the *Goldsmith's Journal* (London) added a section, entitled "Industrial Diamond Review."

Since the invasion of the low countries and France, the importation of synthetic rubies and sapphires, and of watch jewels and bearings manufactured from them, was practically cut off. These materials are highly essential in the manufacture not only of watches but of precision electrical and physical apparatus. In 1941 the U.S. production of these synthetic gems was begun.

Although synthetic emeralds had been produced in Germany for a number of years, their first production in the U.S. was announced during 1941 by Caroll F. Chatham, a chemist in San Francisco.

The following were noteworthy publications of the year on gems: "The Diamond Industry," by Ball (*Jewelers' Circular-Keystone*), "Cutting of Diamonds for Industrial Purposes," by Kraus and Slawson (*American Mineralogist*, March), *Mining of Gems and Oriental Stones by American Indians*, by Ball (Bulletin 128, Bureau of American Ethnology, Smithsonian Institution), and *Practical Gemmology*, by Webster (N.A.G. Press, Ltd., London.)

Roebling Medal.—The fourth Roebling medal of the Mineralogical Society of America was awarded to Dr. Esper S. Larsen, Jr., at the annual meeting of the society at Boston, Dec. 29. Dr. Larsen, professor of petrography at Harvard university since 1923, made many valuable contributions to mineralogy, especially to the determination of nonopaque minerals by microscopic methods. (*See* also MINERAL AND METAL PRICES AND PRODUCTION.) (E. H. KR.)

Miniature Photography: *see* PHOTOGRAPHY.

Minnesota. A north central state of the United States, popularly known as the "Gopher state." Area, 84,068 sq.mi., of which 4,059 are water. Pop. (1940) 2,792,300. The rural population was 50.2% of the total. Capital, St. Paul (287,736). The only city in the state with a larger population was Minneapolis (492,370); Duluth had 101,065.

History.—During 1941 the state legislature adopted a broader child-welfare program, provided for the enlargement of the Gillette State Hospital for Crippled Children, improved the labour conciliation law, amended the unemployment compensation law, provided for paying rural credit losses, and liberalized the old-age assistance lien. Officers of the state in 1941 were: Governor, Harold E. Stassen; lieutenant governor, C. Elmer Anderson; secretary of state, Mike Holm; treasurer, Julius A. Schmahl; auditor, Stafford King; attorney general, J. A. A. Burnquist; chief justice, Henry M. Gallagher.

Education.—In 1940–41, Minnesota had 8,339 elementary, 661 secondary and 440 consolidated schools; also 13 junior colleges. Enrolment was 318,921 with 13,260 teachers in the elementary grades; 192,433 with 8,488 teachers in the secondary grades; 2,940 with 174 teachers in junior colleges; 11,157 in adult-education classes with 237 teachers; and 485 in teacher training departments with 34 teachers. The total public school expenditure for 1940–41 was $58,420,911. The University of Minnesota had a regular enrolment of 14,345 full-time students in the fall of 1941 and a faculty of 1,098 in all branches and sessions. It ranked second in the United States in enrolment. Six state teachers' colleges had an enrolment of 7,265 with 325 teachers. Minnesota's educational system numbered 13 colleges in addition to the state university.

Charities and Correction.—During the year ending June 30, 1941, $9,040,511 was spent on general relief, the average number of cases being 33,043.

At the end of 1941 the general relief load in the state was estimated as 38% lighter than at the end of 1940. The WPA employed 40,464 persons during 1941 on projects on which $42,795,120 was spent; $12,199,355 of this amount was contributed by sponsors. In the year ending June 30, 1941, $15,982,405 was spent for old-age assistance, the average number of recipients being 62,898. A total of $3,801,228 was spent on dependent children; this sum cared for an average of 9,194 families and 21,884 children.

Communication.—During 1940, $28,491,421 was spent on highways in the state. The highway mileage totalled 11,261 mi. at the end of 1941; railroad mileage for 1940 was 9,199 mi. About 2,000,000 tourists visited Minnesota in 1941, making the estimated $150,000,000 tourist trade the state's third most important industry.

Banking and Finance.—On July 1, 1941, there were 484 state banks, one mutual savings bank and four trust companies in Minnesota with deposits of $306,247,103; 186 national banks with deposits of $817,938,000 and resources of $905,473,000; 44 building and loan associations with resources of $34,489,126. The state revenue fund and expenditure for the year ending July 1, 1941, was as follows: receipts to June 30, 1941, $42,259,183; overdrawn July 1, 1940, $2,119,137; payments to June 30, 1941, $45,379,411; balance July 1, 1941, $658,184. The outstanding debt on June 30, 1941, was $118,982,774, a slight reduction from that of 1940.

Agriculture.—The total value of farm crops in 1940 was $252,080,000; the harvested acreage, 19,114,000; cash income from crops, $112,368,000; from livestock and livestock products, $270,164,000; and from government payments, $40,552,000. Minnesota had an unusually favourable agricultural year in 1941 with gross cash sales of products probably the largest in many years, and perhaps as great as for any year since World War I. The 1941 corn crop was the second largest produced in Minnesota. Cattle production continued to expand.

Table I.—*Leading Agricultural Products of Minnesota, 1941 and 1940*

Crop	1941 (est.)	1940
Barley, bu.	44,980,000	57,348,000
Rye, bu.	...	5,958,000
Flaxseed, bu.	14,858,000	16,695,000
Wheat, all, bu.	21,268,000	32,069,000
Corn, all, bu.	197,868,000	172,457,000
Oats, bu.	116,123,000	180,795,000
Tame hay, tons	5,672,000	4,702,000
Potatoes, bu.	18,204,000	23,750,000

Manufacturing.—Principal industries in 1939 were as follows: meat packing $198,124,044; flour and grain milling $67,437,432; butter making $78,029,290; making of bread and other bakery products $21,349,382; printing and publishing (newspaper and periodical) $21,964,698; liquor manufacturing (malt) $23,364,854.

Mineral Production.—The 1941 output of iron ore in Minnesota was estimated at close to 64,000,000 gross tons, with a value of about $221,000,000 as shipped from the state. The production of rock wool was begun in 1941 in Minnesota and a second plant was built.

Table II.—*Principal Mineral Products of Minnesota, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Iron ore	$118,947,068	$97,113,591
Coke	3,662,908	3,684,811
Stone	1,987,822	2,339,774
Sand and gravel	1,024,716	1,942,430

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(T. C. B.)

Minnesota, University of. An institution of higher education at Minneapolis, Minn. Collegiate enrolment at the university, which had more than doubled in the previous 20 years, experienced its first significant drop in 1941 since the 1932–35 decline. Fall quarter, 1941, figures showed a falling off of 10.5% from those of 1940–41, which were the highest in the institution's history, and ranked it again second among U.S. universities in regular collegiate enrolment. The net total enrolment for the year ended June 30, 1941 was 45,588, of whom 19,140 were women. Opened for use in the fall of 1941 was a new $350,000 field-crops building on the farm campus. National defense activities occupied an important place in the program of the university, and a number of staff members were granted leaves of absence to engage in various aspects of the defense effort. In many university laboratories staff members carried on special research studies under agreements entered into by the university with the National Research committee. A special program was begun during the spring quarter 1941 for men students subject to selection for army service. It consisted of examinations, tests, and corrective work in the areas of health, physical fitness and recreation; and was being continued on an expanded scale in 1941–42. On June 30, 1941 accessioned volumes in the library totalled 1,183,620. Walter C. Coffey, dean of the department of agriculture, became acting president upon the retirement June 30, 1941 of Guy Stanton Ford. (W. C. C.)

Minor, Robert (1884–), U.S. communist leader, was born July 15 in San Antonio, Tex. His father was a school teacher, lawyer and district judge, and his mother was a member of Gen. Sam Houston's family. Young Minor attended school only four years and in his teens worked as messenger boy, sign painter's apprentice and carpenter. For a time he was cartoonist on the *San Antonio Gazette* and the *St. Louis Post-Dispatch*. In 1907 he joined the Socialist party, dividing his time between cartooning and political activities. Later he was cartoonist for the *New York World*, then the socialist newspaper, the *New York Call*. In 1916–18 he was an organizer for the International Workers' Defense league, handling publicity in the Tom Mooney case. In 1918 he was a war correspondent in Russia. During 1924–26 he lectured for the Communist party and in 1928 became editor of the *Daily Worker*. He was Communist candidate for mayor of New York city in 1933, and for governor of New York in 1936. On Feb. 24, 1941 he was made acting secretary of the Communist party of the United States, replacing Earl Browder, who had been sentenced to four years in federal prison for passport fraud.

Minor League Baseball: *see* BASEBALL.
Mint, United States: *see* COINAGE.
Miquelon: *see* FRENCH COLONIAL EMPIRE.
Missions: *see* FOREIGN MISSIONS.

Mississippi, admitted as a state in 1817; popularly known as the "Bayou state"; area, 47,716 sq.mi.; population (U.S. census, 1940), 2,183,796; capital, Jackson, 62,107, largest city in the state. Of the state's population in 1940, 432,882 were urban, or 19.8%. In 1940 there were 1,106,327 whites; 1,074,578 Negroes; 2,174,917 native born; 8,879 foreign.

History.—The state of Mississippi votes solidly the Democratic ticket. In the presidential election of 1940 the following votes were cast: Democratic balloting 168,267, regular Republican, 2,814, Independent Republican, 4,549, Socialist, 193.

For 1940–44 principal officers of the state were: governor, Paul B. Johnson; lieutenant governor, Dennis Murphree; secretary of state, Walker Wood; attorney-general, Greek L. Rice; state tax collector, Carl N. Craig; state treasurer, Lewis S. May; superintendent of education, J. S. Vandiver; presiding officer of the state senate, Lieutenant Governor Dennis Murphree; presiding officer of the house of representatives of the state, Sam E. Lumpkin. The state senate has 49 members in addition to the presiding officer, the lieutenant governor. The house of representatives has 140 members. In the membership of the state legislature farmers predominate with a total of 67 in the two houses; lawyers, 59; teachers, 23; merchants, 9; insurance agents, 5; with 13 other occupations represented in the membership with from five to one member. All members of the legislature are members of the Democratic party.

Education.—The state maintains two systems of public schools, one for whites and one for Negroes, as required by the constitution. Consolidation of rural schools has been extensive since 1930, the rural schools of all 82 counties of the state having been to some extent consolidated.

Banking.—There were in 1941 in the state 183 state banks, including 24 branch banks and 18 branch offices, and 24 national banks, including one branch bank. Bank resources stood at $273,946,371.98 on Sept. 24, 1941, with deposits at $242,956,784.07.

Agriculture and Manufacturing.—Agriculture provided direct employment for 64.4% of the state's total population. Sixty-three and two-tenths per cent of the total land area of the state is used for agricultural purposes, there being 291,092 farms covering 19,156,058 ac. in 1941, with a crop output of $212,159,000, of which $119,140,250 was cotton and $29,550,912 was cotton-seed.

Table I.—*Leading Agricultural Products of Mississippi, 1941 and 1940*

Crop	1941	1940
Cotton, bales	1,445,000	1,250,000
Corn, bu.	47,753,000	40,544,000
Oats, bu.	5,725,000	3,770,000
Sweet potatoes, bu.	6,935,000	4,485,000
Sugar-cane syrup, gal.	2,856,000	1,744,000
Peanuts, lb.	15,515,000	13,500,000
Pecans, lb	5,089,000	2,717,000

Manufacturing in recent years has developed rapidly, particularly manufacturing having to do with the use of cotton and the use of wood products.

Mineral Production.—The total value of mineral production in Mississippi in 1939 was $5,192,156; in the preceding year it was $5,209,547.

Table II.—*Principal Mineral Products of Mississippi, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Natural gas	$3,300,000	$3,210,000
Sand and gravel	810,933	1,240,974
Clay products	761,686	605,311
Petroleum	94,000	..

(A. B. Bu.)

Missouri. A west north central state of the U.S.A., admitted to the union in 1821; popularly known as the "Show Me" state. Area, 69,270 sq.mi.; pop. (1940), 3,784,664 (51.8% urban). Capital, Jefferson City (24,268). Largest cities: St. Louis (816,048), Kansas City (399,178), St. Joseph (75,711), Springfield (61,238). Aliens (1940) numbered 42,049.

History.—The 61st session of the Missouri general assembly (Jan. 8–July 12, 1941) remained in session longer than any previous assembly. Controlled by the Democrats, it immediately launched an unconstitutional scheme to prevent the inauguration of Forrest C. Donnell (Republican), elected governor in 1940 by a 3,613 plurality; but on Feb. 26, as the result of a decision by the state supreme court, Donnell was inaugurated. Then the assembly, on petition of the unsuccessful Democratic candidate, Lawrence McDaniel, proceeded in a constitutional manner and ordered a recount of the gubernatorial vote. On May 21, with the recount about half finished and with Donnell's plurality considerably increased, the assembly, at McDaniel's request, dismissed the contest. The legislature also enacted laws establishing a state defense council, a secret ballot, and the control of congenital syphilis. In addition, it resolved to submit two constitutional amendments to the electorate in 1942: one to repeal the nonpartisan court amendment, and the other to increase the pay of members of the legislature.

The major state officers (1941), all Democrats except the Republican governor, were: Forrest C. Donnell, governor; Frank G. Harris, lieutenant governor; Dwight H. Brown, secretary of state; Forrest Smith, auditor; Wilson Bell, treasurer; Roy S. McKittrick, attorney general. Twenty-eight Democrats and six Republicans constituted the state senate; 85 Democrats and 65 Republicans, the house of representatives.

Education.—For the school year ending June 30, 1941, the public school system consisted of 9,252 elementary schools, with 505,362 pupils and 18,119 teachers; 999 secondary schools, with 196,678 pupils and 8,147 teachers; the University of Missouri, including the Missouri School of Mines and Metallurgy, with 6,977 students and 522 teachers; Lincoln university (Negro), with 638 students and 68 teachers; 5 state teachers' colleges, with 10,760 students and 389 teachers; schools for the deaf and blind; and a Negro vocational school.

Public Welfare, Charities.—For the year ending June 30, 1941, unemployment compensation totalled $5,970,203. The state employment service made 137,266 placements. WPA earnings amounted to $34,378,083; old-age assistance, $21,331,528; aid to dependent children, $4,134,779; general relief, $3,791,235; NYA, $2,171,316. In June 1941, 113,787 persons received old-age assistance; 57,395, general relief; 47,402, WPA earnings; 32,297, aid to dependent children; 14,874, NYA funds.

Communication.—On Dec. 31, 1940, Missouri had 116,693 mi. of highways, of which 15,869 mi. were state and 101,824 mi. rural. In 1940 railroad mileage totalled 7,042 mi.

Banking and Finance.—On Sept. 24, 1941, Missouri had 534 state banks, with deposits of $771,664,000 and resources (loans and investments) of $757,473,000, and 84 national banks, with deposits of $551,440,000 and resources (loans and investments) of $527,319,000. On June 30, 1941, there were 195 building, savings and loan associations, having total assets of $135,406,007.

The balance in the state treasury on Dec. 31, 1940, was $21,220,839.98; receipts for 1941, $115,281,595.73; disbursements for 1941, $111,425,600.09; balance in state treasury, Dec. 31, 1941, $25,076,835.62; total state bonded indebtedness, Dec. 31, 1941, $89,751,000.

Agriculture.—Missouri's 1941 crops, harvested from 12,303,000 ac., were valued at $232,420,000, a 29% increase over the value of 1940. Winter-killing made the winter wheat crop the second smallest since 1874. Floods, heat, drought and fall rains damaged other crops, especially corn and tame hay. In 1940 Missouri's cash income from crops and livestock was $277,006,000; federal government payments were $25,091,000.

Table I.—*Leading Agricultural Products of Missouri, 1941 and 1940*

Crop	Value, 1941	Value, 1940
Corn	$83,780,000	$74,426,000
Cotton (lint and seed)	51,416,000	21,847,000
Tame hay	31,666,000	23,212,000
Oats	19,587,000	15,285,000
Winter wheat	18,397,000	22,457,000

Manufacturing.—During 1939 Missouri's industries manufactured products valued at $1,388,056,267, employed 178,538 wage earners and 24,275 salaried persons and paid $190,735,851 in wages and $58,937,137 in salaries.

Table II.—*Principal Industries of Missouri, 1939 and 1937*

Industry	Value, 1939	Value, 1937
Meat packing (wholesale)	$107,254,213	$116,576,053
Footwear (except rubber)	100,346,106	103,253,379
Iron and steel (excluding machinery)	80,059,177	77,681,234
Wearing apparel	85,297,177	76,998,667
Malt liquors	41,412,301	34,272,016
Drugs, medicines	23,006,499	24,335,460

Mineral Production.—The value of Missouri's mineral production in 1939 was $45,619,104, a 15% increase over that of 1938. In 1940 the value continued to increase. Missouri's lead production in 1940 was 172,052 tons, 37.6% of the U.S. output.

Table III.—*Principal Mineral Products of Missouri, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Lead	$17,205,200	$14,690,114
Cement	Fig. not available	7,420,013
Bituminous coal	Fig. not available	6,124,000
Stone	6,170,867	4,589,986
Clay (raw and products)	Fig. not available	3,931,065
Lime	3,184,293	2,800,379
Barite	1,216,069	1,163,870

(R. P. Br.)

Mitchell, Charles Hamilton (1872–1941), Canadian general and educator, was born Feb. 18 in Petrolia, Canada. After receiving a civil engineering degree from the University of Toronto in 1898, he worked as a consulting engineer on many Canadian hydroelectric power projects and became a member of government water-power boards. He served overseas during the war of 1914–18, attained the rank of a brigadier general in the war office intelligence service and received the D.S.O., as well as honours from France, Belgium and Italy. From 1919 until his retirement shortly before his death, Gen. Mitchell was consulting engineer and dean of the faculty of applied science and engineering at the University of Toronto. He died in Toronto, Aug. 26.

Mochizuki, Keisuke (1867–1941), Japanese statesman, was born in March at Hiroshima-ken. He was elected 13 times to the lower house of the diet. He was minister of communications in 1927 and again in 1935. In 1928 he was appointed home minister. Chief whip for the Seiyukai party, he later was president of a minor political party. He died Jan. 1 in Tokyo.

Moelders, Werner (1913?–1941), German war pilot, top-ranking ace of Hitler's *Luftwaffe*, first gained combat experience in the Spanish civil war, (1936–39)

by flying for Franco in the German Condor legion. He was credited with destroying 12 loyalist craft. During World War II, Moelders was credited with shooting down 103 planes, bettering the record of Baron Richthofen, ace of World War I, who downed 80 allied planes. Moelders, who won many medals and had been personally cited by Hitler for bravery and heroism, met his death in the crash of a transport plane near Breslau, Nov. 22. He was returning from the funeral of Gen. Ernst Udet (*q.v.*).

Mohammedanism: *see* ISLAM.

Molasses: *see* SUGAR.

Molotov, Vyacheslav Mikhailovich

(1890–), Russian statesman, was educated at Petersburg polytechnic and during his youth organized bolshevik student groups and worked for the newspaper *Pravda*. February of 1917 found him a member of the Petrograd soviet executive committee. In 1920 he was appointed secretary of the central committee of the communist party of the Ukraine, and in the following year he held this office for the whole of the U.S.S.R. He was appointed president of the Soviet of People's Commissars in 1930 and was named foreign commissar May 3, 1939, to succeed Maxim Litvinov. The latter appointment foreshadowed the temporary shift in soviet foreign policy which led to the nazi-soviet pact of non-aggression, signed by Molotov in Moscow, Aug. 24, 1939. On the surface, German-Russian relations continued amicable during the next 20 months, especially after Molotov's visit to Berlin Nov. 12–13, 1940. But Hitler, in his war proclamation against the U.S.S.R. in 1941, revealed that he and Molotov had expressed widely divergent views on several subjects during their talks in Berlin the preceding November.

On May 6, 1941, Molotov resigned as premier of the U.S.S.R. and was succeeded in this office by Stalin (*q.v.*); he remained as foreign commissar, however, and took over the vice-premiership. Six hours after the German invasion started on June 22, Molotov broadcast his condemnation of the attack—"a perfidy unparalleled in the history of civilized nations"—and his prediction that the U.S.S.R. would administer a "crushing blow" to its enemy. On July 1 Stalin named him vice-chairman of the soviet defense committee, to which was delegated the full authority of state. On July 13 Molotov signed the British-U.S.S.R. mutual-aid pact in which each nation agreed not to make a separate peace. During the summer months he held a number of interviews with U.S. and British officials, among them Harry Hopkins and Lord Beaverbrook (*qq.v.*). In October Molotov moved the foreign office temporarily to Kuibyshev.

Molybdenum. World production of molybdenum contained in ores in 1940 recovered from the 1939 drop and somewhat exceeded the former high of 1938, with a total of 36,704,000 lb., of which 34,313,000 lb. was from the U.S. and 22,782,600 lb. was supplied by the Climax mine in Colorado. Total U.S. shipments during 1940 were 25,329,000 lb., leaving 8,984,000 lb. to add to stocks. Exports in 1940 were 6,585,000 lb., against an estimated 11,300,000 lb. in 1939, exports being restricted to Canada and Great Britain. Deducting exports from total shipments, it is to be noted that domestic consumption in the U.S. declined 11% in 1940, as compared with 1939. Production outside of the U.S. is limited to comparatively small amounts in Norway, Mexico, Peru and Morocco. Germany in 1941 had access to the Norwegian output, which approaches 1,000,000 lb. annually, and was reported to have installed a recovery plant in Greece. A new Russian plant for the recovery of molybdenum concentrates from copper ore was under construction in Kazakstan, but it was not known whether it had been put into operation. (G. A. Ro.)

Monaco. A principality on the Mediterranean coast, bounded on the land side by French (unoccupied) territory. Area 375 ac. (0·59 sq.mi.); pop. (1939), 23,973. Chief towns: Monaco, La Condamine, Monte Carlo; ruler: Prince Louis II; language: French. The chief occupation is catering for visitors, who, before the start of war in 1939, numbered more than 2,000,000 annually.

Monazite. Treatment of Florida beach sands was begun in 1940, for the recovery of rutile, ilmenite, zircon and monazite, but no data were available on production. Except for small outputs in 1915–17 and 1925, this was the first production of monazite in the United States since 1910. Most of the world output comes from India, Netherlands East Indies and Brazil, but no recent data are available. (G. A. Ro.)

Monetary Units of Leading Countries: *see* EXCHANGE CONTROL AND EXCHANGE RATES.

Mongolia (INNER AND OUTER). A vast, sparsely populated tableland in northeastern Asia, arid and desert in stretches, Mongolia occupies an area of about 1,000,000 sq.mi. It is bounded on the north by Siberia, east by Manchoukuo, west by Sin Kiang (Chinese Turkestan), south by China. Of these two parts of Mongolia, which were administratively separated in 1921, Outer Mongolia (622,744 sq.mi.) is larger in size; but Inner Mongolia (334,100 sq.mi.) is the more closely settled, as it has a certain amount of industry and agriculture, along with the grazing which is the general characteristic of all the Mongolian regions. Inner Mongolia was formerly organized in the Chinese provinces of Chahar, Suiyuan and Ningsia; but the Japanese, after their occupation of the country, set up three dependent regimes, in Suiyuan, in Tatung, major coal centre of north Shansi and in Kalgan, in Chahar.

Outer Mongolia.—Population in 1941 (estimated) 850,000. Capital, Ulan Bator (formerly Urga). This vast area has been almost completely isolated from the outside world, except from the soviet union, since 1921 when red army troops, pursuing the anti-bolshevik forces of Baron Ungern-Sternberg (subsequently captured and executed) across the Siberian frontier into Outer Mongolia, co-operated in setting up a so-called People's Revolutionary government which maintained the closest contact with the soviet regime in Moscow. Power is vested in a representative assembly, the Great Huruldan, which selects from its members the Little Huruldan, for more frequent sessions. The Little Huruldan, in turn, elects a committee of five, which is charged with the management of current affairs.

Most of the wealth of the Mongols has always consisted in their flocks and herds, and one estimate is that in Outer Mongolia there are 1,340,000 horses, 270,000 camels, 1,500,000 oxen and 10,600,000 sheep. Collectivist measures which were passed by local communists, in line with the general drive for collectivization of agriculture in the U.S.S.R., between 1929 and 1932 led to several uprisings and to a flight of some of the more conservative Mongols into Inner Mongolia. There was a subsequent mitigation of these measures. The vague and disputed boundary between Outer Mongolia and Manchoukuo led to a number of clashes, the most serious being in the neighbourhood of Lake Buir and of Nomonhan. The last developed into a serious pitched battle between Russian and Japanese troops in the summer of 1939.

Wool and bristles and casings are among the most important exports of Outer Mongolia. Trade is financed through the Mongo-

bank, in which the soviet state owns half the capital. The chief trading unit is the Mongo Central Co-operative society. There is an air service between Verkhne-Udinsk, in Siberia and Ulan Bator and a highway between Ulan Bator and the Siberian border town of Kyakhta. Northwest of Outer Mongolia is the little soviet protectorate of Tannu-Tuva, area 64,000 sq.mi., pop., 65,000, capital, Kysylchoto, with communication on the Yenisei river with Siberia.

Inner Mongolia.—Population in 1941, about 1,500,000. Capital, Suiyuan. The course of historical development has been very different from that of Outer Mongolia, and Japanese influence after 1937 was as paramount as Russian influence had been predominant in Outer Mongolia for a much longer period. Inner Mongolia during the '20s was a rough frontier region in which there was an uncertain balance of power between Chinese local war lords and Mongol tribal princes. The settlement of Chinese agricultural colonists from the more overcrowded regions of China was a profitable business, and there was a consequent clash of interest between the nomadic Mongol herdsman and the Chinese farmer, who wished to bring grazing land under the plow. Mongol princes were sometimes bribed to alienate tribal lands—a procedure that was contrary to Mongol custom. Japanese agents were able to exploit this situation and to stir up the Mongols against the Chinese, with the result that there was little Mongol opposition and even some co-operation when the Japanese carried out their military occupation of north China in 1937. Prince Teh, the strongest personality among the Mongol chieftains, who had hitherto endeavoured to preserve a precarious autonomy by playing off Chinese against Japanese, saw no alternative except to accept Japanese suzerainty, and he became head of a nominally independent Mongol regime, with headquarters at Suiyuan.

Unlike Outer Mongolia, Inner Mongolia contains important mineral resources, especially iron in Chahar and coal in the vicinity of Tatung; and the Japanese have attempted to exploit these mines with a view to creating their self-sufficient economic unit in east Asia. They have, however, been harassed and impeded by guerrilla warfare, in which some Mongols have participated along with the Chinese communist and nationalist forces.

Mongols, descendants of the warriors who fought under Jenghiz Khan (whose legendary grave is located in the wild Ordos region of Inner Mongolia) are scattered over a vast expanse of territory and are under many sovereignties. There are 1,500,000 or 2,000,000 in the provinces of Manchoukuo which lie to the west of the Hsingan mountains; and a smaller number are to be found in the Buryat-Mongol republic, one of the administrative subdivisions of soviet Siberia. A few are also in Sin Kiang. Their religion is Lamaism, a degenerate and superstitious form of Buddhism. As a general rule they prefer nomadic pastoral life and their homes are camps, not towns.

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(W. H. CH.)

Monivong, Sisowath (1875–1941), monarch of Cambodia, French Indo-China, was born Dec. 27. King Sisowath succeeded to the Cambodian throne after the death of his father in 1927, but he ruled in name only, as real authority was vested in the French colonial administration. Like his ancestors before him, Sisowath lived in the capital city of Pnom-Penh in a walled palace where he was served by several hundred wives. But the depression penetrated the jungles of Cambodia in 1937, and the king was forced to dismiss half of his 200 wives. In ill health and depressed over the Tokyo peace negotiations of early 1941, which awarded the northwest portion of his kingdom to Thailand (Siam), King Sisowath died in his palace, April 23.

Montana. A northwestern state of the United States, popularly known as the "Treasure state." Area, 147,138 sq.mi.; pop. (1940): 559,456. The urban population was 211,535 or 37·8%. Capital, Helena (15,056). Other cities of 10,000 or more were: Butte (37,081); Great Falls (29,928); Billings (23,261); Missoula (18,449); Anaconda (11,004). Of the total population there were 540,468 whites, of whom 484,826 were native-born and 55,642 were foreign-born. The Indian population numbered 16,841.

History.—Measures passed by the legislative assembly in 1941 provided for a survey for reorganization of the state government, the reapportionment of congressional districts, changes in the social security law, and proposed changes in the state board of education.

Sam G. Ford, elected in 1940, was the first Republican governor in 20 years. Other state officials in 1941 were Ernest T. Eaton, lieutenant governor; Sam Mitchell, secretary of state; John J. Holmes, auditor; John W. Bonnor, attorney general; Elizabeth Ireland, superintendent of public instruction.

Education.—There were some 1,890 elementary schools in Montana in 1941, with an enrolment of 75,000 pupils and a teaching staff of 3,830. There were 199 high schools with an enrolment of 32,000 and 1,531 teachers. The total cost of operating these schools was approximately $15,100,000. The six units of the University of Montana had a registration of 5,252 and a teaching staff of 337, exclusive of the extension service.

Public Welfare, Charities, Correction.—Through federal and state aid, more than 26,000 persons in Montana received public assistance in 1941. Grants totalling almost $5,000,000 were distributed in 1941 as follows (figures in parentheses indicate the average number of recipients per month): Old-age assistance (12,413), $3,043,704.37; aid to dependent children (6,352), $920,991.72; aid to needy blind (263), $70,129.95; general relief (3,258), $597,208.07; medical care (874), $74,370.55; hospitalization (485), $205,935.47; burials (62), $40,303.03. Unemployment compensation benefits totalling $2,535,498 were paid to 18,373 persons, an average of $11 per month for 12.5 weeks, or $138 per claimant. Correctional institutions with their average population and total expenditures in 1941 were: Montana State prison, 508 inmates, $182,900; State Industrial school, 135 inmates, $71,729; Vocational School for Girls, 89 inmates, $48,247.

Communication.—In 1940 the state highway commission maintained 6,395 mi. of highways at a cost of $12,117,000. The railway mileage was 5,203. Three air lines served the state in 1941 and there were 20 airports and 23 emergency landing fields, including those used by the forest service.

Banking and Finance.—There were 112 banks in the state in 1941. The 42 national banks had total deposits of $90,664,704 and their total assets were $99,538,000. State banks had total assets of $86,415,362 and their deposits were $45,159,352. There were 20 savings and loan associations, with resources of $12,400,000. For the fiscal year 1940–41, the state income was $36,692,605 and the total expenditures were $37,212,366. The gross debt of the state was $9,128,725 and the net debt, $8,288,851.

Agriculture.—Favourable weather conditions and higher prices made the year 1941 the best since 1927 for Montana farmers. Crops worth $103,465,000 were harvested from 6,526,000 ac. The cash income from livestock and livestock products was $71,916,000. Government payments were $11,619,697.

Table I.—*Leading Agricultural Products of Montana, 1941 and 1940*

Crop	1941	1940
Wheat, bu.	68,239,000	51,676,000
Hay, tons	2,318,000	2,160,000
Oats, bu.	14,544,000	10,574,000
Sugar beets, tons	810,000	1,166,000
Barley, bu.	5,656,000	4,208,000
Corn, bu.	3,560,000	2,856,000
Alfalfa seed, bu.	117,000	185,000
Flaxseed, bu.	888,000	770,000
Potatoes, bu.	1,540,000	1,840,000
Seed peas, bu.	567,000	414,000

Manufacturing.—The total value of products manufactured in Montana in 1939 was $151,885,026 as compared with $176,278,814 in 1937. Persons employed in manufacturing numbered 10,898 in 1939 and were paid salaries and wages amounting to $15,832,241.

Table II.—*Principal Industries of Montana, 1939 and 1937*

Industry	Value of products	
	1939	1937
Bread and bakery products	$ 4,020,290	$ 3,733,316
Butter	4,248,762	4,130,181
Flour and other grain mill products	6,254,698	8,146,527
Liquors, malt	2,091,234	2,093,570
Lumber and timber products	7,587,327	9,922,709
Meat packing, wholesale	4,731,406	4,036,095
Petroleum refining	13,461,015	10,892,921
Sugar, beet	10,780,455	9,389,256
Printing and publishing	3,196,483	3,362,550

Mineral Production.—The 1941 production of gold, silver, copper, lead and zinc in Montana was valued at $57,433,700, an increase of 3% over that of 1940. The lead output was less than in 1940, but owing to the higher price its value was greater.

Table III.—*Principal Mineral Products of Montana, 1941 and 1940*

Mineral	Value, 1941	Value, 1940
Copper	$20,835,000	$28,564,366
Gold	8,627,500	9,541,070
Silver	8,038,400	8,790,080
Zinc	8,496,800	6,625,962
Lead	2,436,000	2,303,600
	Amount in 1940	Amount in 1939
Coal	2,974,000 tons	2,810,000 tons
Petroleum	6,768,000 bbl.	5,961,000 bbl.

Crude oil production amounted to 7,432,354 bbl. in 1941 as compared with 6,768,000 bbl. in 1940. (E. E. B.)

Montenegro. A former kingdom in the northwest Balkan peninsula, Montenegro had voted on Nov. 25, 1918 its union with Serbia in the then newly formed kingdom of the Serbs, Croats and Slovenes or Yugoslavia. At that time its area was 5,880 sq.mi. with a population est. on Jan. 1, 1917 at 436,789, all of them Serbs of the Greek Orthodox religion. The capital was Cetinje. The last king was Nicholas I, whose daughter married King Victor Emmanuel III of Italy. The occupation of the people is mainly pastoral and agricultural. As a province within Yugoslavia, Montenegro, according to the census of Jan. 1921, had an area of 3,733 sq.mi. and a population of 199,856; the density of the population was the smallest in the whole of Yugoslavia. With the redistribution of Yugoslav administration in 1930, Cetinje became the capital of the Zetska banovina or province. The population of Cetinje according to the census of March 31, 1931 was 6,367.

With the disintegration of Yugoslavia under German aggression in April 1941, the fate of Montenegro remained for a long time undetermined. The territory came under Italian military occupation, and in April Sarafino Mazzolini, former Italian minister to Egypt, was named royal Italian commissioner to Montenegro. On July 12 a constituent national assembly met at Cetinje and proclaimed the independence of the country, declaring that "the regime is abolished which was introduced in Montenegro by the former kingdom of Yugoslavia." Owing to the lack of a chief of the state, it was decided to establish a regency, and to ask the king of Italy to appoint a regent. On Oct. 27 a treaty fixing the borders between Croatia and Montenegro was signed in Zagreb by Italian and Croat officials, declaring that the border should follow roughly the ancient frontier of 1918 between Austria-Hungary on the one hand and Montenegro and Serbia on the other hand. Mount Kliunack-Glava was named as the point where the borders of Montenegro, Croatia and Serbia meet. Montenegro has only a very limited outlet to the sea, the larger part of the Montenegrin shore having been directly incorporated into Italy. (*See* also CROATIA; DALMATIA; YUGOSLAVIA.) (H. Ko.)

Montreal. A city of Canada, in the province of Quebec, situated on an island at the confluence of the Ottawa and St. Lawrence rivers, approximately 1,000 mi. from the Atlantic ocean and 2,760 mi. from Liverpool. It is at the head of ocean navigation and is the terminus of lake vessels. It is served by three canal systems: the St. Lawrence canals (1,230 mi. to the Great Lakes), the eastern United States canals, via the Richelieu river and Lake Champlain (127 mi.) and the Ottawa river canals (119 mi.). The head offices of the Canadian Pacific railway and of the Canadian National railways are situated at Montreal.

Population of the city of Montreal (census of 1931) was 810,925; of greater Montreal, including its suburbs, 973,637. In 1941, as estimated by Lovell's *Directory*, the population was: city of Montreal, 1,307,592; greater Montreal, 1,493,132. Greater Montreal is governed by a metropolitan commission, the majority of whose members are appointed by the city council, composed of 99 members.

The mayor is elected by the electors of the whole city. He is not a member of the executive committee, and is paid for his services as mayor. The council appoints from among its members six councillors to act as an executive committee.

The port of Montreal is the largest in Canada. War conditions accelerated its activity in 1941, but statistics were unavailable because of censorship.

For 1941 the amount of building permits issued stood at (new) 1,105, value $9,193,281; (repairs) 2,523, value $3,354,001. Bank deposits (for 11 months ended Nov. 30, 1941) $8,926,762,706, and bank clearings (for 12 months ended Dec. 31, 1941) $5,871,146,000. The assessed value of real estate was $1,255,702,054. (J. A. MA.)

Montserrat: *see* WEST INDIES, BRITISH.

Moran, (John) Léon (1864–1941), U.S. artist, son of Edward Moran (1829–1901), famous U.S. marine painter, was born Oct. 4 in Philadelphia, Pa. He studied art with his father and later attended the National Academy of Design in New York and art schools in London and Paris. In 1904 he won the gold medal of the American Art society in Philadelphia and later won the gold medal of the Philadelphia Art club. He died in Plainfield, N.J., Aug. 4.

Moravia: *see* BOHEMIA AND MORAVIA.

Morgan, Helen (1900?–1941), U.S. "blues" singer of radio, screen and stage, was born in Danville, Ill. After working in a biscuit factory and as a manicurist, she got a job in a Chicago cabaret, where she was discovered by a Ziegfeld talent scout who put her to work in the chorus of *Sally* in 1920. In 1923 she won a Canadian beauty contest and in 1927 she made her first hit in Ziegfeld's *Show Boat*. From then on, her star rose swiftly in the entertainment world. She specialized in singing "blues" songs while sitting on a piano, a stunt that attracted wide attention and won her many stage and vaudeville bookings. Miss Morgan died in Chicago, Oct. 8.

Mormons. The church intensified, during the year 1941, its welfare program. Budgets of production were issued for the year 1942, based upon surveys as to the probable number of persons, employables and unemployables, aged and infirm, who might need assistance in 1942–43. The interexchange of commodities between different sections of the church was intensified and perfected, so that, for example, salmon from Oregon was exchanged for citrus fruits from Arizona; and so for other commodities.

During the year the church carried on an extensive building program of chapels and amusement halls, not alone in the thickly populated areas of the church, but in the mission fields where a number of good, but modest meetinghouses were built. Work was pushed forward on the Temple at Idaho Falls, Ida., which it was planned to complete during the year 1942.

The increasing work of supervising the stakes and missions of the church made necessary the appointing of five assistants to the Council of the Twelve Apostles. These men were appointed for life. The immediate work given to them had to do with the welfare program and with the building up of the priesthood organizations of the church. Every male member of the church

over 12 years of age holds some rank of the priesthood, which has two general divisions: the Aaronic, or Lesser Priesthood, filled normally by boys from 12 to 18 years of age; and the Melchizedek, or Higher Priesthood, which embraces the balance of the male population of the church.

Upon the outbreak of World War II the American missionaries of the church in war areas were called home. During the year 1941, the missionaries from Australasia and the Pacific isles were also called back to the mainland of the United States, but those in the Americas remained there. The foreign missions were left in charge of the local priesthood and the work was carried forward with much activity and gratifying results, both as to new converts and general church activities. (*See* also CHURCH MEMBERSHIP.) (J. R. CL.)

Morocco: *see* FRENCH COLONIAL EMPIRE; SPANISH COLONIAL EMPIRE.

Mortgages, Farm: *see* FARM MORTGAGES; FEDERAL LAND BANKS.

Mortgages, Home: *see* FEDERAL HOUSING ADMINISTRATION; HOME OWNERS' LOAN CORPORATION.

Mosca, Gaetano (1858–1941), Italian statesman and historian, was born April 1 in Palermo, Italy. An outstanding authority on political science, Mosca was named to the senate in 1919. He was undersecretary of state for colonies, 1914–16, and professor of the history of political doctrines at the University of Rome, 1924–33. Senator Mosca, who held in his teachings that democracy is the best political structure, shunned politics during the fascist regime and was never molested. His best known works are: *Elementi di Scienza Politica* (1896), translated into English in 1939 as *The Ruling Class*, and *History of Political Doctrines* (1937). He died in Rome, Nov. 9.

Moscow. Apart from being the capital of the Union of Soviet Socialist Republics (*q.v.*), and the Russian Soviet Federated Socialist Republic, Moscow is also the administrative centre of the most important industrial area of the U.S.S.R., Moscow Region, which comprises 42 towns, 2,075 rural administrative centres and 68 industrial settlements, with a population of 8,918,389 inhabitants, of which 6,268,331 were living in towns. The population of Moscow itself comprised 4,137,000 inhabitants in 1939.

In 1939 the industrial output of Moscow itself amounted to 16·4% of the industrial output of the country, and Moscow and Moscow Region produced 31·7% of the electric power of the U.S.S.R. In 1939 the electric power station of Moscow itself produced 6,785,500 kw. Nearly half (44% in 1939) of the total output of Moscow industries is the production of the metal industry, which comprises automobiles, machine engineering, electrical engineering, precision tools, radio, etc., as well as war industries; many important chemical factories are situated in Moscow as well as numerous textile factories.

Municipal transport in 1939 comprised 2,405 trams, 272 underground coaches, 486 trolley buses and 1,197 buses. In 1939, 2,570,000,000 passengers were carried, of whom the underground carried 331,800,000 persons. In 1938 the second part of the Metro railway was put in operation, connecting the following: Sokolniki, Komsomolskaya Ploshiad, Park Kultury, Kurskiy, Kievskiy station, Beloruskiy station, Stadium Dinamo, Sobarb Sokol. The third part of the Metro was still under construction in 1941, and it was expected that this part would be put into operation in 1942. In 1935 the soviet government approved a ten-year plan for the reconstruction of Moscow, according to which the area of Moscow would be extended from 63,000 to 148,000 ac.; but the population was to be limited to 5,000,000. The available data show that during 1936–41 a great deal of reconstruction was accomplished. The construction of the Moscow-Volga canal was, on the whole, completed in 1941. The northern port was finished and in use; the southern port was still under construction. During 1936–38 five new bridges were constructed over the Moscow river (Krymskiy, Kamenniy, Moskvorecskiy, Krasnokholmskiy and Ukhtinskiy) and two old ones were reconstructed; also three bridges were built across the canal and one across the Yausa river. The building of houses, however, was carried out at a much smaller rate than that planned.

In 1939, of the 620,000 school children, more than 70% attended new or reconstructed schools. In that year there were 82 higher educational institutions registering 95,000 students; 768 large libraries were in use with 11,300,000 volumes; 438 outpatient hospitals were in use (in 1913 there were only 50), as well as 150 hospitals with 36,300 beds (in 1913 there were 10,600 beds), 34 maternity hospitals with 4,458 beds, 390 crêches with 38,400 cots.

German Campaign on the Moscow Front.—The central German army under the command of Marshal Fedor von Bock (*q.v.*) began its supreme effort early in October to encircle and capture Moscow. The advance was rapid during the first several weeks, and the U.S.S.R. transferred many of its administrative offices to the provisional capital of Kuibyshev (*q.v.*). Between Dec. 1 and Dec. 4 the Germans made their closest approach to Moscow, near Golitzi on the Minsk-Moscow road, only some 20 mi. west of the capital. Then the Russians began a series of counterattacks that threw the enemy back of the Moscow and Nara rivers. A military spokesman in Berlin announced on Dec. 8 that the German high command had abandoned the plan to take Moscow before the end of the year and would assume purely defensive tactics for the rest of the winter. But the Russians, pressing the attack, continued to drive the Germans back, and by the middle of December announced that the threat to Moscow was definitely removed. British and U.S. news correspondents returned from Kuibyshev. They reported that, although the population of Moscow was only a quarter of normal, public utilities were operating as usual. The Kremlin and the business district along Gorki street had not been damaged by air raids, but the Bolshoi theatre and Moscow university were partly demolished. For an account of the war on the central Russian front, *see* WORLD WAR II. (A. M. BV.; X.)

Motion Pictures. A dim outline of what the government expected from the industry in the way of war service had begun to emerge before the close of 1941. It was apparent that heavy demands would be made upon the studios not only for specialized technicians and craftsmen, but also for literary and executive talent. It was likewise apparent that the government expected the industry to contribute strongly to national morale by means of unimpeded picture production.

The year 1941 was, generally speaking, up to the time of outbreak of hostilities, a period of mounting box office receipts and of mounting uncertainty. The industry found itself harassed by political attack and confronted with problems of increased taxation and labour demands. There loomed the additional problem of obtaining needed operational materials under the priorities system of the national defense program.

Anyone leafing over the files of the motion picture trade press might learn how often "panic sweeps industry." World War II, however, brought problems beside which the competition of bowling alleys or night baseball, or the moral criticism of midwestern women's clubs, seemed feather-light.

The loss of most of its foreign market resulted in a somewhat

emaciated but leaner, harder, sturdier industry. It had to plow its home fields, instead of following mirages abroad. Thus its two great prewar trials of 1941—the senatorial investigation of asserted motion picture "war mongering," and the labour racketeering situation—found the industry not only taking a firm defensive stand, but actually an aggressive position.

The closing months of 1941 saw motion picture stocks increased in value and most companies generally reporting improved financial conditions.

A striking example of industry gains was afforded by the report of Twentieth Century-Fox showing a consolidated net profit of $1,549,164 for the 39 weeks ending Sept. 27, 1941, as compared to a net loss of $1,075,611 for the comparative period of 1940. Much of this improvement, but not all, could be attributed to the impetus given by the defense program.

As estimated by the Motion Picture Producers and Distributors, Inc., the capital investment of the industry in 1941 was:

Theatres	$1,900,000,000
Studios	125,000,000
Distribution	25,000,000
	$2,050,000,000

An estimated 280,000 persons were employed in the production, exhibition and distribution branches of the industry, carrying a pay roll of approximately $400,000,000.

Taxes paid to state and local governments were estimated at $250,000,000. Federal taxes were estimated to exceed $100,000,000. On the basis of unofficial figures, box office returns in 1941 were in the neighbourhood of $1,000,000,000. Estimated weekly attendance was 80,000,000.

From the standpoint of public interest, the outstanding event of the year was the senatorial investigation of the industry on a charge of "war mongering." For a considerable time, leading noninterventionists had been accusing the industry of producing pictures designed to heighten American antagonism toward the axis powers, thus supposedly bringing the United States closer to actual entry into the war. Viewed objectively, the senatorial investigation of the film business was one of those ironic occurrences peculiar to democracies. For the industry's viewpoint was that of the administration of President Franklin D. Roosevelt—himself under fire at the time on similar accusations.

This situation came to a climax with the appointment by Senator Burton K. Wheeler, then a leading noninterventionist heading the senate interstate commerce committee, of a subcommittee whose majority membership entertained similar views.

This committee, it was stated, was not to conduct a trial, but to serve rather as a grand jury to determine if an investigation should be made by the senate. It was ruled that Wendell L. Willkie, Republican presidential candidate in 1940, who had been retained as special counsel by the industry, could not cross-examine the witnesses summoned. Thus Willkie's role was limited to expression of his viewpoint in letters, and in statements to the press. In a letter to Senator D. Worth Clark, chairman of the subcommittee, Willkie sounded the keynote of the industry's position, saying:

> On behalf of the motion picture industry and its personnel, I wish to put on the record this simple truth: We make no pretense of friendliness to nazi Germany nor to the objectives and goals of this ruthless dictatorship. We abhor everything which Hitler represents.

The start of the hearings in September found the industry troubled with grave misgivings. It was feared that the mere charge of propaganda, whether or not sustained, would, in the overheated American atmosphere, have an adverse effect on the box office.

Among the industry leaders who testified were: Nicholas M. Schenck, president of Loew's Inc. (Metro-Goldwyn-Mayer); Darryl F. Zanuck, vice-president in charge of production at Twentieth Century-Fox; Harry M. Warner, president of Warner Brothers; and Barney Balaban, president of Paramount.

In general, they denied emphatically any conspiracy to "pump war propaganda to the public" and maintained that the production of films dealing with topical subjects was a public duty.

It was not difficult to estimate the immediate results. The noninterventionist section of the populace endorsed the inquiry. The so-called interventionists supported the position of the industry. There was some belief that box office business was stimulated. Yet in some quarters there was regret that such strong feeling had been aroused. Actual war, however, put an end to all speculation.

Second only to the senate investigation in public interest was the trial in a New York federal court of George E. Browne and William Bioff, president and Pacific coast representative, respectively, of the International Alliance of Theatrical Stage Employees. They were accused of extorting $550,000 from four major studios.

Prominent studio executives testified that they had turned over large sums under threats of strikes that would disrupt the entire industry. Both defendants were convicted. Browne was sentenced to eight years and a $20,000 fine, and Bioff to ten years and a $20,000 fine. Both appealed.

Up to the outbreak of the war, the year was an agitated one so far as labour relations were concerned, as is natural in a period of rising prices. There were many wage increases, and in some situations an actual shortage of skilled artisans due to defense activity.

Only one major strike developed, that of the Screen Cartoonists guild at the Walt Disney studios, and the world beheld the strange sight of picket standards at the home of Donald Duck and Mickey Mouse. The two-month strike resulted in a closed-shop agreement.

The plight of the extra players, whose earnings had fallen off $500,000 in 1940, remained one of the sociological problems of the industry.

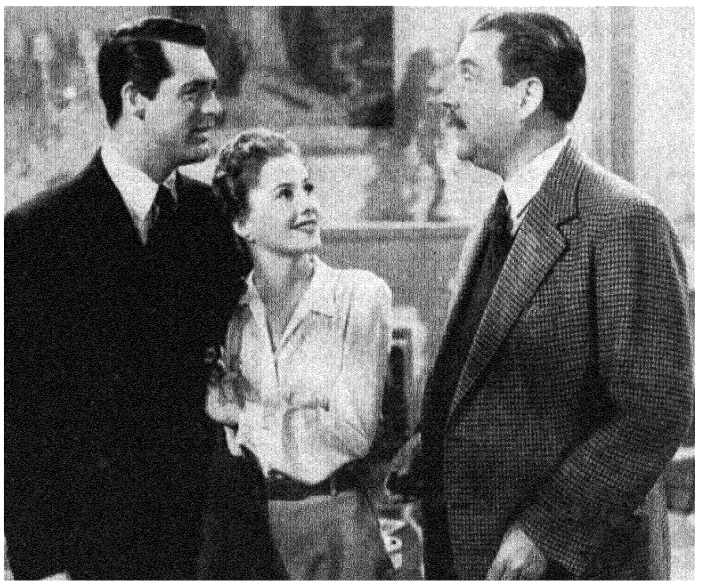
In the field of motion picture production there was a strong trend toward comedy as was evidenced by the sensational success of the team of Bud Abbott and Lou Costello and the greatly increased popularity of Bob Hope. Abbott and Costello were easily the outstanding newcomers of the year, and their three pictures, *Buck Privates, Hold That Ghost* and *Keep 'Em Flying* brought added revenue into Universal's treasury.

Another trend was toward musicals, and statistics show that there were more elaborate and expensive productions of this type made in 1941 than in any previous year.

Pictures with American themes kept pace with the growth of the national emergency. The number of anti-nazi war pictures definitely diminished during 1941. In fact, no picture with an anti-nazi theme had placed among the leading money makers, up to the coming of war. Under conditions of actual war, however, the studios began preparing a flood of pictures with war backgrounds. The box office sensation of the year was Warner's *Sergeant York,* the life story of the great American hero of World War I.

The three newcomers who received the most publicity were Rita Hayworth, Gene Tierney and Veronica Lake.

Preoccupation with Latin America, both from the good neighbour and good business standpoints, continued. A number of Latin-American pictures put out by Hollywood studios revolved around glamorous night life themes and were resented by the peoples of the regions depicted as giving a false impression of their habits and customs. Hollywood, however, through the employment of technical advisers, showed an eagerness to learn. The desire of Hollywood to make friends with the Latin-American neighbours was manifested in the good will tours, first to Mexico in April, and later to South America. The Mexican expedition headed by John



Above, left: CARY GRANT, Joan Fontaine and Nigel Bruce in *Suspicion*. Miss Fontaine received the 1941 Academy award as the best actress of the year for her work in this picture

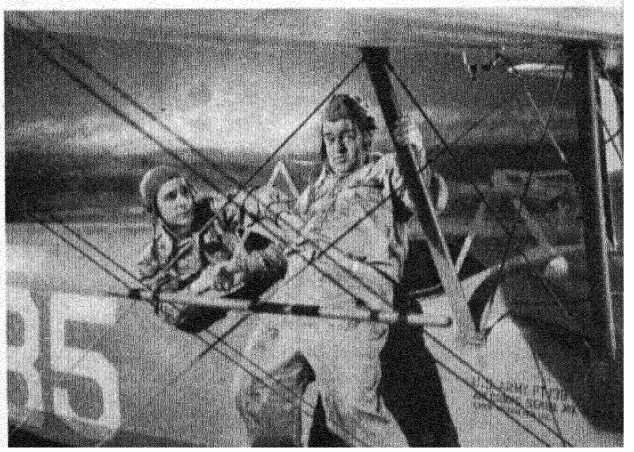
Above, right: ORSON WELLES (centre) in *Citizen Kane*, which received the 1941 Academy award as the best original screen play

Upper centre: THE 1941 ACADEMY AWARD for best supporting actor went to Donald Crisp (centre) for his work in *How Green Was My Valley*. This picture was also voted the Academy award as the outstanding picture of 1941

Lower centre: MARY ASTOR (left) was voted the Academy award for the best supporting actress of 1941, for her role as Sandra in *The Great Lie*, with George Brent and Bette Davis

Below, left: GARY COOPER (front) and George Tobias in *Sergeant York*. For his part in this picture, Cooper received the 1941 Academy award as the outstanding actor of the year

Below, right: BUD ABBOTT AND LOU COSTELLO in *Keep 'Em Flying*, a comedy team which achieved outstanding popularity during 1941



Hay Whitney, head of the division for better American relations, included Norma Shearer, Mickey Rooney, Kay Francis, Laurel and Hardy, Wallace Beery, Frank Morgan and leading motion picture writers and critics from all over the United States. They were greeted by several hundred thousand Mexicans and received by the president of the republic.

Douglas Fairbanks, Jr., who was selected by President Roosevelt and Secretary of State Cordell Hull, visited Brazil and the Argentine as a good will ambassador. Walt Disney, accompanied by his technicians and a complete staff, toured the Latin-American countries. Bing Crosby and John Hay Whitney were others who were enthusiastically received by the Latin Americans.

Prospects of obtaining material and supplies needed for production were uncertain at the year's end. It was generally recognized that motion pictures were essential to national morale and the industry was assured by the government that everything would be done to keep production unimpaired.

However, the closing months of the year found a number of shortages reported. In an industry whose requirements may range from lions to lumber, it was naturally impossible to read the future with any certainty.

Outside of a growing number of pictures, both features and short subjects, dealing with war and defense topics, the war atmosphere was variously reflected. The industry was called upon to play a leading role in supplying entertainment to the armed forces, and many stars made radio and camp appearances. As a community, Hollywood led the nation in its contribution to the United Service Organizations, and the nation's motion picture theatres conducted a United Service Organizations fund-raising campaign that passed the $1,000,000 mark.

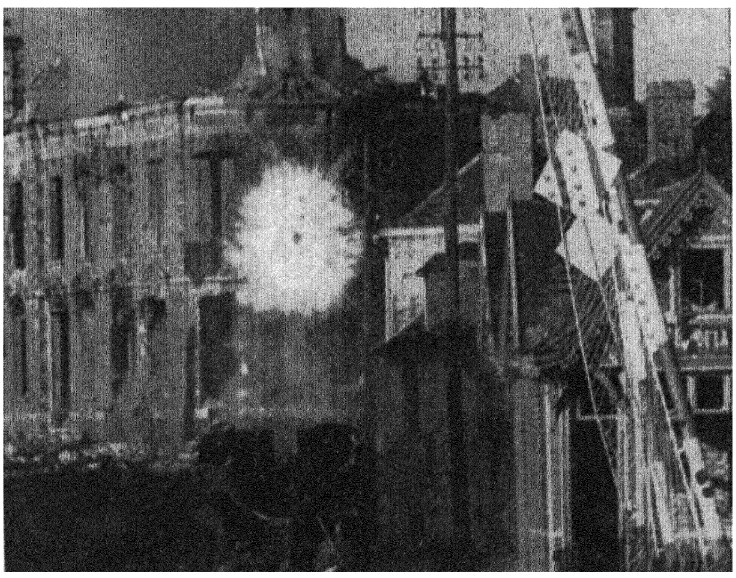
A feature of the industry's role in war preparation was an extensive army training film program, the studios and guilds participating without profit. This program was in charge of Darryl F. Zanuck of Twentieth Century-Fox, who had been appointed a lieutenant colonel in the army signal corps.

Of the members of the industry in uniform, Actor James Stewart, called under the selective service draft, attracted the most public attention.

Director Garson Kanin also was called, taking a government defense post upon his discharge. Calling up of reserve officers also drew upon the industry.

Robert Montgomery, who had performed ambulance service in France at the time of the nazi invasion, was an officer in the navy. Others in service included Director John Ford, Producer Gene Markey and actors Douglas Fairbanks, Jr., Wayne Morris and Stirling Hayden.

"SIEG IM WESTEN" (*Victory in the West*), a German war film, released Jan. 31, 1941 in Berlin, catches a remarkable view of a nazi assault gun firing point-blank into a building defended by French troops at Hangest, south of the Somme river



The so-called consent decree, which became operative in September, provided for revolutionary changes in the method of selling pictures. It abolished "block booking," by which a year's program had been sold in advance, and limited picture sales to maximum blocks of five, after regional trade showings to exhibitors.

At the end of the year 1941, the success of the new system was still conjectural. Early trade showings found only meagre audiences of exhibitors in attendance. Minnesota passed a state law at complete variance with the provisions of the consent decree, and the situation had to be taken into federal court.

Supporters of the consent decree maintained that under it studios were concentrating on the individual production of superior pictures, and showing a tendency toward the gradual elimination of the cheap, run-of-mine films.

Joe Breen, after long services as head of the Production Code of the Hays office, dealing with the morality of pictures, left his post to accept an executive position at the R.K.O. studios.

The year saw a further diminution in the importation of noteworthy foreign pictures.

Outstanding were the English *Target For Tonight, The Stars Look Down* and *Ku Kan,* a documentary film of the Chinese War. George Bernard Shaw's *Major Barbara* was shown, but fell far short of the popularity of the same author's *Pygmalion.* Academy awards for 1940 were announced at the organization's annual dinner on Feb. 27, 1941.

Awards.—Most outstanding picture of 1940, *Rebecca,* Selznick-International-United Artists; best performance by an actor, James Stewart in *The Philadelphia Story,* M-G-M; best performance by an actress, Ginger Rogers, *Kitty Foyle,* R.K.O.; best performance by an actor in a supporting role, Walter Brennan in *The Westerner,* Samuel Goldwyn-United Artists; best performance by an actress in a supporting role, Jane Darwell in *Grapes of Wrath,* Twentieth Century-Fox; best achievement in directing, John Ford for *Grapes of Wrath,* Twentieth Century-Fox; best original motion picture story, Benjamin Glazer and John S. Toldy (pen name) for *Arise, My Love,* Paramount; best written screen play, Donald Ogden Stewart for *The Philadelphia Story,* M-G-M; best original screen play, Preston Sturges for *The Great McGinty,* Paramount; best achievement in art direction (black-and-white films), Cedric Gibbons and Paul Groesse for *Pride and Prejudice,* M-G-M; best achievement in art direction (colour films), Vincent Korda for *The Thief of Bagdad,* Alexander Korda-United Artists; best achievement in cinematography (black-and-white), George Barnes for *Rebecca,* Selznick-International-United Artists; best achievement in cinematography (colour), George Perinal for *The Thief of Bagdad,* Alexander Korda-United Artists; best achievement in sound recording, Douglas Shearer for *Strike Up the Band,* M-G-M (Erpi); best achievement in film editing, Anne Bauchons for *North West Mounted Police,* Paramount; short subjects, cartoons, *Milky Way,* Rudolph Ising-M-G-M; short subjects, one reel, *Quicker 'n a Wink,* Pete Smith-M-G-M; short subjects, two reel, *Teddy, the Rough Rider,* Gordon Hollingshead-Warner Brothers; special effects, *The Thief of Bagdad,* Lawrence Butler, photographic and Jack Whitney, sound; special award for service to the humanities, Bob Hope; special award for co-operation with the U.S. army, Major Nathan Levinson; best song, "When You Wish Upon a Star" (*Pinocchio*), lyrics by Ned Washington, music by Leigh Harline; best musical score, *Pinocchio,* Ned Washington, Paul Smith, Leigh Harline; best musical scoring, Alfred Newman for *Tin Pan Alley;* technical achievement, Daniel Clar, Grover Laube, Charles Miller, Robert W. Stevens, all Twentieth Century-Fox, for silenced camera. (*See* page 445 for 1941 Academy awards.)

The *Motion Picture Herald* poll listed the ten biggest money-making stars of 1941. For the third time Mickey Rooney headed the list. The others named in order were: Clark Gable, Abbott and Costello, Bob Hope, Spencer Tracy, Gene Autry, Gary Cooper, Bette Davis, James Cagney and Judy Garland.

The outstanding pictures of 1941 included *Sergeant York, Hold Back the Dawn, The Little Foxes, Blossoms in the Dust, Caught in the Draft, Dumbo, How Green Was My Valley, All That Money Can Buy, Meet John Doe, Men of Boys' Town, Tom, Dick and Harry, That Hamilton Woman, Penny Serenade, Week-End in Havana, The Lady Eve, Here Comes Mr. Jordan, Unfinished Business, Lydia, Andy Hardy's Private Secretary, The Maltese Falcon, Man Hunt, The Reluctant Dragon, They Died With Their Boots On, Cheers for Miss Bishop, Whistling in the Dark, Ball of Fire.*

(L. O. P.)

The development of new and improved types of studio and theatre equipment during 1941 was materially retarded by restrictions imposed upon availability of materials by the requirements of national defense preparations. The principal accomplishments, therefore, were more in the nature of improvements, rather than new developments, of both equipment and processes.

Optics.—Further work on the evaporation method of depositing anti-reflection coatings resulted in the production of lens coatings of more accurately controlled thickness and of greater durability than had heretofore

been available. The RCA "Magicote" process resulted in the production of baked coatings which were mildly acid and alkali proof, and applicable to all types of lens systems. These coatings are of such hardness and durability that they are not injured by repeated cleaning, and may, therefore, be applied to both inner and outer lens surfaces without risk of subsequent deterioration of the coatings due to normal usage of the lens equipment.

Film.—Fine grain positive film for release prints, first introduced in 1940, was being generally adopted by the industry during the year 1941, Paramount having made all release prints on fine grain stock since March of 1941, and both Warners and M-G-M printing a portion of their release on this type of film shortly thereafter. Prints on the new fine grain stocks are characterized by improved rendition of fine detail, a marked reduction in visibility of grain pattern on the screen, apparently increased shadow definition, smoother gradations in picture half tones, and a perceptible reduction in the reproduced film ground noise of the associated sound track. Sound track print density latitude for acceptable cross-modulation is approximately double that of previously employed print stocks.

Fine grain sound negative stocks especially designed for variable density recording systems were introduced during the year, and were gradually adopted because of the improved resolution and reduced level of film background noise obtained from these films as contrasted with previously used emulsions.

A new direct reading precision photoelectric densitometer was introduced to the industry during 1941 by Electrical Research Products, Inc., and enjoyed notable acceptance in motion picture laboratories of the United States. This instrument, which is of the integrating sphere type, has a working density range of from zero to three, and may be adjusted to read either visual diffuse or effective printing densities.

An automatic negative cleaning machine was developed by Warner Bros. which eliminates all hand operations in the cleaning of motion-picture negative film. Warner Bros. also developed a mild steel alloy staple for joining lengths of film being fed through the developing machines. These staples replace the previously used, more expensive, stainless steel staples, which were in 1941 quite difficult to obtain.

Sound.—A new high-speed volume-limiting amplifier introduced by Electrical Research Products, Inc. found wide acceptance among the studios employing variable density recording. This device serves to prevent momentary sound track overloading due to high-peak signal levels, and thus makes possible higher quality recording without a reduction in average recording level. Variable area recording channels continued to employ electronic volume compression in both original and release recordings to achieve the same purpose.

M-G-M adopted the use of a special cylindrical objective in their recording machines which results in a recording slit image height of only two ten thousandths of an inch. Reduction of slit image height to this value resulted in the practical elimination of distortion caused by the light valve ribbon velocity effect, and made possible adoption of the RMA 100 microsecond standard pre-equalization curve on all original recording circuits. Such recordings are reproduced with appropriate post-equalization and result in somewhat improved signal-to-noise ratio as compared with unequalized recordings. Re-recordings made for release printing must, of course, employ a recording circuit of normal frequency characteristic.

The use of negative feedback to eliminate resonance in the Western Electric light valve was generally adopted in variable density recording systems to secure improved quality of recording in the high-frequency region of the audio spectrum.

Lighting.—The widespread adoption of high-speed picture negative stocks resulted in a trend toward greatly reduced values of motion-picture set lighting intensities. This, in turn, was followed by the general use of smaller lighting units, and permitted balancing of set lighting to be accomplished by means of dimmers on individual lamps rather than by moving of lamp units and increasing or decreasing the number of lighting units employed. This form of light-balance control was being experimentally applied to arc lamps and overhead lighting, as well as to floor units, and should effect considerable economy in picture production.

A pronounced trend toward the use of incandescent lamps in technicolor productions was noted. When employed for colour photography, the incandescent lamps are operated at higher-than-normal voltage, and then screened to appropriate quality with blue filters.

A new 13.6 mm. high-intensity projector carbon was introduced by the National Carbon company for use in both process photography background projectors and large theatre projectors. The new carbon, which operates in the current range between 125 and 150 amperes, delivers a slightly higher crater candle power at 150 amperes than the super high-intensity carbon, previously developed by National, delivers at 180 amperes. Compared with regular 125 ampere carbons, the new carbon working at 150 amperes delivers from 28 to 47% more screen light, depending upon the type of optical system employed. In addition, the new carbon has greater latitude in relative carbon positions at which steady burning may be attained, is more resistant to both thermal and mechanical shock, and operates at a consumption rate only slightly more than one-half that of super high-intensity carbon.

Colour.—The year 1941 witnessed the use of 16 mm. kodachrome film in place of the more expensive 35 mm. technicolor negative for the production of a number of short subjects in colour at Warner Bros. The original negative is produced on standard 16 mm. kodachrome, is then processed at the Eastman plant in Rochester, N.Y., and held at that point until negative cutting is completed. A black-and-white reversal print is forwarded from Eastman to the producer for purpose of editing; after completion of this process the original kodachrome is cut to match the edited black-and-white print. The kodachrome film is then sent to technicolor for production of the necessary separation negatives on 35 mm. film, and subsequent 35 mm. technicolor prints for general release.

Large savings in production cost become possible through this use of 16 mm. film. It also becomes feasible to photograph many subjects whose inaccessibility has heretofore rendered photography with the heavier and more bulky 35 mm. equipment impracticable. These advantages are not sufficiently great, however, to offset the much greater latitude and control offered by the standard technicolor process for the production of feature length pictures. For the time being, therefore, the use of 16 mm. kodachrome in studio production activities must be viewed as a valuable adjunct to normal colour work rather than as a substitute for the more versatile, even though more costly, technicolor process.

Theatre equipment.—The new model Brenkert and Century picture heads made available to theatre operators the highly efficient double rear shutter type of projector mechanism, with a resulting screen light intensity increase of 25 to 30% over that obtained with single shutter heads, or an increase of approximately 15% over that obtained from heads employing front and back shutters. The Brenkert head features sealed unit construction of unusual sturdiness, self lubrication, concentric shutter shafts, and separate drives for the intermittent and shutter mechanisms. A mechanical fuse is incorporated in the main gear drive shaft to avoid shearing of gears in the event of freezing of any portion of the driven gear system.

The application of ultraviolet or "black light" in conjunction with fluorescent tapestries and carpeting for both artistic and utilitarian purposes was noted in a large number of theatres during the year. Condenser type lighting units were being generally adopted in an effort to prevent unnecessary scattering of the ultra-violet radiation, and resultant interference with the vision of theatre patrons wearing eyeglasses.

RCA made available a new type of theatre screen known as the "Magic Screen," which consists of a layer of wood pulp, bleached to a dead white, on a suitable cloth backing. This screen is not susceptible to discolourization by oxidation of its surface, and, being very thin, transmits sound approximately 12% better than normal screens of equal light-reflecting power. The cost of the new screen is about one-third that of present standard screens of equal size. (*See* also PHOTOGRAPHY.) (N. LN.)

Motor-Boat Racing.

Probably the most significant feature of the 1941 motor-boat racing season was the complete breakdown of competition in the famous Gold Cup event which, for 37 years, had been the blue ribbon contest of the field. In recent years a real race had been more the exception than the rule. But an all-time low was reached in 1941 when only one boat, Zalmon G. Simmons's "My Sin" appeared at Red Bank, N.J., for the Gold Cup championship. "My Sin," which had won the cup in 1939 in a real battle, took it in 1941 merely by cruising through a single 30-mi. heat at half speed.

There was no other big boat racing as it used to be known. But the series of regattas for the 225-, 135- and 91-cu.in. hydroplanes, the runabout classes and outboards were well attended and produced close competition and many new speed records. The 225's continued much the fastest and most popular of these classes, with honours quite evenly divided among three or four consistent topnotchers. The National Sweepstakes title, which has in recent years been almost exclusively a "225" event, was taken by George Schrafft's "Chrissie IV." Joseph J. Taggart's "Tommyan III" at the same regatta won the national championship of that class. Jack Cooper, the Kansas City veteran, won his share of contests with "Tops." Cooper was also a leading contender in the 91-cu.in. class in 1941, winning the national championship and setting a new speed record of 53·129 m.p.h.

The National Outboard championship, held at Austin, Tex., in 1941, brought out 11 entries from 24 states. Seven new champions were crowned with Paul Wearly, of Muncie, Ind., the outstanding performer, taking the professional titles in both Class A and Class B. (H. L. ST.)

Motor Buses: *see* MOTOR TRANSPORTATION; MOTOR VEHICLES.
Motor Cars: *see* MOTOR VEHICLES.
Motor Racing: *see* AUTOMOBILE RACING.

Motor Transportation.

The common carrier motor bus industry comprises two main operating groups, those companies offering intercity or long-haul service and those engaged in purely local service within the limits of a single city and its adjoining suburban areas. A common carrier is defined as one that operates between fixed termini at a fixed rate of fare. Such operation usually is protected by a franchise granted by a regulatory body. The long-haul common carriers divide roughly into companies operating within the boundaries of one state, known as intrastate carriers, and interstate carriers, which are licensed to operate across state boundary lines.

All types of common carriers are closely regulated, either by state, federal or municipal agencies, and in some cases by all three. Interstate highway carriers have been under federal regulation since 1935. The body charged with this responsibility is known as the Motor Carrier bureau and is a division of the Interstate Commerce commission. Intrastate carriers, those operating solely within the boundaries of a state, have long been under the regulation of their respective state governments.

The fundamental provisions of both federal and state regulation are similar. In addition to the granting of operating certificates, or franchises, regulation also covers insurance requirements; measures designed to promote safety, such as equipment specifications; a standard accounting classification; the filing of tariffs, and compliance with the rates filed in those tariffs. These were the major provisions of motor carrier regulation in 1941, with variations peculiar to the various states or localities. City or local carriers usually are regulated in a somewhat similar manner by the governing bodies of the cities or municipalities in which they operate.

Buses.—The common carrier motor bus industry in 1941 represented an investment of approximately $310,000,000 for rolling stock, and $240,000,000 for terminals, garages and maintenance equipment. This does not include a valuation for franchise rights, which under many state laws cannot be capitalized. Taxes directly assignable to operation were $53,535,000 during 1941, exclusive of income taxes and excess profit taxes. The actual size of the common carrier bus industry is indicated by the following statistics from the magazine *Bus Transportation*.

At the close of 1941 there were 3,560 common carrier bus operating companies in the United States. Of these, 900 companies were operating in city and suburban service, 2,200 were in intercity and long-haul service and 460 in sightseeing and charter-hire operation. These companies jointly owned 57,580 buses, divided 36,900 in city and suburban service, 18,100 in intercity and long-haul service and 2,580 in sightseeing and charter-hire service. Jointly they operated regular routes over 361,000 mi. of highway, of which 30,000 mi. was in city and suburban service and 331,000 mi. in intercity and long-haul service.

Motor bus revenue for 1941 amounted to $529,199,000, divided $302,322,000 for city and suburban carriers, $218,377,000 for intercity carriers and $8,500,000 for sightseeing and miscellaneous operation. Passengers carried by buses in 1941 reached the astounding total of 4,794,956,000. Of these 433,845,000 were intercity passengers, 3,500,000 were sightseers and 4,357,611,000 were city and suburban riders.

The years from 1940 on had seen an ever-quickening changeover from street railway to bus operation in cities. The records show that over 723 cities having a population of more than 10,000 were in 1941 served entirely by buses. (There are 1,077 cities in this population group.) Steam railroads had gone in heavily for motor bus operation. Fifty-two railroads in 1941 owned 1,759 buses, while in addition, many steam railroad companies held substantial stock ownership in motor bus operating companies and thus were directly interested in motor bus transportation.

Most significant among motor bus developments were the services rendered by the industry first in connection with the defense program and war. So vital did the government consider these services that the motor bus manufacturers were granted an A-3 priority rating.

One of the biggest responsibilities of the bus industry was to assure adequate transportation of workers to and from plants and factories, and for those who had to shift around the country to new scenes of employment. These purely public-carrier services were expected to become of increasing importance with the restrictions on the use of private automobiles.

Buses were likewise shouldering a number of purely military responsibilities. For example, the selective service system used buses on a large scale for shuttling drafted men to and from examination and induction points, while the army itself on several occasions used commercial buses for carrying troops during actual military manoeuvres. The carrying of army, navy and other military personnel during furloughs, and for the transfer of men between posts and bases, likewise was affording the industry a significant opportunity to perform essential wartime services. Should the evacuation of certain areas become necessary, or should it be necessary to transport large army forces across the country with the utmost speed, the industry, with its vast available pool of equipment and trained personnel would be ideally fitted to shoulder that responsibility, and plans were being laid against such eventualities.

Still another phase of the motor bus industry is represented by the operators of noncommon-carrier service. These are companies or individuals not operating between fixed termini, service being rendered under contract, or on a charter-hire basis. In this group are buses owned and operated by hotels, apartment houses, department stores, etc., passenger service being rendered in connection with these enterprises but not directly for profit. By far the largest group in the noncommon-carrier field are the buses operated in connection with public and private schools. While school bus operation is not a source of large revenue—since much of the equipment is school-owned and the balance operated under relatively low-priced contracts—it does represent a highly important phase of the nation's educational system, and a reserve of equipment that could be called upon in case of need. Approximately 44,750 schools used buses in 1941 to carry pupils to and from their classes, utilizing 87,400 buses. Children carried daily in this service totalled 4,142,000 in 1941, at a cost of $79,155,000. There were 1,281,000 mi. of school bus route.

Trucks.—In size the motor truck industry far exceeds the bus field, and there are many ramifications of the types of service operated. Trucks are used not only by cartage companies in cities and by long-distance haulers, but by private businesses as a part of their service to customers. The 1930 census by the Automobile Manufacturers' association shows, for instance, that there were 997,033 trucks on farms alone. This same census showed 4,320,829 trucks of all types were licensed during the year 1939, a vast reservoir of equipment which takes on the highest significance in the light of war needs.

The large truck fleets are owned mostly by private shippers. On June 1, 1939 the Bell Telephone company, for instance, operated 16,210 trucks; Standard Oil of New Jersey, 12,000; the Railway Express agency, 9,960. According to compilations of the Automobile Manufacturers' association 31 private companies operated more than 1,000 trucks apiece, while approximately 1,000 companies operated truck fleets ranging all the way from 100 to 1,000 trucks apiece. These figures do not include tractors, trailers or cars owned by these companies. In 1939 there were 1,180,411 trailers registered in the U.S.

Railroad use of motor trucks is rapidly expanding. In 1925 a total of only 900 trucks were used in railroad service. By the end of 1939 this had grown to approximately 65,500 trucks in railroad use. This includes terminal transfer service, intercity service, and store-door delivery. Another 230,375 motor trucks were owned by federal, state and local governmental departments. A highly significant sidelight on the use of motor trucks was offered by a study of the U.S. bureau of public roads which in May 1939 reported that 80% of all trips by motor truck are under 20 mi. in length. According to another government survey 60% of all common carrier truckers travel less than 100 mi. per trip.

The trucking industry in 1941 gave employment to more than

3,650,000 drivers, with an uncounted number of freight handlers, mechanics and helpers. It is closely regulated in every state as to

Table I.—*Distribution of Motor Truck Fleets by Industries in the U.S.*
(Source: Chilton Company)

As of February, 1941	Fleets of 8 or More Trucks	
	Fleets Number	Trucks Number
Bakeries, Candies, Florists	1,485	62,342
Bottlers, Breweries	930	24,046
Coal Dealers, Mineral Mines	1,041	18,297
Contractors, Builders	2,457	50,775
Dairy Products, Milk, Ice Cream	1,485	62,553
Department Stores, Furniture	417	11,020
Express, Hauling, Inter & Intra State	5,301	176,313
Flour, Feed, Grains	143	3,433
Government, State, County, Municipal	2,000	239,902
Ice Dealers, Manufacturers	575	15,011
Laundries, Cleaners, Dyers	1,556	34,766
Manufacturers, Steel Mills	837	15,624
Meats, Fish	670	17,489
Newspapers, Publishers	137	4,088
Oil, Gasoline, Greases	1,224	75,045
Paints, Chemicals, Drugs	170	3,723
Public Utilities, Railroads	1,210	79,545
Vegetables, Farmers, Chain Stores	1,517	30,769
Miscellaneous	1,059	23,851
Totals	24,214	957,592

These fleets operate, in addition, over 500,000 passenger cars.

sizes, weights and speeds and must conform to innumerable other regulations both state and federal. It pays annually over $400,000,000 in special truck taxes over and above all regular levies on business, property and income. A 1940 report shows that it served 48,000 communities not reached by the railroads. (*See* also BUSINESS REVIEW: *Industrial Groups;* HORSES; MUNITIONS OF WAR.) (C. W. S.)

Other Countries.—No figures on the motor cars registered in most of the principal countries at the close of 1940 being available, the figures for the beginning of 1939 are given in Table II.

Table II.—Motor Vehicle Registrations, Exclusive of U.S., in Early 1939

Country	Private Cars Taxis '000's	Trucks Buses '000's	Total '000's
United Kingdom	1,916	626	2,542
France	1,750	500	2,250
Germany	1,306	402	1,708
Canada	1,161	220	1,381
Australia	552	252	804
U.S.S.R.	85	593	678
Italy	303	86	389
Union of South Africa	294	45	339

Even if figures were available, they would be misleading. The year 1941 opened with motor transportation reduced, except for military purposes, in all countries actively engaged in war. The spreading of the war and the effectiveness of the British blockade resulted in an extension in the reduction, until it can be said that no European country was unaffected. The extent of the reduction was variable in quantity, but the fall was rarely less than 50% and more often greater, since the vehicles still in operation were running a smaller mileage in a year. Many countries outside Europe were affected increasingly during 1941, so that not only in the old world but in Australia and Canada there were curtailments. Military traffic continued to increase, but not to the extent that civilian traffic declined.

In Great Britain the public services on the roads were further curtailed during the year. So great was the reduction that more overloading of vehicles was noticeable. Passengers often had to wait in long lines, and then travel in overcrowded vehicles. The movements in rates and fares differed. In some countries governmental control kept them stationary, while in others there were considerable increases. As in many countries all means of transport were overtaxed, the problem of division of function was in abeyance.

The problem of safety on the roads continued to be, if anything, of even more urgency than in 1940. With the decline in motor transport the casualties were fewer, but the accidents were more deadly. In Great Britain, for instance, while the persons injured fell by about 10%, the deaths nearly doubled as compared with prewar figures. Active steps were being taken aiming at a reduction, and the figures for August and September were the first to show any reduction from those of 1940. It remained to be seen whether the improvement would be continued. The chief causes, however, remained: restrictions on lighting and persons driving who had not been subjected to official tests and would not have passed them if they had been. A new cause was to be found in the condition of the vehicles. New vehicles were difficult to obtain, so vehicles were kept running to a greater age. New parts were obtainable only after long delays, so temporary repairs had to be resorted to. The vehicles were less reliable and failures leading to accidents more frequent. (*See* also RAILROADS.) (W. T. St.)

Motor Vehicles. During 1941 the automotive industry began to feel the full impact of the rearmament program. There was no formal announcement of the 1942 models. Design of 1941 models was not frozen because much retooling had been completed before the limitations of the defense program were evident and because re-design was required to replace critical defense materials such as nickel, aluminum and zinc.

The replacement of high nickel and chromium alloy steels with alloys containing manganese, molybdenum and silicon initiated refinements in heat treating technique and stimulated research on the problems arising from those substitutions. This research program should produce far-reaching results.

Early in 1941 it became evident that production curtailment of passenger cars would be necessary to save materials for defense purposes. The original production program for the 1942-model year called for a tentative curtailment of at least 50%. During the first seven months of the 1942-model year under this original program, allotments were reduced 39.7% with respect to the same period in 1941. With the United States' declarations of war with the axis powers in December, the original program was instantly discarded. The allotments for the last two weeks in December were reduced 25% and those for January were halved.

That an effort would be made to keep existing vehicles operating was indicated in 1941 when the Office of Production Management gave replacement parts priority status. The necessity for some such action was demonstrated by a comprehensive survey which showed that more than half the mileage and three-fourths of the automobile trips were for purposes connected with earning a livelihood or closely related economic pursuits.

National defense became the dominant factor in the automotive industry during 1941. Defense contracts totalling $4,272,676,000 had been received by motor vehicle manufacturers during the period from Sept. 1, 1939 to Oct. 31, 1941. Because most of the machine tools used in automobile production were not adaptable to defense production it was necessary to build many new plants and order new machine tools to fulfil these contracts.

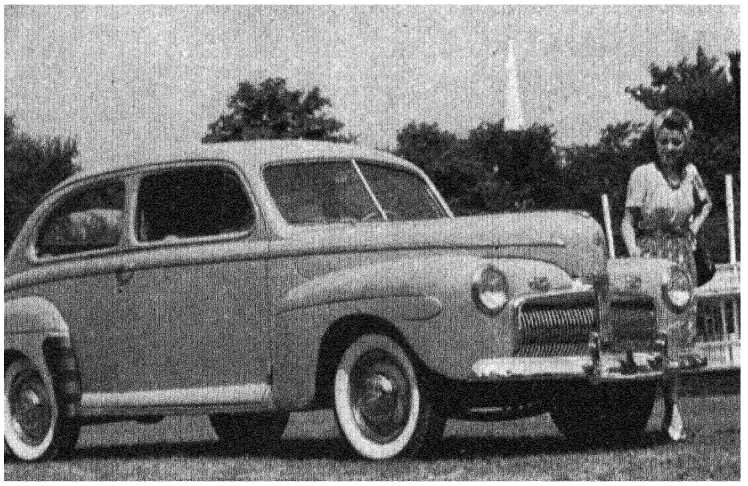
Aircraft production became a major activity and there were few components of an aeroplane not being built by automotive producers. One company was building a 58-ac. factory for assembly line production of four-engine bombing planes; virtually all other manufacturers were building subassemblies of the various aeroplane components. Production of liquid-cooled aircraft engines was well established in two plants. Four automobile producers were in various stages of production of air-cooled radial engines and others were actively engaged in making engine parts.

The different defense items being manufactured were too numerous and diverse to be completely listed. Prominent among these were trucks, tanks, aircraft cases, gasoline and diesel marine engines, fire directors, heat exchangers, bulletproof gas tanks, tires, gas masks and machine tools.

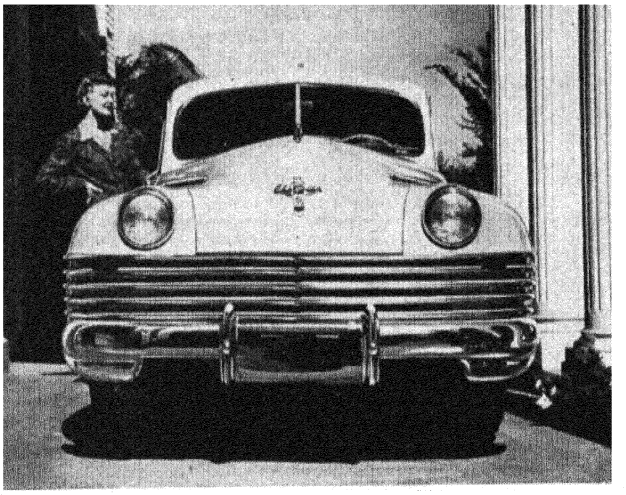
Automotive methods applied to military and naval products in many cases resulted in improved design and ahead-of-schedule deliveries. Subcontracting was an important factor in expediting production.

The United States' entry into World War II gave the motor vehicle industry an even greater responsibility as a provider of munitions. As in the past, its most important contribution would be management-administrative and technical.

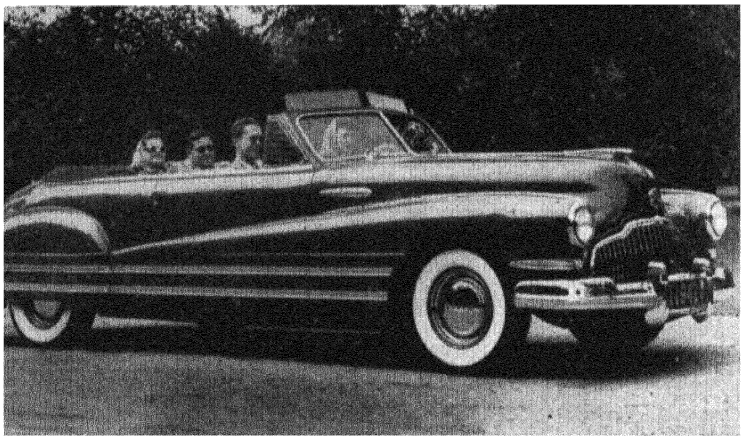
Motor vehicle production in 1941 showed an 8% increase over the previous year; United States factory sales were 4,820,000. Motor vehicle registration in the United States was 33,725,000 which was 74% of the total world registration. Exports showed a further decrease and amounted to 5.1% of production. Employment in auto, body and parts factories was 516,000 at be-



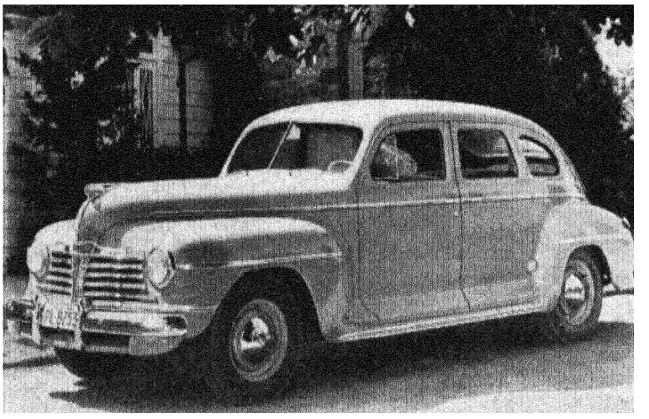
THE 1942 FORD was further streamlined and had a lower body



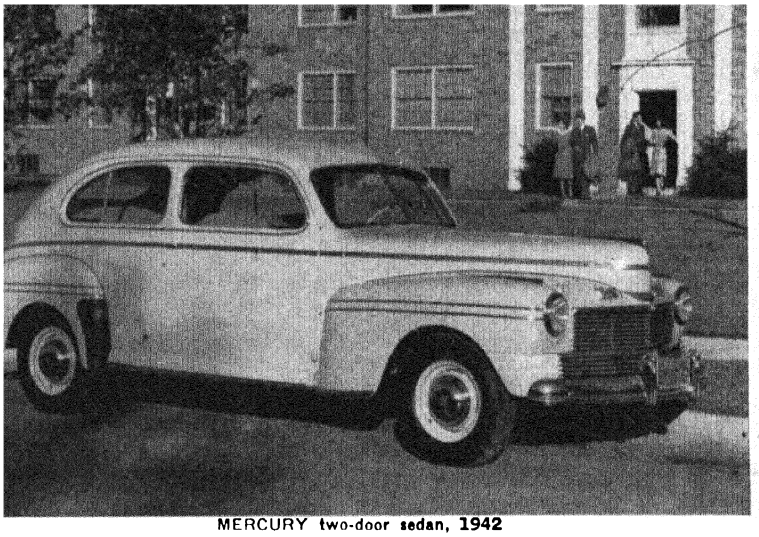
SWEEPING HORIZONTAL GRILLWORK was a decorative trend of 1942



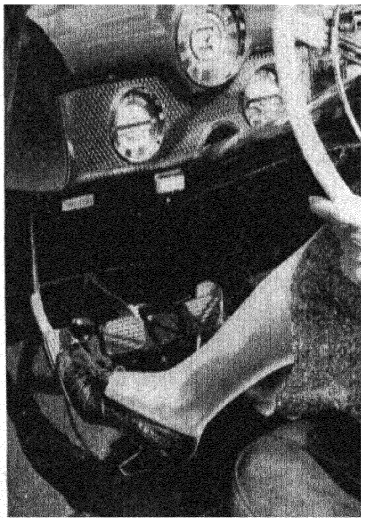
FULL-LENGTH STREAMLINING of fenders on the 1942 Buick



1942 PLYMOUTH four-door sedan

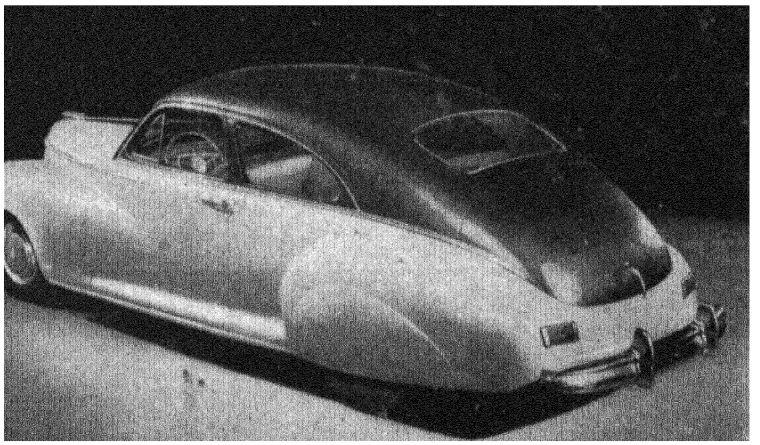


MERCURY two-door sedan, 1942

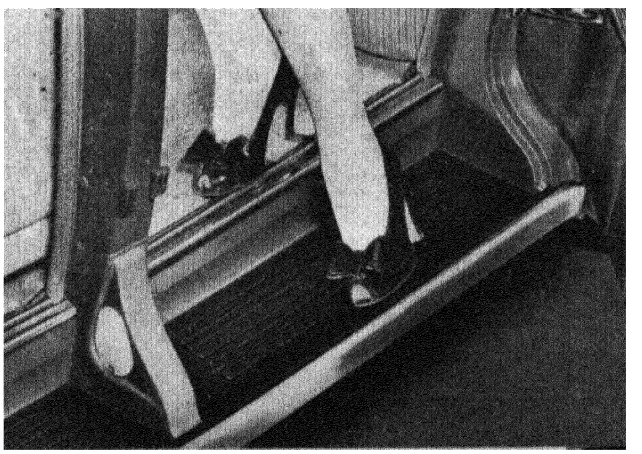


THE PARKING BRAKE of the 1942 Buick is engaged with a small foot pedal to the left of the clutch; it is released by pulling out a hand control at the lower left-hand corner of the instrument board

PACKARD discontinued its uniform conventional design in April 1941 when it introduced the fully-streamlined "Clipper"



CONCEALED RUNNING BOARDS of full width and length were standard equipment on most 1942 cars



ginning of 1942. During the first nine months of 1941, motor vehicle deaths were 27,570, a 17% increase over 1940. Most of this increase was caused by increased travel; the mileage rate increased only 4%.

Transmissions.—Transmission improvements continued to be the foremost mechanical trend. Four additional makes of cars added such devices as optional equipment for 1942-models bringing the total to nine. Fluid couplings were in use on a majority of these because they smooth out the shift change. One model added a torsional vibration damper to the driving torus of the liquid coupling. One of the new transmissions eliminated the clutch pedal entirely while another was so arranged that it permitted either semi-automatic shifting, automatic clutch operation, or manual shifting with the latter always operative.

Conventional single disc dry clutches were used in all but one automatic transmission which used planetary gears and a combination of band clutches and multiple wet disc clutches. Automatic clutching mechanisms were actuated by hydraulic or vacuum devices.

Shift timing was controlled either by speed governors, throttle position or a combination of both.

All these devices permitted more effective use of a gear ratio with consequent increase in economy as well as acceleration and, at the same time, eliminated most of the manual gear shifting formerly required in normal driving.

Table I.—*Preliminary Statistics of the Automobile Industry, 1941 Calendar Year

Production and Value

Car and truck factory sales, from U.S. plants:†	
Total	4,820,000
Passenger cars	3,750,000
Trucks	1,070,000
Per cent increase over 1940, motor vehicles	8%
Wholesale value of cars	$2,610,000,000
Wholesale value of trucks	1,020,000,000
Wholesale value of cars and trucks combined	3,630,000,000

Military Assignments

Total defense orders cumulated from Sept. 1, 1939 to Oct. 31, 1941 (It should be noted that this total includes contracts already delivered.)	$4,272,676,000

Classified into broad groups, these orders were for the following equipment:

	Value	Per cent of total
Military motor vehicles and parts	$ 788,744,000	18.5
Aircraft, aircraft engines, subassemblies and parts	1,988,076,000	46.5
Tanks and parts	713,067,000	16.7
Marine equipment	234,505,000	5.5
Guns and ammunition	532,006,000	12.4
All other	16,188,000	.4
Total	$4,272,676,000	100.0

Registrations

Motor vehicles registered in U.S. (Dec. 31, 1941)	33,725,000
Motor cars	28,875,000
Motor trucks	4,850,000
Number of vehicles required to replace vehicles scrapped	2,600,000
World registrations of motor vehicles	45,500,000
Per cent of world's automobiles in U.S.	74%
Per cent of motor vehicles on farms and in villages under 2,500 population	40%
Passenger cars	30%
Trucks	46%

Taxes

Total motor vehicle user taxes	$2,100,000,000
Gasoline taxes, federal, state and municipal	1,325,000,000
Per cent motor user taxes to all taxes from all sources, federal, state and local	11%

Foreign Sales†

Number of motor vehicles exported from United States	245,000
Per cent of U.S. production exported	5.1%

Employment

Employment in auto, auto body and parts factories	516,000
Weekly payroll, wages	$20,600,000

Motor Trucks and Buses

Motor trucks in use	4,850,000
Total special motor truck taxes	$550,000,000
Number of bus and truck drivers	4,300,000
Motor buses in use	145,000
Number of communities served only by motor vehicles	48,000
Number of children carried to school daily by buses	3,075,000
Per cent of trucks privately owned and operated	86%
Per cent of livestock hauled to market by truck	57%
Number of trucks on farms	1,047,084

Motor Vehicle Retail Business

Total dealers handling passenger cars	38,836
Total repair shops	87,452
Total retail outlets, duplications eliminated	93,694
Wholesalers	6,585
Retail gasoline outlets	400,000

Passenger Car Use

Per cent of cars used partly or entirely for business purposes	95%
Per cent of passenger car *mileage* for business purposes	55%
Per cent of passenger car *trips* for business purposes	77%
Number of U.S. cities without local mass transportation, dependent on passenger cars	2,320
Number of passenger cars on U.S. farms	4,144,136

*Compiled by Oscar P. Pearson, Chief Statistician, Automobile Manufacturers Association.

†Including military vehicles delivered to U.S. armed forces and non-axis governments.

Table II.—*Automobile Industry's Defense Products*

Aeroplane ignition testers
Aircraft control instruments
Aircraft engines
Aircraft machine guns
Aircraft parts
Aircraft propellers
Air gauges
Aluminum alloy forgings
Ambulances
Ammunition boxes
Ammunition machining
Amphibian tank radiators
Anti-aircraft guns and cannons
Antitank mine fuses
Autosyns
Black-out lamps
Bomb components
Bomb loading trailers
Bombers, complete and subassemblies:
  Airframes
  Centre sections
  Nose sections
  Rear sections
  Wing sections
Cannon
Cantonment furnaces
Cartridge cases
Castings
Cord winders
Cranking motors
Dies, jigs and fixtures
Electrical equipment
Field radio stations
Field ranges
Field range cabinets
Field telephone exchanges
Fire unit for field range
Forgings
Fuses
Gun carriages
Gun control equipment
Gun directors
Gun mount parts
Instrument panels
Machine guns
Machine tools
Magnesium
Marine engines, diesel and other
Naval ordnance
Practice shells
Pressure caps
Radios
Refrigerators and parts
Shell forgings
Shell hoists
Shells
Solenoids for bomb release
Tanks
Tanks, trackless
Tank engines
Tank parts
Tent heaters
Torpedo parts
Torpedo tubes
Trailers and semi-trailers
Turrets
Water coolers
Motor vehicles and parts:
  Ambulances
  Army carryalls
  Artillery prime movers
  Assault boat carriers
  Buses
  Cargo body trucks
  Command reconnaissance cars
  Crash trucks
  Dump trucks
  Earth borers
  Field kitchen trucks
  Field radio cars
  Fire engines
  Flood lighting trucks
  Half-track personnel carriers
  Mortar carriers
  Personnel carriers
  Pole setter trucks
  Scout cars
  Staff cars
  Telephone maintenance trucks
  Tractor trucks
  Troop transport trucks
  Weapon carriers
  Wrecker trucks

Engines.—Owing to the shortage of many critical materials caused by the rearmament program there were many engine changes in the 1942 models. Aluminum for pistons was replaced by cast iron or steel in all but a few models; these latter were prepared to change when the necessity arrived. The use of an oil-absorbing coating of insoluble iron and manganese phosphates to replace tin plating on pistons increased. The increased weight of ferrous pistons resulted, in some cases, in heavier crankshafts and connecting rods as well as larger main and connecting rod bearings and the more general use of steel-backed thin babbitt bearings. One maker, following aircraft engine practice, was shot-blasting connecting rods to improve fatigue life. Rough surfacing of crankpins was introduced in one engine to increase bearing capacity. Some carburetter bodies were of cast iron rather than zinc alloy die castings. An oil cleaner of greater efficiency redesigned with a steel stamping to replace an aluminum casting was featured on one model. The trend of engine power and compression ratio was upward.

Passenger Car Bodies.—Continuing the trend set several years before, the 1942 models looked longer, lower and more massive. Wheelbases and overall lengths were slightly increased but the principal reason for this appearance change was improved design rather than an appreciable dimensional increase. Front fenders were longer and on six makes of cars long, sweeping lines were achieved by extending the front fender into the door. Radiator grilles were wider, bumpers were heavier and curved around the fenders for added protection. Hoods were broader and more rounded in front. Headlamps were farther apart and one model featured recessed lamps covered by sliding panels which were flush with the fender and operated by a knob beneath the instrument panel. With but few exceptions running boards were either absent or concealed by the door. Streamline bodies provided two to three inches more headroom in back. Heating and ventilating systems were the object of general improvement and nearly all provided fresh air intakes at the front. Decorative plating which appeared on the early 1942 models was discontinued to conserve chromium, nickel and copper for defense uses. Die-cast radiator grilles of zinc alloy were replaced by steel stampings.

Chassis.—Heavier and redesigned frames, changes in spring rates, and smaller wheels were among the changes made to accommodate the wider, longer bodies. Wider base rims providing increased lateral stability were introduced. A redistribution of braking effort was effected on some cars to increase the proportion of the total braking effort carried by the front wheels. A brake drum sealed from dirt and designed to nullify the effects of heat expansion was introduced. Interleaf spring lubrication by oil-filled wood liners and by wax-impregnated liners was featured. (*See* also BUSINESS REVIEW: *Industrial Groups;* PETROLEUM.) (C. F. KE.)

Mount Holyoke College. A pioneer American institution for the higher education of women founded in 1837 by Mary Lyon and situated at South Hadley, Mass. The campus covers 480 ac. with more than 70 buildings. Registration figures for the 1941–42 session included 1,014 undergraduates and 55 graduate students, a total of 1,069. The teaching faculty numbered 137; the endowment fund as of

June 1941 was $5,356,354; the total college income for 1940 was $1,375,260. Gifts received during the year 1940–41 amounted to $66,306. (R. G. HA.)

Mowat, Robert Balmain (1883–1941), British historian, was born Sept. 26 in Edinburgh. During World War I he served in the naval intelligence department and in the secretariat of the war cabinet. He was professor of history at the University of Wisconsin, 1925–26, and at the University of Bristol after 1928; in Nov. 1940 he began a lecture tour of U.S. universities as a visiting professor, under the auspices of the Carnegie Endowment for International Peace. He was also a member of the British Library of Information in New York city. Among Mowat's many books on American and European history are *Europe in Crisis* (1936), *The Fight for Peace* (1937), *The United States of America* (1938) and *The American Entente* (1939). He was killed in the crash of a transatlantic ferry plane in Scotland, Sept. 1.

Mozambique: *see* PORTUGUESE COLONIAL EMPIRE.
Muang Thai: *see* THAILAND.

Muir, John Ramsay Bryce (1872–1941), British historian and parliamentarian, was a graduate of University college, Liverpool, and Balliol college, Oxford, and taught history at Liverpool and Manchester universities. He was a prominent member of the Liberal party and was elected to the house of commons from Rochdale in 1923. From 1933 to 1936 he held several important executive posts in the National Liberal party. In early 1941 he warned against any postwar move to split Germany into small states, maintaining that these fractions would eventually reunite and seek revenge. Among his publications are *Atlas of Modern History* (1911), *Britain's Case Against Germany* (1915), *America the Golden* (1927), *Political Consequences of the Great War* (1931), *The Interdependent World and Its Problems* (1933), *A Brief History of Our Times* (1934), *The Record of the National Government* (1936) and *Civilization and Liberty* (1940). He died in Pinner, Middlesex, Eng., May 4.

Mules: *see* HORSES.

Municipal Government. The experience of British cities in wartime showed that municipalities and their occupants might at any time find themselves in the forefront of the battle. Defense, however, of necessity had to be designed on a national scale. Hence it was the tendency in wartime for the lines of local and national government to coalesce at certain points. The events of 1941 precipitated this condition in American cities. The emergence of the cities as agents of the federal government in the increasing development of the civilian defense program overshadowed every other aspect of local government in 1941.

Civilian Defense.—The number of local defense councils jumped from about 1,500 in May 1941 to about 6,000 at the close of the year. The New England area had the largest number, while Texas had by far the largest state total. Some states, however, had not more than six each. The number of volunteer enlistments in civilian defense jumped from less than 1,000,000 in November to an estimated 5,000,000 following the attack on Pearl Harbor.

While responsibility for the ordering of blackouts and air-raid alarms was placed in the military authorities, trial or test blackouts were had on the order of local authorities, provided adequate advance preparations were made and warnings given. The adoption of blackout ordinances by municipalities in all strategic areas was urged by the Office of Civilian Defense (*q.v.*) and the army. Seattle was the first city to enact a blackout ordinance preparatory to a practice air-raid drill. Months of planning were required to blackout the city for 15 minutes. Pittsburgh, Pa., and to a lesser extent Boston, Mass., Newark, N.J., and El Paso Tex., also had demonstration blackouts earlier in the year. A 15-minute test blackout was held in Washington, D.C., the night of Dec. 30.

The concentration of war industry and military activities in certain communities created problems in some instances of major proportions due to shortages of housing, health and sanitation, education, recreation and other community facilities. An appropriation of $150,000,000 was made available to cities by the federal government in June 1941 for the construction and equipment of municipal public works to meet this need. The funds were available in the form of loans, grants or leases. Schools and school additions constituted by far the largest number of projects under this program, with recreation next. The federal government bore the entire cost of recreational buildings and facilities for the welfare of service men; in other cases the grants varied on the basis of the permanency of the need and the ability of the community to finance it. The grants ranged from 100% in a few cases down to about 40%, with the average somewhat more than 50%. A second $150,000,000 was in the process of being made available at the close of the year.

The extent of the effect of the defense program on cities—the outstanding municipal problem of the year—could not be foreseen. But its nature could be indicated. There were difficulties in securing priorities on materials and supplies requisite for the maintenance of municipal services; in the loss of employees through the draft and to defense industries offering higher remuneration; in municipal salary and wage increases due to the rapidly rising cost of living; in the expansion of community facilities—school, garbage collection, traffic signals and policing—in "boom" cities; and in some instances in "defense depression" due to curtailment of private industry of a nondefense character. The available studies of defense communities indicated that the defense spending program on the whole had an enormously stimulating effect on the economic life of local communities and that the adverse effects were—with certain exceptions—more anticipatory than real, or over-balanced in specific communities by the favourable factors, with the government actively intervening to counter the adverse effects in serious cases.

An American civil defense mission, consisting of two police officers, two city engineers, a health commissioner and an expert on housing and building, was sent to England to study the effect of total war on the civilian population and reported its observations and recommendations. Three battalion chiefs of the New York city fire department also visited London in the fall of 1940 to observe the methods used in the handling of incendiary bombs, and the department trained its men on the basis of their experience. London fire fighters returned the visit, especially to study American equipment. A board of disaster control in New York city, consisting of representatives of various city agencies dealing with the protection of life, health and property, worked out comprehensive safety plans. Similar agencies were set up in a number of other communities. Mutual-aid plans for the extension of water, police, fire and other services between neighbouring municipalities were worked out in a number of states.

The direct relationship between the national government and the municipalities appeared at other points of the defense program outside the Office of Civilian Defense. Priorities for municipal supplies, for instance, were handled through the state

and local government requirement branch, division of civilian supply, Office of Production Management (*q.v.*). By mutual agreement, the handling of "fifth columnist" enemy alien activities was left primarily to the Federal Bureau of Investigation (*q.v.*), with state and local governments rendering such assistance and co-operation as may be required. Special instruction courses were planned by the Federal Bureau of Investigation for municipal, state and other police administrators in a large number of municipalities to cover special wartime and emergency duties. The tire rationing system, under the Office of Price Administration (*q.v.*), was operated locally by tire-rationing boards designated by local officials in co-operation with the local defense councils. War insurance against property loss resulting from enemy attacks in continental United States was provided in Dec. 1941 through a federal war insurance corporation set up by the Reconstruction Finance corporation.

Greatly increased financial aid to municipalities for civil airports was being provided through appropriations to the Civil Aeronautics administration.

Defense Housing.—An acute housing shortage in defense communities developed during 1941. The situation was complicated by friction between the various federal agencies engaged in defense housing activities, whose relations were still unclarified at the close of the year, and by conflict between federal and local housing authorities over the question of local regulation of federal defense housing construction. The volume of residential construction increased to the highest levels since the late '20s. (*See* HOUSING.)

Finances.—The aggregate local government debt, exclusive of local housing authorities and of New York city, which increased its debt for the improvement of water supply and subway acquisition, declined 1.6% during 1940–41, according to a study issued by the bureau of the census in Dec. 1941. Other studies of municipal debt confirm this downward trend, in contrast to the marked increase in federal debt.

The defense program put a stop to capital improvements except as required for military or industrial developments. Many cities thus reduced their indebtedness, while a few rearranged their debt structure by refunding callable bonds at lower interest rates (*e.g.*, Detroit and Pontiac, Mich.; Kansas City, Mo.; Philadelphia, Pa.). There was a striking falling off in municipal borrowing by the last quarter of the year. Municipal bond sales in Oct. 1941 and Oct. 1940 were $25,000,000 and $120,000,000, respectively. Only one or two major improvement issues were voted on in the fall elections. Municipal bond prices reached an all-time high in Nov. 1941, but showed a marked decline in December due to the general market disturbance caused by the war. November and December showed the highest price levels and lowest interest yields in history (1.90% and 1.93%, respectively, according to the *Bond Buyer's* monthly index based on bonds of 20 large cities).

Municipal revenue collections continued to improve. Tax rates and assessed valuations were relatively stationary, except in the largest cities where the rates increased slightly and assessed valuations continued their slow downward trend. New York city decreased its sales tax from two cents on the dollar to one cent.

Relief.—One of the immediate effects of the national defense program was the removal of thousands of people from the local relief rolls.

Personnel.—Three significant surveys of municipal salary and wage increases indicated the classes of employees affected and the methods of increase utilized. A study by the International City Managers' association covered 27 cities, each having a population less than 300,000; the Milwaukee Municipal Reference library examined 21 cities, each having a population over 300,000; while the Municipal Finance Officers' association covered 384 reporting cities in different population groups. The great majority of cities acted in favour of wage or salary increases, particularly to the lower wage earners.

Progress continued in the public-service training of state and local employees. About one-seventh of such employees were reached in 1940; the majority were police and fire officers. The New York state program for 1940–41 showed a total enrolment of 36,268, an increase of more than 7,000 over the preceding year. More than 10,000 city employees enrolled in courses operated by the bureau of training of the New York city civil service commission. The bureau offered courses to representative city employees from all parts of the U.S. in Dec. and Jan. (1942) on the protection of vital utilities and city services during wartime. The Institute of Public Service was opened at the University of Chicago to make special training in various aspects of government available to public officials and employees and others in the Chicago metropolitan area.

A threatened strike of subway workers in New York city was averted when the city extended existing contracts made with the Transport Workers' union when the subways were in private hands, pending a court determination of the city's powers to contract with labour organizations in view of civil service regulations. Meanwhile, wage increases in the transit system amounting to more than $5,000,000 were granted in September. The case against collective bargaining agreements in public employment is strongly stated in a report of the National Institute of Municipal Law Officers (Aug. 1941).

Health.—The effect of the defense program has been to shift the emphasis of city health programs. Thus, city health departments administered tests for tuberculosis and syphilis in connection with the Selective Service (*q.v.*) act in co-operation with the army and local draft boards. Large supplies of serums or vaccines were prepared in anticipation of the outbreak of communicable diseases. Control of venereal disease was expected to be the main health problem in defense communities. An intensive nutrition education campaign was launched in 1941, stressing the importance of a scientifically adequate diet for everyone. More than 300 new workers were given intensive courses on the special health problems of defense areas by the U.S. public health service to meet the increased need for personnel in state and local health departments.

Safety.—*See* ACCIDENTS.

Crime.—*See* CRIME.

Elections.—Interest centred chiefly on the proportional representation cities, seven of which held their regular biennial proportional representation elections in 1941. Cambridge, Mass. elected a proportional representation council for the first time; the remaining cities were: New York and Yonkers, N.Y.; Cincinnati, Toledo and Hamilton, O.; and Boulder, Colo. Legislation was adopted in Massachusetts enabling Boston to adopt proportional representation, and a campaign was being planned for 1942. The New York city vote gave representation to nearly 500,000 more voters than had ever elected aldermen under the old plan, and placed three women, one Negro and one communist on the council. Some very influential voices were raised against proportional representation during the year. Out of the 23 referenda on proportional representation held in cities of the U.S., however, 21 upheld it. (*See* also ELECTIONS; PROPORTIONAL REPRESENTATION.)

City Manager Plan.—Eighteen cities in the U.S. adopted the council-manager plan in 1941. The plan was in effect in a total of 513 cities and 6 counties of the country as of Dec. 31, 1941. A vote on its abandonment was held in five cities; it was retained in each case.

Postwar Planning.—The defense program had its counterpart in the plans under way for the resumption of peacetime activities when war ended. Cities were planning to make their contribution to maintaining full employment during the transition to a peacetime basis. One of the outstanding provisions for this purpose was the establishment of a public work reserve, announced June 23, 1941, sponsored by the Federal Works agency, cosponsored by the National Resources Planning board and operated by the Work Projects administration. Its purpose was the establishment of a national shelf of work projects to be undertaken by local, state and federal agencies when needed in the postwar period. Headquarters were in Washington, D.C.; there were four regional field representatives: an eastern, southern, central and western; and 43 state (or combination of state) administrations, each under a state director and each divided into two sections: a construction or capital improvements section and a nonconstruction or public services section. Assistance was given to state and local governmental units in preparing long-range public improvement programs on a priority basis of actual need or expediency and in making the requisite preliminary studies. Programs were on a six-year basis for each community, with one year of actual budgeted improvements and five years of planned work beyond, subject to continuing review and revision of the inventory and program. An incentive was thus furnished to local governments to plan, so as to be ready to meet the exigencies of the postwar future.

One area of postwar activity in metropolitan centres was the rehabilitation of blighted areas, estimated to have spread to one-fourth of urban U.S., including property assessed at approximately $20,000,000,000 and involving the welfare of about 50% of the urban population. In New York city alone 7,671 acres were designated by the planning commission as sub-standard. Large-scale replanning and rebuilding, including adequate housing, were called for through a combination of private enterprise and public authorities, possibly with federal financial assistance. The New York state urban redevelopment corporations law, enacted in 1941, permitted municipalities to offer special inducements to private corporations to undertake large-scale development of such areas, subject to suitable local controls; similar legislation was adopted in Michigan and Illinois.

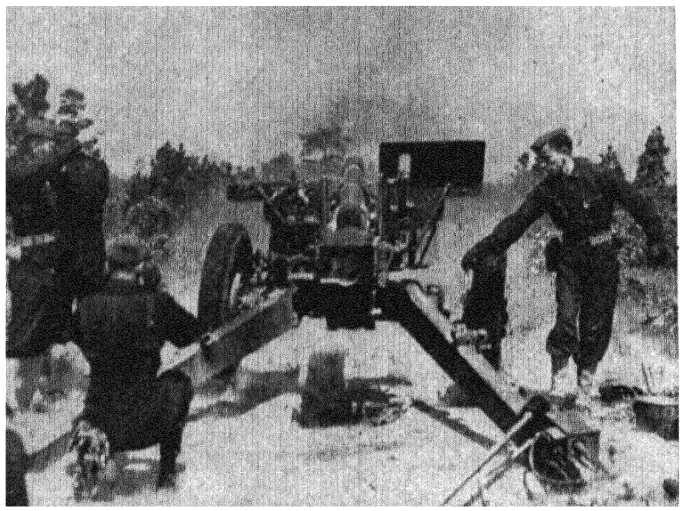
Miscellaneous.—The year 1941 marked the publication by the National Municipal league of its 5th revision of the *Model City Charter*, first issued in 1900; the holding of the second Inter- (formerly Pan) American Congress of Municipalities at Santiago and Valparaiso, Chile, which adopted a program for municipal co-operation in promoting inter-American friendship; the creation of a bureau of urban research at Princeton university to serve as a clearing house of information and research to those concerned with urban problems; a notable survey of local government in Chicago by civic organizations, which resulted in measurably reducing the city's operating budget for 1941; and the inauguration of a study by leading tax experts, under the auspices of Secretary of the Treasury Morgenthau, to examine the whole field of federal-state-local fiscal relations.

(L. GU.)

Munitions of War.

In 1941, the business of munitions making became, for the first time in history, the primary occupation of civilized man. For although in the course of that year but 15–25% of all production had gone, in the United States at least, into war goods (in 1940, only 7%), a program was already in effect which, in 1942, would see this figure increase to 49%—in 1943 to 54%. And so the American citizen who, on Jan. 1, 1942, was feeling the first impact of the new order in the form of a strict rationing of rubber (automobile tires), perhaps gained therefrom a faint glimmering of more and sharper curtailments yet in store.

Nevertheless, the United States, self-constituted "Arsenal of Democracy," faced the year without trepidation, confident that means would be found to produce in sufficient quantity, and



NEW 105-MM. HOWITZER of the U.S. army which began to replace the older 75's in 1941

within the time limits imposed by the exigencies of a world war in which she was now a participant, the munitions requisite to the overthrow of the axis powers. For most production schedules had been met—many surpassed. Considering the several categories involved, we find:

Aircraft (Army).—About 2,320 military planes by 1941 had been America's "huge" program of 1938. But as 1941 ended, her quota of 18,000 ships for the year was practically assured. This was to be increased in 1942 to 30,000, while by the end of 1943, a monthly output of 3,600 planes of all varieties was counted upon.

As in the past, engine horsepower ratings, armament, speed and ultimate ceilings continued to expand. Single motors of as many as 18 cylinders and developing well over 2,000 h.p. were relatively numerous, and though official figures indicated few maximum speeds of over 400 m.p.h., aero engineers quietly estimated that at least one newcomer averaged between 540 and 580 m.p.h. The typical fighter (in the U.S. army air corps uniquely designated "pursuit") was a single-seat monoplane of all-metal construction with a speed in the vicinity of 400 m.p.h., ceiling of 30,000-35,000 ft., weight loaded of 5,000-7,500 lb., range of 600-1,000 mi. and a motor of around 1,000 h.p. Its .30 calibre machine guns were generally augmented by others of .50 calibre, plus frequently one or several small cannon of 20- to 37-mm. bore. Fire power was truly enormous, some (British) planes mounting as many as twelve .30-calibre pieces. Wing cannon too were coming to the fore, and of this type, the United States had adopted the 20-mm. Hispano-Suiza (with a cyclic rate of 575 rounds per minute). Of especial significance was the fact that its planes were now credited with possessing a secret fire control device of great exactness. For high-altitude operations, her "turbo-supercharger" embodied a turbine driven by engine exhaust gases, which compressed the rarefied air of the substratosphere, permitting motors to "breathe" without loss of power. To combat the physiological "blackout" experienced by pilots in power dives at tremendous speeds, tests were being conducted with ships controlled by pilots flying in a prone, rather than a sitting, position. The U.S. army had officially adopted a dive bomber (a modified navy product), and its air corps, now granted a considerable measure of autonomy, was devoting no little attention to ships of that type. In the field of high-altitude bombers it launched the Douglas B-19, world's largest, with a wingspan of 212 ft., weight, loaded, of 164,000 lb., four motors totalling 8,000 h.p., and capable of carrying 18 tons of bombs. The army was also pushing the production of transport planes, whereas Germany was credited with 1,000-1,200, each capable of carrying 25 men with full equipment. The parachute soldier had become a fixture in all first-rank military establishments. Glider transport also was everywhere receiving serious study. On Aug. 2, the first American organization of a new type, the 550th air-borne battalion, had been activated. Later (October) the 80th U.S. infantry-air-borne took shape. Meanwhile the marine corps commenced to train its own parachutists at points on east and west coasts.

Where no prepared fields were available, U.S. army planes were finding an efficient substitute in "Marston landing strips"—perforated sections of thin steel sheeting which could readily be hooked together to form a flat surface capable of receiving, for landing or take-off, ships of every type from smallest to largest. Safety of the individual aviator was promoted through the development of a new fire extinguisher whereby the pilot, pulling a lever, could blanket the entire engine compartment with flame-choking carbon dioxide.

Crystal clear, as the year 1941 ended, was proof of the fact that the aeroplane was more than an unfulfilled threat to the backbone of a nation's naval power—the capital ship. This was brought home with frightful force as the year drew to a close by the sinking or capsizing through enemy air action of a number of the mightiest ships of the world's great navies. (*See* WORLD WAR II.) In these engagements the torpedoplane played a significant, sometimes a predominant part, though high-altitude and dive bombers were by no means unrepresented. Proved too, were any proof needed, was the importance of the aircraft carrier, lacking which Japan could not have placed within striking distance of their objective the 150 to 300 planes which executed the attack of Dec. 7 on the United States forces at Oahu, an event which destroyed for all time that complacency with which the average American had previously viewed the possibility of air invasion from overseas. Even New York city awoke to the practicability of an assault by Germany's "Heinkel 177" bombers, of which it was known to possess 150 not theretofore employed. These, with a range of 7,040 mi., could readily make the round trip from certain points in occupied France but 3,320 mi. distant from the Atlantic coast metropolis, as might, from a sea-borne carrier, Dornier flying boats (5,040 mi. range) or Italy's 100 or more Savoia Marchettis. For despite its increasing production rate monthly as 1941 ended, the United States was as yet in no position to defend itself at all points.

Aircraft (Naval).—A naval torpedoplane was responsible for the sinking (May 27) of Germany's 35,000-ton "Bismarck," pride of its postwar navy. Its location betrayed by a patrol bomber and its steering gear disabled by an air-borne torpedo, it became easy prey to the swarm of surface vessels which quickly assembled for the kill.

The U.S. navy, which in mid-1940 had set itself a goal of 15,000 planes for its air service, acquired during the fiscal year 1941, some 2,059 aircraft of all types as against 306 in the year preceding. Launched on Nov. 8, the "Mars," navy's counterpart to army's B-19, carried four 2,000-h.p. motors, weighed with full load 135,000 lb., and was capable of round-trip, nonstop cross-Atlantic flight. Its wingspan was 200 ft. A glider program was under development with two-place trainers and 12- and 24-place carriers on order. (*See* AIR FORCES OF THE WORLD.)

Anti-Aircraft.—To its already formidable array of anti-aircraft weapons the army added two new types—the 40-mm. Bofors piece, of Swedish ancestry, and the 4.7-in. gun. Characteristics of the former included a rate of fire of 120-140 shots per minute with a 4¾-lb. cartridge, the explosive projectile of which ranged to 11,000 yd. horizontally or 5,400 vertically. Of the 4.7-in. gun, "super-super" among existing anti-aircraft weapons, little information was available, though unofficial accounts credited it with a vertical range of well over 40,000 ft. And since aircraft were not yet prepared to operate at such an altitude, this development served once again to bring the highest-flying ships within reach of defensive artillery. And a partial answer to the threat of the dive bomber and other low-flying attack planes, the speed of which rendered them at close range almost immune to the fire of guns lacking instant manoeuvrability (a characteristic not possessed by the heavier types of anti-aircraft weapons), was found in mounting MG's of .50 calibre and machine cannon of 20-mm. bore in multiples of four "pom-poms." In another field of anti-aircraft activity the United States launched its first barrage balloons at Camp Davis, N.C., in September. Meantime, the marine corps, not to be outdone, had organized and put in operation its own balloon barrage school at Parris Island.

Air Bombing.—High-explosive ("HE") air bombs in general use varied from 100 to 2,000 lb. in weight. Striking in sandy loam, the former produced craters 6 ft. deep and 20 ft. in diameter, while the latter excavated areas 36 ft. in depth and 50 ft. across, their splinters being dangerous over distances of 200 to 1,200 ft. respectively. These figures referred to bombs with delayed-action fuses which permitted them to burrow deeply before exploding. (With an instantaneous fuse the penetration figures were but 2 and 7 ft.; crater diameters 9 and 22 ft.) For protection against direct hits by these missiles, 2.4 in. of concrete or 5 in. of steel were required in the case of the 100-pounder; 11.6 in. of concrete, or 15 in. of steel for the larger. In the remote instance of a direct hit by the fortunately very rare 4,000-lb. bomb, no less than 100 ft. of normal earth or 50 ft. of solid rock were necessary to assure safety. Hits were of course easier to accomplish with projectiles dropped from low altitudes, but under such conditions the penetration was materially reduced, since the terminal velocity of a bomb dropped from 20,000 ft. was exactly double that of one released at 2,000 ft. And since bombs of all types acquired the forward velocity of the planes discharging them, they ranged onward for great distances from their points of release, making it possible for aircraft to "shoot and run" without the necessity of flying directly over chosen objectives. Thence arose the necessity for rings of barrage balloons and A.A. guns at considerable distances from the objects of air attack if these were adequately to be safeguarded. Reliable estimates indicated that a missile of 600-660 lb. (perhaps the most commonly employed heavy type) would destroy the top four or five floors of a modern steel skyscraper, persons sheltered on the lowermost four or five being likewise subject to injury by splinters from missiles landing in the streets. Intermediate floors were considered, however, practically danger-proof.

	ARMOUR PIERCING	DEMOLITION	FRAGMENTATION	AERIAL MINE	INCENDIARY LIGHT	INCENDIARY SCATTER	GAS
Usual weight	1100 lbs	550 lbs	30 lbs	2000 lbs	2 lbs	30 lbs	30 lbs
Range of weight	200-4000	100-4000	17-2000	1000-5000	2-60	17-500	30-600
Sectional pressure	9.7	3.1	2.0	-	0.3	1.5	1.5
Percent of explosive	10-15	40-60	15	90	-	-	-
Terminal velocity	1400 ft/sec	1100 ft/sec	725 ft/sec	-	350 ft/sec	-	-
Penetration	Excellent	Good	Poor	Poor	Poor	Fair	Poor
Blast	Reduced	Heavy	Light	Extr heavy	None	None	None
Used against	Warships and special targets	Buildings bridges and military concentrations	Personnel and transport	Wholesale demolition of weak structures over wide area	To cause fires for direct damage and to illuminate the target		Personnel contamination

VARIOUS TYPES OF BOMBS and their properties (from *Bulletins of the National Archives*)

Security against splinters from fragmentation bombs was offered by shelters with walls of 1½ in. steel and covers of ½ in. of that material, but these were obviously overheavy as well as quite expensive, and equal protection was to be had from a light framework covered with a 2-ft. thickness of sandbags. The employment of gas bombs, not thus far indulged in during World War II, remained an obvious possibility, but still rather improbable, since high-explosive missiles of equal weight had been found far more effective. If used, they probably would contain mustard gas—the more fatal phosgene type releasing fumes of very short persistence. Incendiary bombs, thousands of which had rained on London in Sept. 1940, causing some 20,000 fires in that city, commonly weighed 1 kg. (2.2 lb.) and embodied a thermite mixture in an "Elektron" case, the latter alloy consisting of 86% magnesium, 1% copper and [illegible]% aluminum. The charge of thermite (76% powdered iron mixed with 24% powdered aluminum) burned for about a minute, developing the terrific temperature of 3,000° C., and meantime igniting its Elektron container. This in turn blazed for an additional 12–15 min. Before the thermite was fully consumed, the bomb proved difficult to quench, since that compound carried within itself the oxygen necessary for combustion and was not compelled to borrow this from the surrounding air. Once it was exhausted, however, the flaming Elektron jacket could be extinguished with an asbestos snuffer or by the simple expedient of covering it with sand, since that alloy did rely on air oxygen for its continued combustion. Dousing the white-hot missile with water during the first minute proved risky business, for this promptly caused it to burst into many fragments, each in turn starting its own small conflagration. Later, however, water could be applied to advantage since it fed so much oxygen to the flame (on contact with which it broke down into its chemical constituents), that the whole was consumed in 4–5 min. instead of thrice that period. For the release of a number of fire bombs from a single container, the Russian "Molotov breadbasket" proved a fairly satisfactory medium. Once dropped from aloft, retarding vanes caused it to descend relatively slowly, centrifugal force throwing out its load of 10–12 dozen bombs a few at a time as it spun upon its axis, these to scatter and land over a wide area.

The Tank.—Experience showed that the light tank did not stand up in warfare as would a medium heavy model and that air-cooled types were highly desirable in desert operations where water was worth its weight in precious stones. It showed additionally that hits from moving tanks were extremely difficult to achieve (the Germans recognized this by halting their vehicles when ready to fire); and that the steel treads of the best European types would endure only about 800 mi. of African campaigning. Further, it had long demonstrated the fact that tanks with riveted hulls might become death traps, the rivets shearing loose when the body received a direct hit, and flying about as secondary missiles to wound or kill members of the crew. Profiting by these observations, the United States supplied its tanks with a secret fire-control device said to increase by 500% the number of hits made from a machine in motion, powered them with air-cooled gasoline motors, fitted them with moulded rubber caterpillar treads good for 2,000–2,500 mi. of hard wear, and replaced rivets with welds (70%) and castings (30%), the last-named method representing tremendous saving in time and effort. Contours were rounded to reduce the chances of direct hits and armament was made more powerful. The three types upon which it had standardized included light, medium and heavy classifications, with the following characteristics:

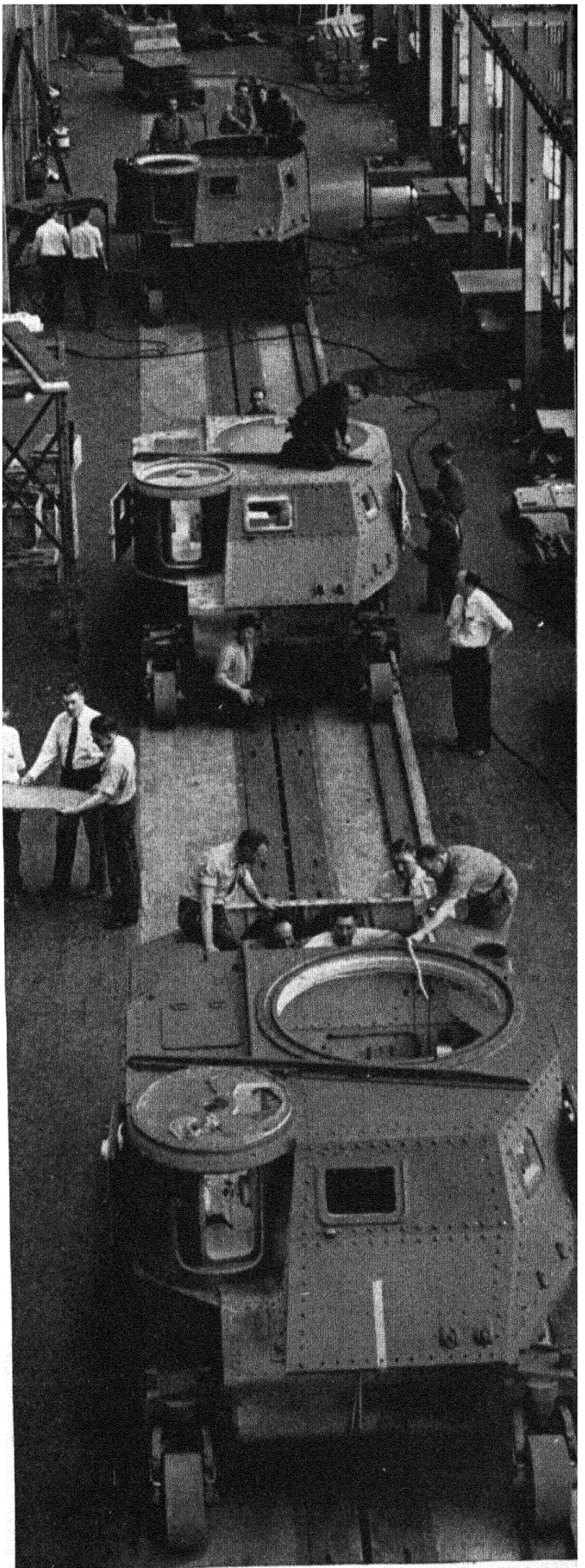
	Light	Medium	Heavy
Designation	M3	M3	M1
Weight	13.5 tons	25–30 tons	57–60 tons
Horsepower	200	400	2,000
Speed	45 m.p.h.	30 m.p.h.	25 m.p.h.
Crew	3 (?)	6	7
Armament	37-mm. gun & MG's	75-mm. gun; 37-mm. gun; MG's	75-mm. gun; 37 mm. gun; several MG's

Anti-Tank.—Observations made in Europe and Africa indicated that, when meeting on equal terms, the anti-tank gun had been superior to the tank. Determined to profit by that fact, the U.S. army announced, late in 1941, the formation of 52 "tank destroyer" battalions, using personnel and matériel from existing anti-tank units to build upon. Three types of such battalions were to be formed; viz.:

Light, with towed weapons, assigned to foot divisions.
Light, with self-propelled weapons, assigned to cavalry and motorized divisions.
Heavy, for armoured divisions, army corps and armies.

The equipment of one typical battalion included 36 armoured half-track cars mounting 75-mm. guns, 18 "jeeps" and "swamp buggies" (*see* section *Motor Transport*) carrying 37-mm. guns and 10 light tanks. Crews of four handled the half-tracks, which weighed 7,500 lb., possessed two-way radios, and were capable of 50 m.p.h. on good roads, not to speak of considerable cross-country manoeuvrability. The .50-calibre machine gun, no longer able to penetrate modern tank hulls, was being replaced by 37-mm. guns among cavalry special troops, and the general trend in anti-tank weapons the world over was toward heavier calibres and speedier movement. Against these marks of progress could, however, be recorded the fact that in August of 1941 the U.S.A. had a much smaller total of tanks on order than Germany and Russia, who were then credited with 30,000 each.

Army Organization.—The United States enlarged the number of its armoured divisions to five, each of 12,697 officers and men, and equipped with 158 light and 232 medium tanks. Motorized divisions were increased from one to two, with more proposed. These differed chiefly from the "triangular" (foot) divisions in that they possessed for each regiment, 201 half-track personnel carriers. To strengthen the motorized type a number of self-propelled howitzers were supplied to its infantry units, and



THE FIRST 28-TON M3 MEDIUM TANKS rolled off Chrysler's assembly line in Detroit two months ahead of schedule in 1941

its reconnaissance strength expanded by some 106 light and medium tanks and 452 bantam cars, while the addition to each support battalion of a mine company (to lay and recover mines and remove hostile types) was also under consideration.

In November the beginnings of a force of United States mountain troops were constituted. Originally scheduled to total 35,000, the figure was later amended to cover but a single reinforced regiment of 5,000—the 87th infantry, with an initial strength of some 800 officers and men.

As the year 1941 ended, the United States could point to an army of almost 1,750,000, with 34 divisions activated (including an armoured force of 5 divisions, 2 motorized divisions and 15 independent tank battalions) as against Germany's estimated forces of 4,500,000 distributed among some 260 divisions, 20 of these armoured. (*See* ARMIES OF THE WORLD.)

Navy.—By Dec. 1, 1941, the United States had committed itself to the construction of a two-ocean navy of some 687 fighting vessels which included:

32 battleships	
18 aircraft carriers	362 destroyers
91 cruisers	184 submarines

Three hundred and forty-three of these were already in commission; 341 more were being built or on the drawing board. The program thus far developed called for an expenditure of $7,500,000,000 in ships, plus another $1,000,000,000 for enlarged shore facilities. Inclusive of the major fighting units listed above, the fleet as then planned was to total 5,334 vessels, for the combatant elements, among which some 1,333,000 tons were already built, with more than 2,000,000 more authorized. The maritime commission, too, was doing its share and as the year ended, the total of merchant ships being built reached well over 700. As in the case of the tank, the rivet, so far as the shipbuilding industry was concerned, was fast giving place to the weld, with an average reduction of 13% in deadweight, not to mention the saving in time and effort.

The threat of the "magnetic" mine, one of Germany's secret weapons launched early in the war, was now dissipated through the general installation on naval vessels of "DeGausse" girdles—systems of electric cables which neutralized the ship's magnetic field. Alive to the danger of underwater attack, naval constructors were producing capital ships capable of withstanding four or five torpedo hits and remaining afloat. Of this type was the "Bismarck," which did not succumb until after receiving seven such blows, not to mention 20 others by 15-in. shell and more than 300 additional from missiles of 8-in. calibre.

The Submarine.—The United States, in order to take advantage of shipbuilding facilities wherever they existed, undertook to construct submarines on Lake Michigan, floating the finished vessels down the Illinois and Mississippi rivers to the sea. But the submarine sensation of the year was the "2-man" type, employed by Japan in her combined naval and air attack on Oahu on the morning of Dec. 7, in the course of which three of these small vessels were destroyed. Whether these tiny contrivances had inflicted serious damage on any American vessel or vessels was not revealed, but the fact that Japan had been able to keep their existence a close military secret constituted, in itself, a minor victory. (*See* BLOCKADE; SUBMARINE WARFARE.)

Arms and Explosives.—For the erection of new plants and the enlargement of existing installations devoted to the production of smokeless powder, T.N.T. (a shortage of which existed) tetryl, picric acid, ammonium nitrate, small arms ammunition fuses, armour plate, machine guns and aeroplane cannon, and for the loading of shells, bombs and powder bags, the U.S. ordnance department had expended by Dec. 1941 some $2,000,000,000. Developmental work was being carried on at six permanent arsenals, at the Aberdeen proving ground and by 450 private concerns producing ordnance matériel. Procurement plans for ordnance items were being prepared from studies made by the office of the chief of ordnance, the Army Industrial college, the army-navy munitions board and the planning branch of the undersecretary of war. U.S. production of smokeless powder had risen 1,000% during 12 months, of small arms ammunition, 1,200%. The awarding to various manufacturers of "Educational Orders" as authorized by congress in 1939 had developed sources of materials and components and familiarized many manufacturers with governmental inspection methods, and the "production studies" elaborated to supplement these, while providing for no actual manufacture, did serve to instruct various industrial concerns in the technique of fabricating certain important items. Ten new ordnance storage depots, in addition to 11 already in operation, were under construction. The money value of ordnance matériel delivered to the army in Oct. 1941 was eighty-fold that of May 1940, and was to be increased to 360 times the 1940 figure by June 1942. Sixty-seven government-owned ordnance plants were either in operation or on the way. In addition to new types under construction, quantities of World War I artillery of calibres from 75 to 250 mm. were being restored for service. Third in priorities (following the navy and air corps) the ordnance department had a "shopping list" of 1,200 major items—involving some 200,000 components. Plastics were replacing wood in pistol and bayonet grips and on slide handles of machine guns. The Garand semi-automatic rifle was coming from production lines in gratifyingly increased quantities. The army, observing that a goodly percentage of the world's nonrifle-carrying fighting men were being supplied with machine pistols or submachine guns in place of the revolver and automatic pistol, went a step further and announced that the Colt .45 automatic pistol, its official side arm since 1911, was on the way out as a weapon for enlisted men, and for officers below the grade of major—to be replaced by a new semi-automatic carbine of Winchester make, selected after exhaustive tests participated in by a number of competing models. (It had already purchased and issued in great numbers, submachine guns to selected units.) Characteristics of the newcomer included a weight of 4.6 lb., barrel length of 18 in., and over-all length of 35 in. (Other military submachine guns to which this was comparable weighed 9 to 10 lb., and the light weight of the new piece was hailed as an engineering achievement.) Loading was from a conventional box-type magazine holding 15 cartridges of .30 calibre, with 110 grain bullets. Muzzle velocity was 1,900 f.s., and the accuracy range 300 yards and better, as against 50 yards for the pistol. Eighty per cent of the soldiers then carrying the latter arm were to be issued the carbine in its stead, the estimated increase in fire power of an infantry regiment so equipped being around 33%. The first complete battery of 90-mm. A.A. gun carriages to be produced commercially was delivered in October. Provisions for storage of explosives were keeping up with the manufacture of these, and during one 24-hour period in September, "igloos" (special concrete storage buildings with floor dimensions of about 26x60 ft.) were being poured at the rate of one per hour at a certain ordnance depot. Cotton had largely replaced the now practically unobtainable silk as cartridge bag cloth, though tie straps were still of the latter material, which remained also in use for bagging charges for guns of super-heavy calibres. Yet, notwithstanding all the progress recorded, "Quaker" guns were still badly needed for training purposes while the real articles were being produced, and one Ordnance Maintenance shop (July 1941) was running three 8-hour shifts to turn out dummy 37-mm. guns and 81-mm. mortars for the use of the division to which it was attached.

Artillery (Coast, Railway, Field).—A newly developed United States 6-in. coast defense gun had all-around traverse and was covered by a streamlined steel "hood" affording a high degree of protection to its crew. The first 8-in. railway artillery gun mount to be made since 1918 was accepted in Feb. 1941. More were coming. Five new diesel-driven locomotives were purchased by the engineers and turned over to the coast artillery corps for the use of railway artillery organizations. Self-propelled artillery in calibres of from 37 mm. to 155 mm. was being developed by the ordnance department for use in the field, where divisional artillery embraced guns and howitzers of 75 mm. and howitzers of 105 mm., corps artillery comprising the heavier 155-mm. gun and howitzer (a revised, long-range model of the latter was standardized during the year); supplemented by a new piece of 4.5 in., relatively light for its calibre and capable of many missions including anti-tank work. The famous "75" field gun of World War I was fast being supplanted for most purposes by the 105-mm. howitzer. The latter weighed but 1,200 lb., had a barrel 8 ft. in length, and was usually truck-drawn. It could go into firing position in a space of 3 minutes and throw a 33-lb. shell (over twice the weight of that of the "75") to a range of 13,600 yd. (almost equal to that of the "75"). The first such weapon to be produced from commercially made parts was delivered in October. Manufacturing technique as applied to the 37-mm. gun carriage had been greatly improved by the adoption of welding to replace older and less satisfactory methods. The first 155-mm. gun to be made outside of a government arsenal was delivered in October. It possessed a range of about 15 mi., almost 50% more than that of World War I vintage. A gun of this type, towed by a 7½-ton prime mover, covered a distance of 951 mi. at an average speed of 33.2 m.p.h.—hitting 75 m.p.h. at one point.

Engineers.—British engineers devised reinforced concrete covers to be placed over generators in power houses, which proved able to stand up under two direct hits. United States engineers produced a new demolition kit for the use of parachute troops. Extremely light, it contained a score of T.N.T. blocks, together with the necessary accessories—safety fuses, cap crimpers and blasting caps, the last isolated from each other and from the remainder of the contents by pads of sponge rubber. For bridging rivers U.S. engineers employed aluminum pontons of 1,400 and 2,800 lb. weight, the former sustaining a 10-ton load, the latter, one of 25 tons. This heavier type was carried on a newly designed semitrailer, as issued to the 87th engineer battalion, the first heavy ponton unit to be organized in the U.S. army. For highway bridging, it employed portable steel units of 10- and 20-ton capacity. River crossings were undertaken in plywood assault boats of 11-man capacity, to be paddled across small bodies of water by their occupants. Ten of these small vessels could be nested and transported on a 1½-ton truck. Motor-driven assault boats were under development by the engineer board. The first water-supply unit to take shape since World War I, the "80th engineer battalion—water supply," was organized in July. Personnel included 19 officers and 407 men—matériel, 9 water purification tank trucks and other vehicles. To develop its railway engineer troops, the United States government purchased a 60-mi. railroad in Louisiana and undertook to extend this by a 17-mi. addition, the whole to be operated by the "711th engineer battalion—railway operating."

Communications.—In July, United States authorities announced that "electric sentries" operating on radio beams were shortly to be installed along its coasts. Capable of spotting invading planes at ranges of many miles and of recording their altitudes, heights and distances from points of observation, they were patterned on a principle already used with success by the British. The U.S. army signal corps achieved an object long sought but never previously attained—two-way communication by carrier pigeon, the birds delivering messages and then returning to their starting points (with replies when required), over distances as great as 12 mi. A new radio truck with an operating radius extending (even when it was in motion) to 250 mi. was being developed. (Ranges of previously existing field radios were generally circumscribed so that those functioning on the same frequency might not interfere with one another, and frequency bands were, of necessity, limited.) New radio equipment was largely pushbutton operated. European armies had developed for their mountain troops, which possessed little telephone equipment (but many radios), a "visible telephone" over which conversations travelling on ultraviolet rays could be held at distances up to two or three miles, though the apparatus involved was cumbersome, and stations had to be sighted carefully upon one another.

Body Armour.—The U.S. army had developed a new helmet which weighed 2½ lb. (3 oz. more than the World War I type). Delivery of enough of these to supply several divisions commenced in December. It embodied a fibre lining which could be worn separately; was much cooler in use, and easier to keep in place than its predecessor. Further, it covered 80% more of the head surface than did the latter. Meantime, the navy was elaborating on a somewhat heavier model (4 lb.) lined with sponge rubber, which gave a high degree of protection and permitted the wearing of a set of headphones at the same time. Special anti-barbed wire gloves were being perfected by the engineers, their palms lined with two layers of horsehide.

Reports from England stated that a complete set of body armour (chest, abdomen and leg plates), weighing but 3 lb. and capable of stopping "tommy gun" and pistol bullets, had been produced and distributed to several divisions of its troops. American authorities were very doubtful—thought that such an outfit must weigh more than 10 lb. at the very least.

Medical Services.—The U. S. war department was seeking donors of 200,000 half-pints of dried blood plasma for emergency use in cases requiring transfusions. The employment of this substance in place of whole blood represented a great advance, as it could be administered without prior matching of blood specimens from donor and recipient. New first-aid devices included, for the German soldier, a sterile bandage located in a handy inside pocket at the bottom of his blouse; for the U.S. soldier, a small metal box which could be opened with either hand to release, one at a time, germicidal tablets containing one of the new "sulphur" drugs, for direct application to injured tissues. Fully equipped mobile surgical field hospital units, transported in 14 motor vehicles and capable of handling 80 operations in 24 hours, stood up under field tests. "Hospital ward" and "hospital unit" cars, the former with capacities for handling 32 patients, the latter fitted with complete examining and operating, administrative and kitchen facilities, plus quarters for the staff, were to be added to trains of standard Pullmans for the transport of sick and wounded. And based on an army of 1,400,000 within its continental limits, the United States was providing 70,000 beds in some 200 station hospitals scattered from the Atlantic coast to the Pacific coast.

Motor Transport.—The first crossing of the Sahara by motor vehicles producing their own gas from charcoal in special generators was accomplished by a French truck convoy which covered altogether 4,000 km.—1,800 of these across desert wastes. Japan was installing diesel motors in trucks and buses. The United States, planning for an army of more than 2,000,000 men, was buying multiwheel-drive vehicles by the scores of thousands. These included the "jeep," a small multipurpose combat vehicle of which several thousand had been issued by November and many thousands more ordered. With a length of 11 ft., width of 56 in. and height of 40 in., it weighed 2,200 lb. and cost but $900. Doors were replaced by "safety straps." While the crew regularly numbered three, six could be carried in an emergency. With six speeds forward and two in reverse, its 4-cylinder, 60-h.p. motor drove it at 60 m.p.h. and better on roads, 50 m.p.h. "cross country." Armament consisted of MG's of .30 or .50 calibre, or one 37-mm. gun, which was mounted sometimes facing forward, sometimes to the rear. An improved type, with 4-wheel steering as well as 4-wheel drive, capable of turning in an 11-ft. radius, was adopted during the year. The so-called "swamp buggy" was in effect a "super-jeep," with a similar low silhouette. Its chassis underslung, it carried a 37-mm. gun and was powered by an engine mounted in the rear of the body. Larger and heavier was the new ½-track scout car which boasted three .30-calibre MG's and was capable of a cross-country speed of 45 m.p.h.

Basic Materials.—Apart from facing the necessity of increasing, with lightning rapidity, its output of synthetic rubber if its citizens were to continue to enjoy, even in reduced measure, the advantages of motor transport, the United States was confronted by shortages in many types of essential materials—some serious, some merely irritating. These embraced various of the basic metals and extended also to certain iron alloys and machine tools. Substitutes for practically all these were hurriedly being developed. Thus the Radio Corporation of America had evolved over 40 replacement items for strategic materials in radio sets, one of which alone had saved 148,000 lb. of aluminum, and more than 20 of which were in actual use. Even "substitutes for substitutes" were appearing—as evidenced by successful efforts to devise new compounds to replace certain plastics.

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Murphy, J. Harvey (1882–1941), U.S. clergyman, was born April 28 in Paterson, N.J. He took his M.A. degree from the New Brunswick Theological seminary in 1909 and received a D.D. degree from Central College, Pella, Ia., in 1924. He was ordained to the ministry of the Reformed Church in America in 1909, served as pastor in Philadelphia, Pa., Amsterdam, N.Y., and Jersey City, N.J., and in Hudson, N.Y., 1921–41. He was president of the General Synod, Reformed Church in America, 1938–39. He died in Hudson, N.Y., Sept. 19.

Murray, Charlie (1872–1941), U.S. stage and screen comedian, was born July 22 in Laurel, Ind. After 20 years on the stage, he joined the Biograph company in 1912 and was one of the "Keystone Kops" of early silent-screen fame. Murray emerged from his minor roles to co-star with George Sidney in a series of talking picture comedies, *The Cohens and the Kellys*. After the popularity of this series waned, Murray was seen in a number of short comedies. He died in Hollywood, July 29.

Murray, Philip (1886–), U.S. labour leader. A native of Scotland, he was born in Blantyre May 25 and emigrated to the United States in 1902. Naturalized in 1911, he became a member of the international board of the United Mine Workers of America the next year, president of the union's fifth district in 1916, and international vice-president in 1920. During World War I he was a member of Pennsylvania's regional war labour board and served also on the National Bituminous Coal Production committee. In 1935 he was named to the National Industrial Recovery board and to the advisory council of the National Recovery administration. Murray was John L. Lewis' choice for second president of the C.I.O. after Lewis had fulfilled his pre-election promise of 1940 to resign if President Roosevelt was elected for a third term. Lewis, who continued to dominate the annual convention of the organization, personally nominated Murray, and the latter was elected unanimously Nov. 22, 1940, without an opposition candidate. Murray then announced that he would conform strictly to the policies outlined and followed by his predecessor.

Murray, however, did not follow Lewis during 1941 in the latter's bitter opposition to President Roosevelt's foreign policy. The new C.I.O. leader stood for aid to Britain (though he criticized certain parts of the lend-lease act and said the U.S. should be determined not to enter the war). By the time of the national C.I.O. convention in Nov. 1941, a split between the Lewis and the Murray forces was evident. Lewis' supporters, however, joined the other factions of the C.I.O. in re-electing Murray for a second term as president Nov. 21, 1941, at Detroit.

Murray, Samuel (1870–1941), U.S. sculptor, was born in June in Philadelphia, Pa. A pupil of Thomas Eakins at the Art Students league, he worked for a while as Eakin's assistant and became an art teacher in 1891. His works include the statue of Commodore Barry in Philadelphia, the Bishop Shanahan memorial in St. Patrick's cathedral, in Harrisburg, Pa., and the Pennsylvania State Battle monument at Gettysburg, Pa. He is represented in the Philadelphia Museum of Art and the Metropolitan and the Whitney museums in New York city. Murray taught life modelling and lectured on anatomy at the Moore Institute of Arts, Science and Industry in Philadelphia for nearly 50 years. He died in Philadelphia, Nov. 3.

Museums of Art: *see* ART GALLERIES AND ART MUSEUMS.

Music. There is little doubt that the nineteen-forties were witnessing a renaissance of music in the western hemisphere. The growing interest and faith in American music, along with the eagerness of large orchestras, of opera companies and of smaller ensembles, also, to perform native music, has encouraged a musical production which, at least in quantity, surpasses that of any other single period in U.S. history. It is impossible to enumerate anything like the entire list of young composers coming into prominence or of the premières of their very creditable works. In the U.S. New York is no longer the only outstanding music centre—Los Angeles, Calif., is becoming more and more prominent, especially through the performances of the New Los Angeles Symphony under Werner Janssen, and the WPA orchestra under James Sample. Hollywood, Calif., Chicago, Ill., Indianapolis, Ind., and Washington, D.C., especially since the defense boom, are more and more in the news. The south, too, announces concerts, festivals, contests, first performances.

The 50th anniversary of the Chicago Symphony orchestra led to the writing of many important works commissioned for the occasion, notably, Stravinsky's *Symphony in C Major*, which was looked upon as the culmination of his orchestral writing. There was also a new *Symphony Number 3* by Leo Sowerby, and works by Casella, Rudolph Ganz and others. The year 1941

marks also the 100th anniversary of the oldest orchestra in the United States, the New York Philharmonic, which began its centennial season in October. There was a marked revival of interest in opera as evidenced by the organization of new opera companies, notably the New Opera company in New York, N.Y., which, like several others, aimed to give opera in English, at moderate prices, and to use American artists and performers. Further stimulus came from the commission of works by the League of Composers, the Juilliard School and the radio. Among works commissioned by the league in co-operation with the CBS were *The Lamp on the Plains* by Ernst Bacon, *The New York Opera* by Marc Blitzstein, *Solomon and Balkis* by Randall Thompson. Among the best radio scores was Virgil Thomson's for *The Trojan Women* of Euripides. Several other new works were well received, especially a new "socialist-labouristic" opera by Marc Blitzstein, *No For An Answer,* and a choral-operetta by the British composer, Benjamin Britten, *Paul Bunyan,* with text by the poet, W. H. Auden. The International Society of Modern Composers met in New York for the first time, and was distinguished from other meetings, also, in its use of radio for broadcasting of programs, but few works on the programs were acclaimed. In New York, N.Y., also, in addition to the many performances of works of Shostakovich, Hindemith, Schoenberg, Milhaud, etc., there was the world première of Bartok's *Quartet No. 6,* by the Kolisch quartet, and of his *Music for Strings, Percussion and Celesta* at the New School for Social Research. Notable among the works of native composers were William Schuman's *Third Symphony* and his choral work *This Is Our Times,* David Diamond's *First Symphony* and Samuel Barber's *Violin Concerto.* The League of Composers presented works of a young group: John Lessard, Ben Gossicke, Emil Koehler, Donald Fuller, Norman della Joio, Lukas Foss and Edward Cone. In Philadelphia, Pa. was given the première of Rachmaninoff's *Symphonic Dances* and of Bernard Wagenaar's *Symphony No. 3.* In Washington, D.C., the National Symphony orchestra presented a prize-winning work, the *First Symphony* of Arnold Cornelissen. In Cincinnati, O., there were presented a *First Symphony* by John Haussermann and Weinberger's *The Lincoln Symphony.*

In Rochester, N.Y. the Festival of American Music and the Symposium of American Music, both under the direction of Howard Hanson, presented many new works, notably a *First Symphony* by Robert Ward, a *Choral Variations and Fugue* by Carl McKinley, and *Overture for a Drama* by Ross Lee Finney. In Indianapolis, Ind., where the orchestra boasted 11 premières of American works, were given Carl Eppert's *Escapade,* Henry Cowell's *Purdue,* works by Harl McDonald, Carpenter, McCollins, etc. In Minneapolis, Minn. were presented under the leadership of Dimitri Mitropoulos, a new *Symphony* by Paul Hindemith especially commissioned for the Minneapolis Symphony orchestra, *The Life of Man* by John Verrall, and *Slow Piece* by Ross Lee Finney. Hollywood, Calif., through the WPA orchestra, and through the stimulus of the motion pictures presented many novel works and in San Francisco, Calif., the WPA Composer's Forum laboratory, organized by Ashley Pettis, who contributed so greatly to the achievement of the WPA in New York city, encouraged younger composers. In Los Angeles, Calif. appeared the names of Homer Simmons, Marion Ralson, and others. *Civic Center Suite* by Leigh Garline, which used adding machines and to which was added the wail of taxpayers, aroused interest, but Stravinsky's reharmonization of the "Star-Spangled Banner" brought little response.

Canada.—There were two main centres of Canadian creative activity. In Toronto, Ont., there were such able composers as Godfrey Redout, Louis Applebaum and John J. Weinzwerg, leaders of the radical movement in Canada. In Montreal, Que., in addition to Hector Gratton and the prodigy, André Mathien, there were the French-Canadian Maurice Blackhorn and Alexander Brott; also Barbara Pentland, from Winnipeg, Man. and Robert Fleming from Saskatoon, Sask.

Mexico and South America.—A subsidy provided by the Mexican government encouraged a musical activity in Mexico to which large numbers of visitors from the U.S. contributed. Both Cuba and Puerto Rico had a prosperous opera season, under the direction of D'Andria.

The year in South America was marked both by an interchange of artists between North and South America, and by the distinguished work of native South American composers. Burle Marx (Brazilian) played his own composition with the Detroit Symphony. Juan José Castro made his debut with the National Broadcasting company. The U.S. government promoted numerous good-will tours: Aaron Copland directed his own compositions in various South American cities. A wood-wind organization made up of North American composers, Robert McBride, Alvin Etler, Adolph Weiss, David van Vactor and John Barrows performed their works throughout South America and the Yale Glee club toured the continent. Buenos Aires, Arg., had the most imposing musical season. It was the 23rd year for the Teatro Colón, which produced at least two new native works: a one-act opera, *Lin Calel* by Armando D'Esposito and a ballet, *La Infanta,* by Alfredo Schuema. The Association of Argentine Composers presented works by Gilardo Gilardi, Eduardo Caba, Alberto Williams, among many. Celia Torra's Women's Orchestra and Choral society were prominent. There were many concerts in Bogotá, Colom.; in Montevideo, Urug.; in Santiago, Chile—which in 1941 celebrated the fourth century of its founding. There were three creative groups in Chile, the first, under Italian influence, was led by Enrique Soro and Melo Cruz, whose new opera, *Maurico,* was performed. The second, more national, was led by Humberto Allende. The third, known as the eclectic group, and headed by Domingo Santa Cruz, included Alfonso Leng. Lima, Peru, had also its own orchestral ensemble, directed by a German refugee and boasted its own native composers: André Sas, one of whose works was performed at the I.S.C.M. in New York, N.Y.; Theodoro Valcárcel, known for his ballet, *Suray-Surita;* Raoul de Verneuil. In Rio de Janeiro, Braz., *Malazarte,* a new opera by Oscar Lorenzo Fernandez was very successfully performed.

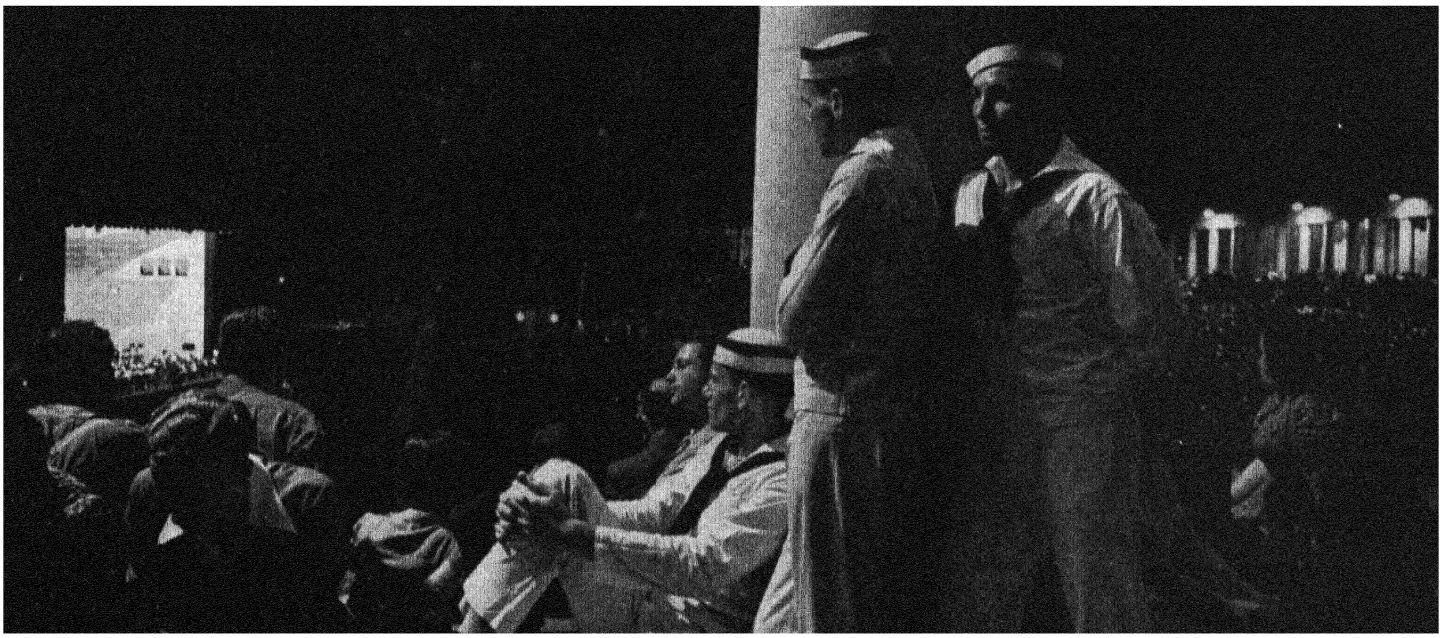
Europe.—In Europe the greatest musical activity appeared to be in England and in Portugal, where the influx of refugees stimulated both performance and composition. The San Carlos opera was restored and opened on Dec. 1, 1940, with a new opera by Ruy Coelho. Prominent artists were Arturo Santos, Gorge Kroner de Vasconcellos and Fernano Lopes Graca, an adherent of Schoenberg. English musicians performed some American works and in the fall showed an understandable interest in Russian music. Numerous premières were announced: a very serious and well received new symphony by Edmund Rubbra; Benjamin Britten's *Violin Concerto;* and works by Alan Rawsthorne, Alan Bush, Elizabeth Maconchy, etc. After the destruction of Queen's hall in London by bombing, the Promenade concerts were moved to Albert hall. The Sadler's Wells Opera company continued. Myra Hess (made a Dame of the British empire) gave daily concerts in the National museum. Concerts at rest centres—for people who were bombed out of their homes—at factories, and at air-raid shelters contributed a distinctive contemporary touch. Outside of London, Oxford was the primary music centre and had a performance by the Oxford Bach choir of Vaughan Williams' new work, *Serenade to Music* and a successful new opera by Vere Somerset, *The Imbroglio.* Orchestras and opera companies and artists, too, toured the provinces and small groups

Above: A MUSICAL GENIUS at 11, Lorin Maazel conducted the NBC summer symphony in 1941. The picture shows him rehearsing an outdoor concert by the Steindel Symphony orchestra in Grant park, Chicago

Below: MEMBERS OF SERGE KOUSSEVITZKY'S STUDENT ORCHESTRA rehearsing at the Berkshire Symphonic festival in the summer of 1941

Bottom: SAILORS AND SOLDIERS in uniform were admitted free to the open-air concerts at Lewisohn stadium, New York city, during the summer of 1941

Above: MASTER AND YOUNG STUDENT of the harp at the National Music camp at Interlochen, Michigan, where some 350 children received training in 1941



throughout Britain organized choruses and women's choirs.

Musical life in Switzerland apparently continued normally, but with few innovations. The season for 1941–42, however, promised to be more interesting with premières announced of Kodaly's *Variations for Orchestra,* Casella's *Symphony,* Opus 63, a new *Symphony* for string orchestra by Honegger, a *Concerto for Violin* by Bohuslav Martinu, and a new oratorio by Willy Buckhard, *Das Jahr.* Radio Genève was preparing a première of *Naïades* by Pierre Girard and a young Genevese composer, Pierre Wissmer. In Italy Malipiero's opera, *Ecuba* was received with mild enthusiasm. The Germans in Paris apparently encouraged musical performances for the entertainment of troops of occupation, but the purge of Jewish performers and the scattering or execution of other French talent kept the concerts of low standard. Alfred Cortot was a member of the national council in Vichy, and was looked upon as the guardian of French culture. Georges Auric was in Paris. Wanda Landowska, the harpsichordist, abandoned her collections and instruments and moved to America. In Germany and in German-occupied Vienna, musical fare varied with Germany's military alliances and relationships.

Wagner was, of course, staple and Anton Bruckner was popular. The Italians were frequently played and many French works were permitted. There were performances of Kodaly and of Bartok. Enesco conducted in Vienna where Richard Strauss's operas were frequently heard. Eugen Suchon, a young Slovakian, was considered promising material. Berlin took the lead over Vienna in the field of opera, under Berlin Director Heinz Tietjen, and new works sponsored by the nazis appeared—*Die Zaubergeige* and *Peer Gynt* by Werner Egk; *Die Bürger von Calais* and *Johanna Balk* by Rudolph Wagner-Regeny.

Opera enlivened the Stockholm season, but there was only one première: Kurt Atterberg's entertaining *Aladdin.* The news from Russia indicated Shostakovich working on Leningrad defenses in the morning and composing a new symphony in the afternoon.

(R. L. Fy.)

Popular Music.—During the year 1941 popular music in America reached its lowest ebb. Radio's boycott of the American Society of Composers, Authors and Publishers (ASCAP) went into effect on January 1, and from then on all activity in this field was political rather than musical. (*See* Performing Right Societies; Radio: *Musical Property.*)

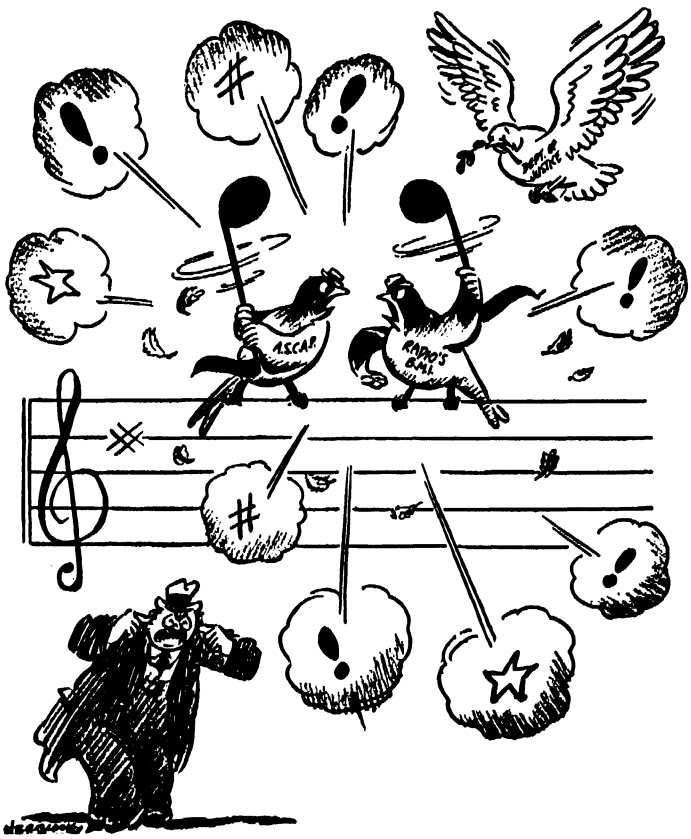
Judged by sales of sheet music, the song of the year was a revival, "Intermezzo," which had attracted little attention in the film of the same name, but later took full advantage of the lack of competition. Its melody, right out of Wagner's *Tristan und Isolde,* ran away from all the current makeshifts, and it was the only song to reach a total of half a million copies.

Its nearest rival in popularity was the fox-trot version of Tschaikovsky's *Piano Concerto* known as "To-night We Love." (More than a dozen transcriptions of this famous opening melody were in circulation, with "Concerto for Two" nearest to the success of the winner.)

Tschaikovsky appeared again in the "first 15" with "The Things I Love," based on the Russian composer's "Melody."

According to *Variety's* dependable report, the others in the select class were, in alphabetical order, "Amapola" (a revival), "Daddy, Do You Care?", "Frenesi" (an importation), the "Hutsut Song" (the nonsense ditty of the year), "I Don't Want to Set the World on Fire," "I Hear a Rhapsody," "Maria Elena," "My Sister and I," the "Shepherd's Serenade," "You and I" and "You Are My Sunshine." In the last few weeks of the year "The White Cliffs of Dover" suddenly developed into a huge hit and promised shortly to outstrip all the other songs of 1941.

An epidemic of war songs broke out with the declaration of more serious hostilities, but "God Bless America" held its own in the patriotic field. Musical comedy showed a solid success in the Rodgers-Hart *Pal Joey,* with Cole Porter's *Let's Face It* encroaching upon his *Panama Hattie,* while Kurt Weil and Ira Gershwin combined their talents effectively in *Lady in the Dark.* These were highlights in a singularly depressing year, in which "popular" music became definitely unpopular. (S. Sp.)



"OUR AMERICAN SONGBIRDS." Herblock of NEA Service pictures the lengthy dispute between the two licensers of U.S. radio music which began Jan. 1, 1941, with the withdrawal of all ASCAP music from most of the nation's broadcasting stations

Mussolini, Benito (1883–), Italian statesman and dictator. For his earlier career, see *Encyclopædia Britannica.* Il Duce chose June 10, 1940, as the propitious date for entering the war, doing so with the declaration that "our conscience is entirely clear." After a few desultory thrusts at defeated France he consulted with Hitler at Munich June 18 on the terms of peace. Italian military activities then remained in relative abeyance until the beginning of the campaigns in North Africa (Sept. 12, 1940) and in Greece (Oct. 28). Both these operations were soon thrown into reverse, and on Dec. 6, 1940, Mussolini reorganized his military command.

The events of Mussolini's career in 1941 fell into the same general pattern first set in 1940: conferences with Hitler; shakeups of the army; explanations of defeats; and threats against the common enemies of the axis. Early in the year he dismissed Gen. Ubaldo Soddu as commander of the Albanian forces; in February he admitted his defeats in Libya and Greece but told his people they could count upon German assistance; the next month he retired Rodolfo Graziani as chief of the Italian general staff. Meanwhile he had met again with Hitler (January) and with Franco (Feb. 12). On June 2 he conferred with Hitler at Brenner pass. Eight days later, with the Greeks safely out of the way, he made this declaration: "It is absolutely mathematical that in April, even if nothing had happened to change the Balkan situation, the Italian army would have overcome and annihilated the Greek army." In this same address he assured his listeners

that U.S. intervention would not alter the outcome of the war. After Italy had entered the war against the U.S.S.R., Mussolini paid a visit to the Russian front where, in late August, he held another five-day conference with Hitler. On Dec. 2 the Italian press revealed that 60 persons charged with plotting to assassinate Mussolini were under detention in Trieste. (*See* also ITALY.)

Mussolini, Bruno (1918–1941), son of Italian Premier Benito Mussolini, literally grew up with the Italian fascist movement. Trained to fight in his country's service, he became a licensed pilot at 17. A year later he flew with Italian squadrons raiding Ethiopia, and he was a squadron pilot when Il Duce's air force helped General Franco bomb loyalist cities in the Spanish civil war, 1936–39. During the lull between the end of the latter conflict and the beginning of World War II, young Mussolini helped organize the Italian air line to South America. The start of the second world conflict saw the Italian premier's son in the role of commander of a bombing squadron. He saw service in the Mediterranean and on the Greek front, and he engaged in raids over Malta. He was killed when a bomber that he had taken up on a test flight crashed as it was preparing to land at San Giusto airfield, near Pisa, Aug. 7.

Nagayo, Matao (1878–1941), Japanese bacteriologist and cancer expert, was born in April in Tokyo. He was graduated from the Tokyo Imperial university, of which he later became president (1935–38). Nagayo was director of the Tokyo Epidemic Research laboratory (1919–34), and dean of the medical faculty of the Tokyo Imperial university in 1933. The day before his death in Tokyo on Aug. 16, Nagayo was created baron by a court decree signed by the emperor.

Narcotics: *see* DRUGS AND DRUG TRAFFIC.

Natalie (1859–1941), queen of Serbia, widow of the Serbian king Milan Obrenovitch IV, was born May 2 in Florence, Italy, the daughter of Col. Ketchko, a Moldavian soldier in the Russian army. At the age of 16 she was married to Prince Milan, heir to the Serbian throne, and a son, Prince Alexander, was born to them a year later. Prince Milan, who had been placed on the Serbian throne under a regency in 1868, became king in 1882. But Milan incurred the enmity of his people with his pro-Austrian sympathies, his taxation policy and his unsavoury private life. No longer able to tolerate her husband's extravagance and scandalous conduct, Natalie left the court with her son in 1886 and found refuge in Wiesbaden. Two years later Milan recovered the custody of his son, circulated infamous rumours about his wife and secured a divorce. In 1889 Milan abdicated in favour of his son, Prince Alexander, and retired to Paris. Five years later a nominal reconciliation was effected between the royal couple, and Natalie returned to Serbia in 1895. After the assassination in 1903 of her son Alexander and his wife, Queen Draga, Natalie fled to France and lived for many years in Biarritz. She later entered the convent of Our Lady of Zion in Paris. Her death was reported from Paris on May 8.

National Academy of Sciences. The National Academy of Sciences was incorporated by act of congress in 1863 for the purpose of investigating, examining, experimenting and reporting upon any subject of science or art whenever called upon by any department of the United States government. Membership is by election, in recognition of outstanding achievements in scientific research, and is limited to 350 active members and 50 foreign associates. Members must be citizens of the United States.

At the annual meeting held in Washington, D.C., April 28, 29 and 30, 1941, 15 new members were elected as follows: Werner Emmanuel Bachmann, René Jules Dubos, Evarts Ambrose Graham, Arthur Scott King, Charles Christian Lauritsen, Alfred Lee Loomis, J. Robert Oppenheimer, John Thomas Patterson, Karl Sax, George Gaylord Simpson, Joseph Slepian, Lyndon Frederick Small, Wendell Meredith Stanley, Tracy Yerkes Thomas, George Bernays Wislocki. Three foreign associates were elected: Edgar Douglas Adrian, Archibald Vivian Hill and Sir Arthur Keith. At the dinner of the academy on April 29, 1941, the Henry Draper medal was presented to Dr. Robert Williams Wood, of Johns Hopkins university.

National Science Fund.—At the annual meeting in 1941, the academy established, under its charter, the organization for the National Science fund for the promotion of human welfare through the advancement of science. The National Science fund was to receive from individuals or others, donations, bequests, grants or other gifts of money to be expended in such manner as in the judgment of the board of directors of the fund would best promote human welfare through the advancement of science. The board of directors consists of the president and treasurer of the academy, the chairman of the National Research council and the president of the American Association for the Advancement of Science, during and by virtue of their office, together with additional members (both members and nonmembers of the academy) appointed by the council of the National Academy of Sciences. The fund was to be operated exclusively for scientific, literary, or educational purposes and no part of the net earnings of the fund was to inure to the benefit of any private individual, and no part of the activities was to consist in carrying on propaganda or otherwise attempting to influence legislation. The board of directors of the National Science fund have an office at 515 Madison Ave., New York city. The autumn meeting was held at the University of Wisconsin, Madison, Wis., on Oct. 13–15, 1941.

The academy publishes an annual report, biographical memoirs of its deceased members, occasional scientific memoirs and monthly *Proceedings*.

The officers of the academy in 1941 were: Frank B. Jewett, president; Isaiah Bowman, vice-president; L. J. Henderson, foreign secretary; F. E. Wright, home secretary; J. C. Hunsaker, treasurer and Paul Brockett, executive secretary. The academy building is at 2101 Constitution avenue, Washington, D.C.

(P. BT.)

National Archives: *see* ARCHIVES, NATIONAL.

National Catholic Rural Life Conference: *see* CATHOLIC RURAL LIFE CONFERENCE, NATIONAL.

National Catholic Welfare Conference: *see* CATHOLIC WELFARE CONFERENCE, NATIONAL.

National Debts. The national debt of a country generally refers to the total financial obligations of the state arising out of the issuance of public securities. It differs from public debt in that it includes only the obligations of the central government, whereas the public debt also covers obligations of local government units. The national debt usually indicates the extent to which the central government has resorted to borrowing over the years to make up the deficit between its expenditures for all government services and investments and its revenues from taxation and various minor sources. As the manner of keeping official accounts varies considerably from country to country, however, there are many exceptions to this definition. In the United States, for example, several agencies of government have been set up outside the budget, the Reconstruction Finance corporation (*q.v.*), the Home Owners' Loan cor-

poration (*q.v.*), the Federal Farm Mortgage corporation, etc., and their obligations are not included in the official figure of the national debt. On the other hand, obligations assumed by the state but not originating from a borrowing operation—such as war pensions or indemnities—have in many cases been included in official national debt statistics. The adjusted service bonds issued to veterans are an example of this type of obligation included in the United States national debt total.

Table I.—*Gross Debt of the United States, 1913–43*

June 30	(Millions of dollars)	June 30	(Millions of dollars)
1913	$ 1,193	1929	$ 16,931
1914	1,188	1930	16,185
1915	1,191	1931	16,801
1916	1,225	1932	19,487
1917	2,976	1933	22,539
1918	12,244	1934	27,053
1919	25,482	1935	28,701
1920	24,298	1936	33,545
1921	23,976	1937	36,427
1922	22,964	1938	37,167
1923	22,350	1939	40,445
1924	21,251	1940	42,971
1925	20,516	1941	48,961
1926	19,643	1942E	70,612
1927	18,510	1943E	110,421
1928	17,604		

Source: Data from 1913 to 1941 are from U.S. treasury department, daily treasury statement (revised); 1942 and 1943 are estimates reported in budget of the United States government for the fiscal year ending June 30, 1943 as presented to the congress by President Roosevelt.

While revenues in all countries have equalled or exceeded expenditures during many years in the past, the world-wide trend of national debts has been upward since borrowing became a recognized method of financing government expenditures. By far the most important factor in this upward trend has been the tremendous state expenditures required by modern warfare. Expenditures for the development of natural resources, usually by loans placed abroad, also have been a factor in some of the more recently settled territories. And during the decade 1932–41 public spending to relieve unemployment assumed major importance in increasing the national debts of some countries.

The history of the U.S. debt entered a new phase with the inauguration of the national defense program in the middle of 1940. Expenditures on the rearmament effort were soon rising so rapidly that not even the opponents of the administration suggested that the budget be balanced. New tax measures, calculated to increase revenues substantially, were passed by congress in both 1940 and 1941, but heavy borrowing was nonetheless necessary. By the end of 1940 the national debt reached $45,024,631,000, thus just exceeding the old statutory limit of $45,000,000,000, and by the end of 1941 the debt figure stood at $57,938,000,000.

The outbreak of actual war on Dec. 7, 1941, required that the rearmament program be transformed into a full war effort. For this effort to obtain an overwhelming superiority of war matériel to assure defeat of the axis forces, President Roosevelt recommended to congress in his budget message on Jan. 7, 1942, a total war expenditure for the ensuing fiscal year of almost $53,000,000,000, which he contemplated would take more than half of the national income. His recommendation included the largest tax program in United States history, a total of $27,000,000,000 of revenues, $9,000,000,000 of which were to be derived from new levies. Despite the contemplated increase in federal revenues, the president indicated what the full impact of the war would mean to the national debt by presenting estimates of the national debt at the close of the fiscal year 1942 of $70,612,000,000 and a debt total at the end of fiscal 1943 of $110,421,000,000.

It is interesting to note that during the first year and a half of the rearmament program, the president held to the fiscal ideas upon which his administration was based. In the budget message of 1941, he stated that such drastic taxation as would be required to finance the defense program on a pay-as-you-go basis would interfere with the full use of the productive resources. A year later he observed that, although some rise in prices had accompanied this policy, part of the price rise was desirable in that it facilitated the increase in the production required for an all-out war program. By that time, however, the president felt that extraordinary measures were needed to "aid in avoiding inflationary price rises which may occur when full capacity is approached." The president continued by explaining his reason for the increase in the national debt, despite his desire to avoid inflation:

"With expenditures and deficits multiplied, the threat of inflation will apparently be much greater. There is, however, a significant difference between conditions as they were in the fiscal year 1941 and those prevailing under a full war program. Last year defense expenditures so stimulated private capital outlays that intensified use of private funds and private credit added to the inflationary pressure created by public spending.

"Under a full war program, however, most of the increase in expenditures will replace private capital outlays rather than add to them. Allocations and priorities, necessitated by shortages of material, are now in operation; they curtail private outlays for consumers' durable goods, private and public construction, expansion and even replacements in nondefense plant and equipment. These drastic curtailments of nondefense expenditures add, therefore, to the private funds available for noninflationary financing of the government deficit.

"This factor will contribute substantially to financing the tremendous war effort without disruptive price rises and without necessitating a departure from our low-interest-rate policy."

The implication of this analysis is that the size of the national debt in itself cannot produce inflation, but that inflation results from a total flow of expenditures, public plus private, in excess of current production at current prices. In accordance with this analysis, it was being stressed that the sale of defense bonds to the general public should be aimed at reducing total spending.

As to the burden of this debt, it was estimated by the president that the annual interest charges would rise to about $2,500,000,000 at the end of the fiscal year 1943 from the 1940 level of $1,000,000,000. He stated further that paying $2,500,000,000 out of an extremely low national income would impose an excessive burden on taxpayers, while the same payment out of a $100,000,000,000 national income could be carried without undue hardship. The capacity of the nation to support the large debt total which

Table II.—*National Debt of Various Countries*

Country	Date of Latest Comparable Debt Figures	Total Debt in Local Currency* (000,000)
Africa		
Egypt	4/30/39	95.0 pounds
Union of South Africa	9/30/41	362.0 pounds
America, North		
Canada	3/31/41	4,744.0 dollars
Mexico	12/31/36	1,326.0 pesos
United States	12/31/41	57,938.0 dollars
America, South		
Argentina	12/31/38	4,398.6 pesos
Brazil	12/31/37	16,841.2 milreis
Chile	12/31/39	3,980.1 pesos
Colombia	12/31/38	206.6 pesos
Peru	6/30/39	807.5 soles
Asia		
India	3/31/40	11,956.7 rupees
Japan	3/31/41	30,895.0 yen
Europe		
Belgium	6/30/41	78,659.0 francs
Bulgaria	8/31/41	28,311.0 leva
Czechoslovakia	12/31/38	52,950.0 koruny
Denmark	3/31/39	1,237.7 kroner
Finland	12/31/38	3,554.0 markkas
France	8/31/39	352,210.0 francs
Germany	7/31/41	105,874.0 reichsmarks
Greece	1/31/40	52,874.7 drachmas
Hungary	6/30/38	1,597.7 pengos
Italy	6/30/35	108,636.6 lire
Netherlands	6/30/39	3,911.9 guilders
Norway	6/30/39	1,528.4 kroner
Poland	9/30/38	4,973.2 zlotys
Portugal	12/31/38	7,192.1 escudos
Rumania	3/31/38	117,874.3 lei
Spain	12/31/35	21,779.0 pesetas
Sweden	9/30/41	5,845.0 kroner
Switzerland	12/31/39	2,725.1 francs
Turkey	5/31/39	619.4 pounds
United Kingdom	8/31/41	12,608.0 pounds
Yugoslavia	3/31/39	24,620.0 dinars
Oceania		
Australia	6/30/41	1,426.0 pounds
New Zealand	3/31/41	349.4 pounds

Sources: Statistical yearbook and monthly statistical bulletins of the League of Nations; Federal Reserve bulletin; official government reports.

*For approximate value of various currencies *see* EXCHANGE CONTROL AND EXCHANGE RATES.

was in store was, therefore, conceived to depend upon the ability to maintain the level of employment and national income existing when the war ended.

Since 1941 was a year of war on three continents and of heavy armament expenditure throughout the world, national debts of all major countries were increased by substantial amounts. Reliable figures for many countries, however, were not available. For, in addition to the usual difficulty that reports are only made at the end of the fiscal year, the totalitarian powers suppressed, either entirely or in part, information on their fiscal operations.

Furthermore, little was known about government financial conditions in the conquered nations of Europe.

The national debt figures which were issued for a few major countries indicated, however, what occurred because of war conditions. The debt of Great Britain rose from £8,475,000,000 on Sept. 30, 1939 to £12,608,000,000 in Aug. 1941.

In Canada the national debt rose from $3,642,049,000 on March 31, 1939 to $4,744,057,000 two years later. An increase in the publicly revealed debt of Germany from r.m. 39,748,900,000 on Sept. 30, 1939 to r.m. 105,874,000,000 in July 1941 was made known, but these figures were of limited meaning (except insofar as they suggested the extent of the German war effort), because they did not represent the total government debt at either date.

In Table II are presented the national debts of various countries for the end of the latest fiscal year available. It should be kept in mind that these debt figures are not comparable with each other because of differences in the division of responsibility between the national and local government units from country to country, because of differences in size, wealth and population and because of differences in services rendered or investments made by government. Moreover, in these days of controlled exchange and trade, the conversion of local currencies into a common unit, such as the dollar, is exceedingly difficult. (*See* also BUDGETS, NATIONAL; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; NATIONAL INCOME.) (M. Gt.)

National Defense: *see* DEFENSE, NATIONAL (U.S.); *see* also under individual countries.

National Defense Mediation Board: *see* DEFENSE MEDIATION BOARD, NATIONAL.

National Defense Research Committee: *see* SCIENTIFIC RESEARCH AND DEVELOPMENT, OFFICE OF.

National Education Association of the United States was organized in Philadelphia in 1857. It has a membership of 211,191 and its affiliated state associations have a membership of 802,481. Much of the work of the association is carried on by its 60 departments, councils, commissions and committees. The membership of the larger departments in 1941 was: school administrators 4,439; elementary principals 6,267; secondary principals 7,409; music 9,309; health, physical education and recreation 10,231.

The association's winter convention was held at Atlantic City, Feb. 23–28, 1941; its general convention in Boston, June 29–July 3, 1941. The 1942 conventions were to be in San Francisco, Calif., in February and Denver, Colo., in July.

Among notable activities of the association during 1941 were: (1) Conferences held throughout the United States by the Educational Policies commission and the publication of its book *Education of Free Men in American Democracy*. (2) The appointment and staffing of a new commission on the Defense of Democracy through Education. (3) The widened observance of American Education week, Nov. 9–15, 1941, around the theme "Education for a Strong America." (4) The work of the Committee on New Voter Preparation and Recognition in developing Citizenship Recognition day, now observed each year the third Sunday in May, and the publication of the *American Citizens Handbook*. (5) The continued growth of Future Teachers of America and the publication of the *First FTA Yearbook*. Association headquarters are at 1201 16th St., N.W., Washington, D.C. The official organ is the *Journal of the NEA*, edited by Joy Elmer Morgan, and issued to all members monthly except during June, July and August. The president for 1941–42, Myrtle Hooper Dahl, teacher, Hiawatha school, Minneapolis, Minn.; executive secretary, Willard E. Givens. (*See* also EDUCATION.)

(J. E. Mo.)

National Gallery of Art: *see* SMITHSONIAN INSTITUTION.

National Geographic Society. Organized in 1888 by a small group of professional geographers resident in Washington, D.C., this society has carried out its purpose as set forth in its charter of "increasing and diffusing geographic knowledge" by over a half-century of noteworthy original contributions in geography and its related sciences. In 1899, Gilbert Grosvenor, now president, assumed the direction of the organization's activities and broadened the scope of its researches in such a way as to appeal to the layman interested in scientific accomplishments. The success of this plan is evidenced in the growth of the membership of the society from less than 1,000 in 1899 to 1,175,000 in 1941.

Results of its participation in more than 100 expeditions have included the achievement of the world's altitude record in a manned balloon when Capt. Albert W. Stevens and Capt. Orvil A. Anderson ascended to 72,395 ft. in the "Explorer II" on Nov. 11, 1935, under the joint sponsorship of the society and the U.S. army air corps. In co-operation with Dr. William Beebe in explorations off the coast of Bermuda in Aug. 1934, the society established the world record for a deep-sea dive by man, 3,028 ft.

Deeply interested in America's past, the society has met with noteworthy successes in the field of archaeology. In 1941 the society joined for the third season with the Smithsonian Institution in excavations in Veracruz, Mex. The 1939 expedition found a stone stele engraved in Maya characters, with a date interpreted as 291 B.C. by the Spinden correlation, 31 B.C. by the Thompson correlation. By either correlation, this is the oldest dated work of man so far found in America. In 1940 the party uncovered five great carved stone heads. The 1941 expedition excavated the largest and finest cache of jade yet discovered in America. Matthew W. Stirling, as leader, and Mrs. Marion I. Stirling, as field secretary, were awarded Burr prizes of $500 each for their service in the Mexican expeditions.

A grant made in 1941 enabled Mr. and Mrs. William Albee to study and photograph in colour animal life in the Sierra Nevada of California. Investigations were also made during the year by staff members of the society who visited Australia, the Union of South Africa and India.

During 1941 Dr. Walter T. Swingle reported that he had named a new species of *Momordica* in honour of Dr. Gilbert Grosvenor, *Momordica Grosvenori*. The specimens of the plant were collected in 1937 by a society expedition to the region of Kwei-lin, China, led by Dr. G. Weidman Groff, who was searching for the source of the Chinese "lo han kuo," a widely used household medicine in southern China.

Results of the society's studies are published in the *National Geographic Magazine*. Special features of the magazine during the year 1941 included the reproduction in colour of eight paintings of the "Ships that Guard Our Ocean Ramparts," by Arthur Beaumont. Articles were published on everyday life in the army and navy of the United States.

In addition to its magazine, the society publishes a series of *Contributed Technical Papers*. The 1941 monograph in this series was "National Geographic Society-National Bureau of Standards Solar Eclipse Expedition to Patos, Brazil," a report on the total eclipse observed at Patos on Oct. 1, 1940.

World recognition has been awarded the large-scale, ten-colour maps prepared by the society's cartographic department. Maps published in 1941 included "Indian ocean, Australia, New Zealand and Malaysia," "Northwestern United States and Neighboring Canadian Provinces," "The Atlantic ocean," and "The World." (G. Gr.)

National Guard. The induction of the national guard, begun during 1940, was continued during the first half of 1941 until, when the final unit was inducted on Oct. 6, 1941, the national guard of the several states had contributed to the armed defense of the nation 18 combat divisions and other formed units totalling: 20,455 officers, 221 warrant officers and 279,358 enlisted men. The divisions reported for duty at strengths averaging approximately 10,000 men, received increments of conscripts almost as large as themselves and found their first duty was to train these recruits and weld them into the combat force, drawing upon their own experienced skill and practical leadership developed during the two decades beginning in 1920.

Compiled figures show that 5,964 officers and 2,130 enlisted men of the national guard had during this 20-year period graduated from special or general service schools of the army. Sixty-three per cent of the officer graduates were in service in 1941. When it is remembered that the national guard of the 1920s was largely officered by World War I veterans and that increasing age alone removed many of these from the rolls, the number remaining is considered large. The officer corps of the national guard upon induction was consequently a judicious mixture of seasoned veterans and enthusiastic youths of modernized military education.

When congress, on Aug. 18, 1941, authorized extension of active service beyond the "12 consecutive months" originally provided in 1940, enlisted guardsmen and drafted men in these units were held over, except certain categories of advanced age or personal dependency; officers remained at their duties, except those whom rigorous field service standards eliminated. Between midsummer and the end of the year, all national guard units participated in a series of successive field manoeuvres with and against regular army troops and proved their mettle. As the year closed, problems were being considered for the release of personnel individually, to make way for the training of new men and to build up in each of the separate states a mass of qualified and classified personnel as a reserve for field forces, but the declaration of war in December caused such releases to be stopped and men released to be subject to recall to their units.

Under an act of congress approved Oct. 21, 1940, moves began to replace these units in their home communities by state guard units to provide local defense in frontier areas and to protect communities against domestic disturbances beyond the power of police to control. By the end of the year such forces, armed by the federal government, uniformed by the states, and enrolled as volunteers without pay, had reached a strength of 105,812 officers and men. (J. F. Ws.)

National Income. With the basic stimulus provided by the huge rearmament program, the national income of the United States in 1941 made the largest single year increase in the nation's history and rose to a new high record. As compared with the 1940 total of $77,200,000,000, the preliminary estimate of the national income for 1941 was $94,500,000,000, a rise of over one-fifth. The magnitude of the 1941 figure for this most comprehensive measure of the country's economic activity may be better realized when set against the World War I boom peak of $69,800,000,000, or the former high record of $83,365,000,000 reached in 1929.

Meaning of National Income.—Proper use and interpretation of national income statistics require an understanding of the concept upon which their compilation is based. The national income measures the net value of the economic goods and services currently produced by the private and public enterprises of the nation. Almost every word in this definition has a special meaning for the purpose of national income compilation and conditions the character of the estimates. National income represents the "net" value of output, for example, in that only the output of final products is included. This means that raw materials and services used up in the production process and business charges for depreciation and depletion are excluded. Taxes paid by business to all government units, whether passed on to the consumer in the form of higher prices or not, are also excluded. The estimates, moreover, are limited to "economic goods and services"; thus, those goods produced outside the market place, such as the services of housewives, are not included. Furthermore, only "currently produced" goods are included in the concept. In consequence, such income receipts as relief, unemployment benefits, pensions, gifts, capital gains or losses and gains from illegal activities are excluded. Finally, the activities of both "private" and "public" enterprises are included, that is, productive activities of government agencies as well as business units. It is well to realize that the national income is not simply the sum of the money income of all persons in the nation, such as might be reported for income tax purposes. In the first place, it includes the income of corporations, apart from capital gains and losses, that is not distributed to individuals. In the second place, it includes only such receipts of individuals as are derived from currently rendered services, with receipts of both money and commodities being taken into account.

Changes in National Income Since 1919.—Estimates of national income from 1919 to 1941 are shown in Table I. The changes in this series over the years reflect primarily the fluctuations in the value of economic activity that occurred. It will be noted that the economic boom associated with World War I reached its high point in 1920. There followed a sharp and short liquidation in 1921 and then an almost continuous upsurge of economic activity during the prosperous '20s, with a new high for

Table I.—*National Income in Current and Average 1935–39 Dollars*

Year	Current dollars	1935–39 dollars*	
	Total (In 000,000,000s of dollars)	Total (In 000,000,000s of dollars)	Per capita ($)
1919	$67.7	$47.9	456
1920	69.8	44.1	414
1921	52.8	40.8	377
1922	60.6	49.7	452
1923	70.0	56.6	508
1924	70.1	56.5	499
1925	74.8	59.4	517
1926	76.9	60.7	521
1927	76.4	62.0	525
1928	80.2	65.1	543
1929	83.4	68.1	560
1930	69.0	58.1	472
1931	54.3	50.8	410
1932	40.0	41.7	334
1933	42.5	45.9	365
1934	50.3	51.5	407
1935	55.8	56.2	442
1936	65.1	65.4	511
1937	71.5	69.0	535
1938	64.1	64.4	496
1939	70.8	71.7	548
1940	77.2	77.8	589
1941†	94.5	89.1	671

Source: U.S. department of commerce.
*Adjusted for price changes by use of a combination of cost of living indexes of urban workers and farmers and price index of capital goods.
†Preliminary.

national income in 1929 that was not to be surpassed until 1941. The magnitude of the disastrous depression of the early '30s may be seen in the fact that the national income was more than halved between 1929 and 1932. From this low level, substantial progress was made in raising the national income to a total of almost $71,000,000,000 in 1939, a mark well below the average for 1926–29 in dollar terms. The period of economic recovery from the bottom of the depression to the last year of peace in Europe was marked by recession in 1938.

This brief account of the movement of national income in the United States between the two great wars relates to the net value of output in current dollar terms. The estimates, consequently, are affected by the general level of prices as well as by the physical quantity of goods and services produced. Since for many purposes the physical quantity of national production, or real national income, is required, a series depicting this volume is also shown in Table I, average prices of 1935–39 being used as a base. Entirely adequate price information for adjusting the national income in current dollar terms is not available, but the estimates in Table I are sufficiently accurate for most purposes. There are two interesting points to be observed in connection with these estimates of real national income.

The first is that the year-to-year changes in the total are considerably less violent than in the estimates of national income in current dollars. The depression of 1921, for example, was largely accounted for by a drop in prices rather than by a decline in physical output of goods and services. The depression of the early '30s was also partly a result of price movements, although in this instance the decline in real income was very substantial. On the other hand, the recession of 1938 was to a lesser degree accounted for by a decline in prices. It may be noted, however, that the volume of output after adjustment for price changes was higher in 1939 than in 1937, whereas the reverse was true of national income in current dollars.

Table II.—*U.S. National Income by Industrial Origin*

(In 000,000,000s of dollars)

Industry	1929	1932	1937	1939	1940	1941*
Total National Income	$83.4	$40.0	$71.4	$70.7	$77.1	$94.5
Agriculture	7.3	2.6	6.4	5.8	5.3	7.4
Mining	1.9	.5	1.6	1.3	1.7	2.0
Manufacturing	20.4	6.1	17.5	16.4	20.1	27.6
Contract Construction	3.5	.8	1.8	2.1	2.5	3.7
Transportation	7.1	3.7	5.2	5.0	5.4	6.4
Trade	11.1	5.1	10.0	9.6	11.6	13.2
Power and Gas	1.4	1.1	1.4	1.4	1.5	1.6
Communication	1.0	.7	.9	.9	1.0	1.1
Finance	9.4	5.0	6.4	6.1	6.8	7.4
Government	6.3	6.5	9.0	9.9	10.2	11.8
Service	9.9	5.7	8.6	8.8	7.4	8.0
Not Allocated	4.0	2.4	3.2	3.4	3.6	4.4

Source: U.S. department of commerce. *Preliminary.

The second is that the comparison between the general level of national output in the '30s as against the '20s is more favourable to the latter decade if real output is used than if the money value of output is used. In other words, the lower level of the national income in the '30s is partly accounted for by the lower prices prevailing in that period. It is most striking, for example, that the real national income in both 1937 and 1939 exceeded that of 1929. Furthermore, the real national income in 1939 was 50% above 1919, whereas the current dollar value showed less than a 5% increase. This large rise in real output is a reflection of the increase in the capital and labour resources being utilized in the productive process and also of the tremendous advances in productive efficiency occasioned by technological development. So far as the importance of the latter factor is concerned, it is significant that the larger quantity of output in 1939 over 1919 was achieved with a smaller percentage utilization of the available productive capacity of both men and machines.

In assessing the importance of the rise in national income over time, it is also essential to take account of the increase in population. As population rises, there are, of course, more persons to share in the goods being produced for present and future consumption and also more hands available for contributing to total output. The changes in income produced per capita after adjustment for fluctuating prices are shown in Table I. Real income per capita in 1937 and 1939 was about equal to the per capita real income in 1927 and 1928. It did not exceed the level reached in 1929 although the difference between 1929 and 1939 was relatively small. In comparing the change from 1919 to 1939, it may be noted that about half of the 60% rise in aggregate real income represented a gain in per capita income.

Rise in National Income after 1939.—The outbreak of World War II marks 1939 as the end of a definite phase in the economic life of the nation. For, as the dramatic and swift invasion of the Low Countries and the conquest of France revealed the unpreparedness of the United States in the face of possible aggression, a huge rearmament program was undertaken. This was to have a powerful influence on the level of economic activity and, consequently, upon the size of the national income. The stimulus provided by the defense effort was already evident in 1940 when the national income rose more than $6,000,000,000, even though the program was not inaugurated until the middle of that year. It was not until 1941, however, that the full impact of the rearmament program became apparent. For in that year, as previously noted, the national income rose by $17,000,000,000. The magnitude of the advance occasioned by the armament effort might, perhaps, be better realized from the fact that the national income increased from an annual rate of approximately $75,000,000,000 in June 1940 to about $104,000,000,000 in Dec. 1941. Since the economic system at that time was operating with much less than the full potential of the labour power that could be utilized in the productive process, and since the necessities of modern war demanded an all-out effort requiring the full use of available labour, it was confidently expected that the national income would rise well above the Dec. 1941 rate in the course of the war effort. This could be accomplished through an increase in the number of gainfully employed persons, an increase in working hours and the utilization of new productive facilities. The data in Table I show that rising prices were not without their influence on national income in 1941, even though the large part of the rise represented an increase in real income. In comparison with a rise in current dollar income of more than 20%, the rise in real income was about 15%.

Table III.—*U.S. National Income by Distributive Shares*

(In 000,000,000s of dollars)

Shares	1929	1932	1937	1939	1940	1941*
Total National Income	$83.4	$40.0	$71.4	$70.7	$77.1	$94.5
Total Compensation of Employees	52.7	31.5	47.8	48.1	52.6	64.7
Salaries and Wages	52.2	30.9	44.6	44.3	48.9	61.1
Supplements to Salaries and Wages	.4	.6	3.2	3.8	3.7	3.6
Net Income of Corporations	7.2	—3.6	3.9	3.8	5.6	7.3
Net Dividends	5.9	2.7	4.8	3.8	4.3	4.7
Corporate Savings	1.3	—6.4	— .8	.0	.3	2.6
Net Income of Noncorporate Business	14.2	5.3	12.5	11.9	11.5	14.6
Agriculture	5.6	1.7	5.3	4.8	4.4	6.2
Other	8.6	3.6	7.2	7.1	7.1	8.4
Net Interest	5.9	5.7	5.0	4.9	5.2	5.3
Net Rents and Royalties	3.4	1.2	2.1	2.0	2.2	2.5

Source: U.S. department of commerce. *Preliminary.

As already mentioned, the dynamic element that pushed the national income forward at so rapid a rate after June 1940 was expenditures for war material, both by the U.S. government and by foreign governments. The relative totals of these armament expenditures were less than $2,000,000,000 in 1939, approximately $4,000,000,000 in 1940, and about $15,000,000,000 in 1941. Because of this rapid rise, war or defense expenditures were taking an increasing share of the national income over this period, despite the rapid rise in national income itself. In 1940 the defense expenditures of the government alone represented less than 4% of the national income while in 1941 they represented about 15%. In fact, by the end of that year expenditures for the war effort represented about 20% of the current flow of national income.

In addition to the sharp advance in the output of war goods, however, there had been up to the last quarter of 1941 a substantial increase in the output of civilian goods for both consumption and capital purposes. The rise in output of consumers' goods in 1941 was estimated at over $8,000,000,000, part of which was accounted for by the increase in prices that occurred in that year. But, as the priorities and allocation system increasingly shut off the supply of materials for civilian uses, particularly in durable goods lines, it was evident that real curtailment in nonmilitary output was in store for the duration of the war. The president announced in his budget message to congress that the war effort would take about one-half of the national income in the fiscal year 1943 and, while the

Table IV.—*National Income (yearly average) in Selected Countries*

(In 000,000,000s of dollars)

Country	Period Covered	National Income*	National Income Adjusted for Differences in Prices: Income in "International Units"	Adjusted National Income per Head of Occupied Population†
United States	1925–34	$66.2	$66.2	$1,381
Canada	1925–34	4.49	5.08	1,337
New Zealand	1925–34	.83	.69	1,202
Great Britain	1925–34	20.4	21.9	1,069
Australia	1925–34	3.20	2.54	980
South Africa	1923	.96	.77	276
Switzerland	1925–34	1.79	1.92	1,018
Eire	1925–34	1.80	.83	705
Sweden	1925–34	1.88	1.73	653
Greece	24, 29, 34	.40	.92	397
Finland	1925–34	.44	.47	380
Hungary	1925–34	1.08	1.20	359
Yugoslavia	1925–34	1.50	1.35	330
Bulgaria	1925–34	.35	.52	284
Rumania	1925–34	.97	1.47	243
Netherlands	1925–34	2.06	2.62	855
France	1925–34	8.79	12.5	684
Denmark	1925–34	1.05	1.01	680
Belgium	1925–34	1.42	2.03	600
Norway	1925–34	.73	.61	539
Czechoslovakia	1925–27	2.12	2.82	455
Poland	1925–34	2.75	3.43	352
Germany	1925–34	15.2	17.6	646
Austria	1925–34	1.04	1.61	572
Italy	1928, 31	4.77	5.32	343
Latvia	1925–34	.20	.25	345
U.S.S.R.	1925–34‡	14.9	16.5	285
Estonia	1925–34	.11§	.14	341
Lithuania	1925–34	.16	.19	207
Japan	1925–34	..	..	353

Source: Colin Clark, *Conditions of Economic Progress* (London, New York, 1940).
*Concept differs slightly from one implicit in figures given in prior sections.
†In dollars; population as enumerated or estimated for 1930. ‡Average of 1928 and 1934. §1928.

total income would be much larger by that time, it was easy to see that goods available for civilian uses would necessarily be reduced.

It should be pointed out that the percentage of national income represented by war expenditures, though a reasonably good shorthand symbol for indicating the progress of the war effort on the economic front, is not a strictly accurate comparison. It can lead to serious misconceptions when the percentages of the various countries are compared. Firstly, the national income represents the net value of current output, whereas war expenditures represent sums of money actually paid and are, in this sense, a gross value aggregate. Even more important for international comparison is the fact that the national income represents only the output currently produced, whereas defense expenditures include purchases out of the existing stock of capital both at home and abroad. For example, the high figures of close to 60% representing the percentage of war expenditures to national income in Great Britain and Germany were possible only because a sizeable part of the defense expenditures was offset by liquidation of existing capital and purchases outside the territorial confines of those countries. In the case of Great Britain, the purchases out of the current national income would be more nearly in the neighbourhood of 40%. Since the United States had limited possibilities for purchasing abroad and since the pressure for liquidating domestic capital was much less, it was not to be expected that the percentage of national income represented by war expenditures would be as large as in Great Britain or Germany.

Industrial Origin of National Income.—An analysis of the industrial origin of national income is presented in Table II. The figures for each industry represent the net product of that industry, that is, the products of other industries used by each is excluded from the total representing the various industrial categories. For example, the coal utilized in manufacturing is shown as a product of mining and not in the net value of manufacturing output.

Considering that the impetus to the expansion of the national income since 1939 came from outlays for armaments and armament-producing facilities, it is not surprising that the output of the manufacturing and contract construction industries increased more substantially than that of other areas of the economy. As against an increase in total national income from 1939 to 1941 of a third, the net value of manufacturing output rose almost 70% and that of contract construction more than 75%. In this regard, the armaments boom was similar to the durable goods investment booms of earlier periods. It is also evident from Table II that the rearmament program continued the upward trend of the net output of government that had been one of the major characteristics since 1930.

Distributive Shares of the National Income.—An analysis of the national income in terms of the shares distributed or accruing to the various factors of production is presented in Table III. As the distributive shares represent, in a sense, the costs of producing current output of goods and services, they are in total necessarily equal to the national income which measures the net value of current output.

The changes in the distributive shares of the national income since 1939 were similar to those which usually characterize an upswing in economic activity. Salaries and wages increased by the largest absolute amount, primarily because they account for so large a fraction of total income. On a percentage basis, the largest advance of the period was in net income of corporations, despite the sharp rise in federal tax liabilities. Since net corporate income can fluctuate from negative to positive values, it is the most volatile element in the national income over the course of the business cycle. It should be kept in mind that this breakdown of distributive shares is not designed for throwing light on ethical questions of the size distribution of income and is not readily adapted to that purpose. One of the main reasons for this is that the various capital returns are all net in one sense or another, whereas salaries and wages represent gross income. The net income of corporations, for example, is shown after deductions for taxes, but not after taxes paid by the dividend recipient.

International Comparison of National Income.—Comparison of national income from one country to another is a difficult task because the concepts of national income used are not always similar and because prices prevailing vary widely from one country to another. In Table IV is presented the national incomes of various countries with the income statistics all converted to a common unit of purchasing power. They are taken from Prof. Colin Clark's book, *The Conditions of Economic Progress*, published by Macmillan. Inasmuch as the total income of any country is partly a reflection of its comparative size, Professor Clark has also calculated the national income per head of employed population. This measure provides a fairly good indication of the differences in productivity among the various nations. (*See* also BUDGETS, NATIONAL; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; NATIONAL DEBTS; WEALTH AND INCOME, DISTRIBUTION OF.) (M. GT.)

National Labor Relations Board.

In its sixth year, the National Labor Relations board in 1941 was summoned to a period of its greatest activity by the necessity of meeting labour problems in expanding U.S. defense industries. There were presented to the board in excess of 11,000 cases—nearly 5,000 more than in the year 1940. The only other year in which there was as great a recourse by workers to the National Labor Relations act was in 1938, the year in which a pent-up flood of cases was brought to the board following the upholding by the supreme court of the constitutionality of the act.

The year 1941 was also distinguished by a remarkable increase in the use of the board's machinery to conduct employee elections. The question of employee representation in previous years had been raised in about one-third of all board cases, while the other two-thirds concerned charges of unfair labour practice. In 1941 the representation cases brought to the board were twice those of the previous year and for the first time outnumbered the unfair labour practice cases brought to the board.

The board as early as March announced that it would give priority of handling to defense cases. The need of employers to know with whom they should bargain, and the pressure for recognition of majority bargaining rights in many defense plants, made speed in handling such cases a first concern. The board was able to conduct elections in an average time of three weeks from the filing of a petition for an election to the balloting itself, and in many cases the period was reduced to one week. The holding of elections by consent of all parties, instead of a public hearing and a board determination, obtained in four cases in five and contributed to the speed of their handling.

The year was likewise notable for the ending of litigation against several big employers charged with unfair labour practice. Compliance with board decisions was in each instance followed either by board elections or pay roll checks to determine employee representation, and in several outstanding cases written trade agreements resulted.

Among the large elections held in 1941 were those at the Ford Motor company, involving more than 80,000 workers at the Lincoln and River Rouge plants; Republic Steel corporation, involving 40,000 workers at 15 plants; Bethlehem Steel company, involving 72,000 workers at 26 plants; Inland Steel corporation, involving 12,000 workers and Youngstown Sheet and Tube company involving 20,000 workers. Each of these companies subsequently made collective bargaining agreements with the union certified as the bargaining representative.

During the year 1941 the board made important administrative changes. A field division was created and made responsible for administrative work in the board's 22 regional offices and for administrative case work.

For the expeditious handling of uncomplicated representation cases the board instituted a new policy of assigning regional office employees as trial examiners to hear such cases. Further savings of time and reports of better quality were secured by attaching attorneys to assist trial examiners in the preparation of intermediate reports, and by transference of cases to the board immediately upon the filing of intermediate reports.

The staff of the board remained the same in size, with approximately 450 employees in Washington and 350 attached to the 22 regional offices. Approximately four-fifths of all cases were closed in regional offices, the great majority of these by informal methods and without holding public hearings.

The board's litigation record for its first six calendar years stood at the end of 1941 as follows: Board orders enforced in full or with modification by the supreme court, 32; board orders denied enforcement by the supreme court, 2; supreme court cases involving other questions: 6 decided favourably to the board, 1 decided unfavourably; petitions by employers for review of circuit courts of appeals decisions favourable to the board: 51 denied by the supreme court; petitions by the board for review of circuit courts of appeals decisions unfavourable to the board: 3 denied by the supreme court. During the six years, the circuit courts of appeals enforced in full or with modification 242 board orders and denied enforcement of 56 board orders. (*See* also LABOUR UNIONS; STRIKES AND LOCK-OUTS.) (H. A. Ms.)

National Lawyers' Guild.

The national executive board, at its October meeting, invited the collaboration of the American Bar association, the National Bar association and all other national associations of lawyers, to mobilize the skill and training of the entire bar for participation in the military, economic, social and civil activities necessary to carry on the war. Similar proposals were made by chapters to local bar associations in their respective communities. The committee on taxation issued and distributed two booklets analyzing the existing federal tax structure and proposing amendments to existing tax laws to provide more adequate revenue by reaching sources better able to pay. The Philadelphia Neighborhood Law Office project successfully concluded its experimental stage and it was decided to continue this legal service for persons in the low income group as a permanent institution.

The officers of the guild elected at the fifth annual convention in Detroit were: President, Judge Robert W. Kenny; executive secretary, Martin Popper. The editor of the official publication, the *Lawyers' Guild Review*, was Benjamin Algase. (M. PR.)

National Monuments: *see* NATIONAL PARKS AND MONUMENTS.

National Parks and Monuments.

The silver jubilee of the National Park service was celebrated in 1941. While Yellowstone was set aside

is a national park in 1872, it was not until 1916 that the National Park service was created as a bureau of the department of the nterior. During the 25th anniversary of this event, the National Park service gave close scrutiny to operations in relation to the charge made by the creative legislation—"to conserve the scenery ind the natural and historic objects and the wild life therein, ind to provide for the enjoyment of the same in such a manner ind by such means as will leave them unimpaired for the enjoyment of future generations." These mandates outline the fundamental purposes of the national parks and present a delicate problem in keeping a proper balance between preservation and use.

In addition to the maintenance and operation of 164 federal park areas in 1941, the National Park service made further progress in the park, parkway and recreational area study which had been in progress for several years. Also, through the Civilian Conservation corps, assistance was given to the planning, development and improvement of state, county and municipal parks.

Under the Historic Sites act, Fort Raleigh in North Carolina, San José mission in San Antonio, Tex., and the Oregon City home of Dr. John McLoughlin were designated as national historic sites. Also, congress authorized the Coronado International memorial on the United States-Mexican border contingent upon the reservation of an equal amount of land by the republic of Mexico.

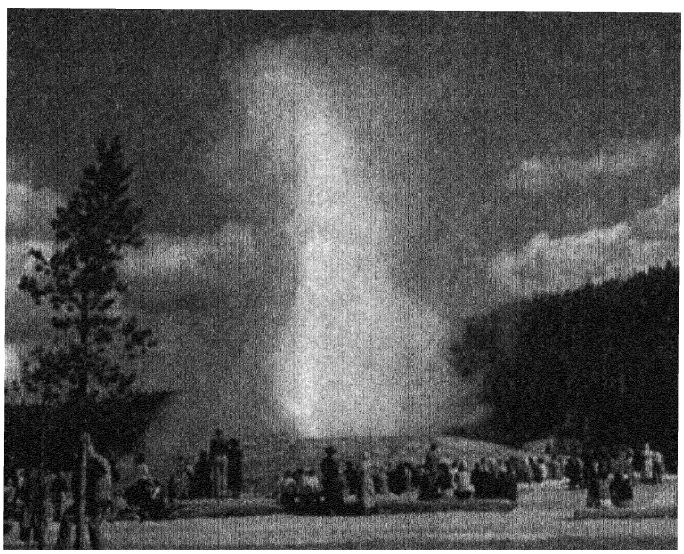
Texas appropriated $1,500,000 for the purchase of privately owned lands in the Big Bend National Park project, a big step toward the preservation and protection of this great area along the Rio Grande.

During 1941 more than 21,000,000 persons visited the national park areas. Included in this total were 335,000 members of the U.S. armed forces who were invited by the secretary of the interior to make use of the parks for scenic trips, historical tours and recreation, with all entrance fees waived.

With the challenge of national defense before the nation, the National Park service continued to make the national park areas of service to the people for public appreciation under proper safeguards and for building of pride in the U.S. national heritage.

The wisdom of national park and monument preservation is measured not so much in terms of the number of visitors as in their benefit from the experience. The comments of millions of visitors show that the highest and fullest enjoyment can be had only if the natural and scenic features are preserved and if the historic, prehistoric and scientific resources are fully safeguarded. Primitive wilderness characteristics in the national parks give to them a grandeur which will add increasingly to their distinctiveness as these qualities disappear elsewhere. (N. B. D.)

VISITORS TO "OLD FAITHFUL" in Yellowstone national park in the summer of 1941. An all-time record total of 581,761 persons visited the park during the fiscal year Oct. 1, 1940–Sept. 30, 1941



National Science Fund: *see* NATIONAL ACADEMY OF SCIENCES.

National War Labor Board: *see* DEFENSE MEDIATION BOARD, NATIONAL.

National Youth Administration.

The National Youth administration provides unemployed young men and women with practical experience and training designed to prepare them for jobs in private industry, and also enables students in schools and colleges to earn the money they need to continue their education.

During the month of October 1941 approximately 544,000 young people were employed on the work programs of the National Youth administration, of whom 294,000 were students employed by the NYA while attending schools and colleges, and 250,000 were out-of-school youths employed on work projects.

The out-of-school program of the NYA was geared to meet the demands of the bottleneck defense industries for experienced and trained workers. In NYA workshops and resident centres young people were given on-the-job training in such jobs as welding, sheet metal work, aviation mechanics and electrical work. Working under factory conditions NYA youth developed not only skills and techniques but also work habits necessary for defense employment. During the 12 months of 1941 more than 400,000 out-of-school youths secured jobs in private employment, primarily in national defense industries.

The National Youth administration was established by executive order of the president on June 25, 1935. Originally set up within the Works Progress administration, the NYA was transferred to the Federal Security agency on July 1, 1939.

The National Youth administration operates on a decentralized plan, with a state youth administrator in each state, as well as in Alaska, District of Columbia, Hawaii and Puerto Rico, who has a major share in the planning and direction of the program. A national advisory committee, representing industry, labour, education, religion, agriculture and youth, advises the president on policies and activities affecting the NYA. There are advisory committees in every state and in about 1,000 local communities which assist in fitting the NYA to local needs and conditions. Administrator of NYA in 1941: Aubrey Williams.

From its establishment through June 1941 the National Youth administration provided jobs for 1,772,000 out-of-school youths and provided jobs for 1,803,000 students to enable them to work their way through schools and colleges. (A. Ws.)

Natural Gas: *see* GAS, NATURAL.

Nauru: *see* MANDATES; PACIFIC ISLANDS, MANDATED.

Navies of the World.

An inevitable result of the widespread war at sea was to give an impetus to the development of new tactics, new types of ships, new weapons and new methods of using them.

So severe were German submarine losses in the early months of World War II through the efficiency of the British "Asdic" detection gear that new tactics were subsequently followed by the U-boats. Instead of attacking in submerged condition during daylight, their depredations were usually carried out on the surface at night, when their low silhouette was not easily spotted.

To meet this menace, the star-shell, originally devised to light up destroyers attacking a fleet under cover of darkness, was being used extensively to reveal submarines trying to torpedo merchant vessels in convoy.

New, or rather modified, types of warships included the corvette, which is a cross between the "whaler" of World War I and the fast patrol vessels known in those days as "P-boats." Corvettes were turned out in hundreds for the royal navy and royal

Canadian navy and proved themselves invaluable for the work of escorting convoys across the Atlantic. Another type developed considerably in scope and design was the motor torpedo boat. Germany knows these craft as *schnellboote,* though the practice of referring to them as "E-boats" puzzled the public, who imagine them to be much more formidable than the reality. Before the war the Italians were proud of their vessels of this category, officially classed as M.A.S. (*motoscafi anti-sommergibili*), but these had accomplished singularly little. In the abortive attack on Valetta harbour, Malta, they lost heavily.

Yet another type which underwent development is the anti-aircraft ship. British cruisers of the Dido class are primarily designed for anti-aircraft duties, and a number of obsolescent destroyers were rearmed for the same purpose. On the German side one heard frequent mention of "flak" ships, which mostly appeared to be trawlers and other vessels of mercantile type armed with high-angle guns.

New weapons included the magnetic and acoustic mine, both of which were largely laid by aircraft. Torpedo attack from the air underwent extensive development, although it was in the experimental stage during World War I. The disabling of the Italian fleet at Taranto in Nov. 1940 and the crippling of the German battleship "Bismarck" in May 1941 were outstanding examples of the success of torpedo attack from the air.

The year 1941 witnessed the appearance of three new British and two new American battleships of 35,000 tons, outweighing the almost simultaneous completion of two German units of somewhat heavier type (about 40,000 tons), one of which was brought to action and destroyed.

Aircraft carriers proved their value repeatedly in connection with the British torpedo attacks from the air already referred to, as well as in the bombing of naval bases and in repelling enemy air attacks in the Mediterranean. Nothing had been seen at sea up to the closing months of 1941 of the two aircraft carriers which the Germans were building when war began. One of them had certainly been completed, but from the fact that no use had been made of it, it may be surmised that it either proved unsatisfactory, or received serious damage which disabled it.

An American aircraft carrier was completed during 1941, and in addition to 11 under construction, two or three merchant ships had been taken in hand for conversion into "escort aircraft carriers."

In cruisers the inferiority of the axis powers was manifest. It appeared as if Germany had only three heavy and three light cruisers left in service, and one of the former was blockaded at Brest, France. Italy might still have possessed three heavy and ten light cruisers of modern design. Against these slender forces the British fleet could muster more than twice as many of the former and four times as many of the latter.

The United States navy had a heavy program of cruiser construction in hand, which would ultimately more than double its effective strength in that category. It included half a dozen vessels which, from the meagre particulars that were available, would apparently be battle cruisers of a new and powerful design.

Very little could be said about the Japanese navy. This was because, so far as the veil of secrecy which enshrouded it could be penetrated, progress with the construction of new ships was latterly being very slow. This was doubtless owing to the shortage of steel and other materials needed for the completion of the four or five battleships and sundry other vessels that were in hand.

Though its geographical situation was not favourable, the Russian navy appeared to have been actively engaged in the Baltic, Black sea and Arctic ocean during the latter half of 1941. Its operations were largely concerned with the interruption of enemy convoys carrying troops and supplies, and in bombarding enemy land forces at such points as Tallinn, Kronstadt and Odessa. Russian naval aircraft were also busy and claimed some successes. Submarines, of which the soviet government could dispose of a large number, were used with effect in the Baltic.

This brings into consideration the number of underwater craft in the axis fleets. Though the losses of both were heavy, there is little doubt that the Germans were continuing to build submarines in large numbers. According to a Swedish estimate, there were seldom less than 150 at sea, excluding those under refit.

In Italy the position might have been different, since losses were not believed to have been made good to any appreciable extent.

British submarine construction remained a secret, but the names of sundry new vessels not provided for when the war began were published from time to time. In the U.S. navy, construction was proceeding rapidly, the number of new submarines in hand amounting to nearly two-thirds of those already in service. Japan was believed to be building as fast as circumstances permitted, influenced in this respect no doubt by Germany's example.

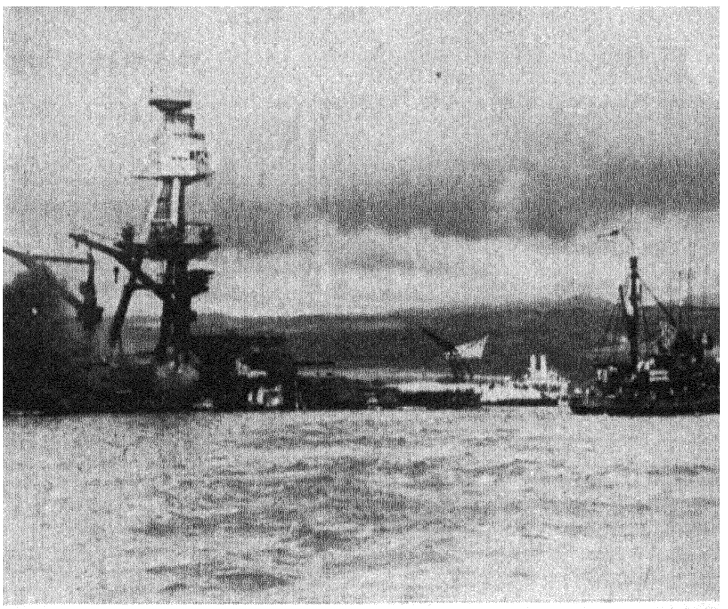
British Naval Strength.—Before summing up the strength of the royal navy in ships at the end of 1941, it may be well to take a glance at the losses incurred since the war began in Sept. 1939. These comprised 4 capital ships, 3 aircraft carriers, 13 cruisers, 2 of which had been rearmed for anti-aircraft duties, 59 destroyers (including 3 of those transferred from the U.S. navy), 32 submarines, 1 fast minelayer, 6 sloops, 5 fleet minesweepers, 1 monitor, 5 gunboats, 8 corvettes, 128 trawlers, 16 drifters, 14 armed merchant cruisers, 13 armed yachts, 7 auxiliary minesweepers, 2 fleet tugs and 18 miscellaneous auxiliaries.

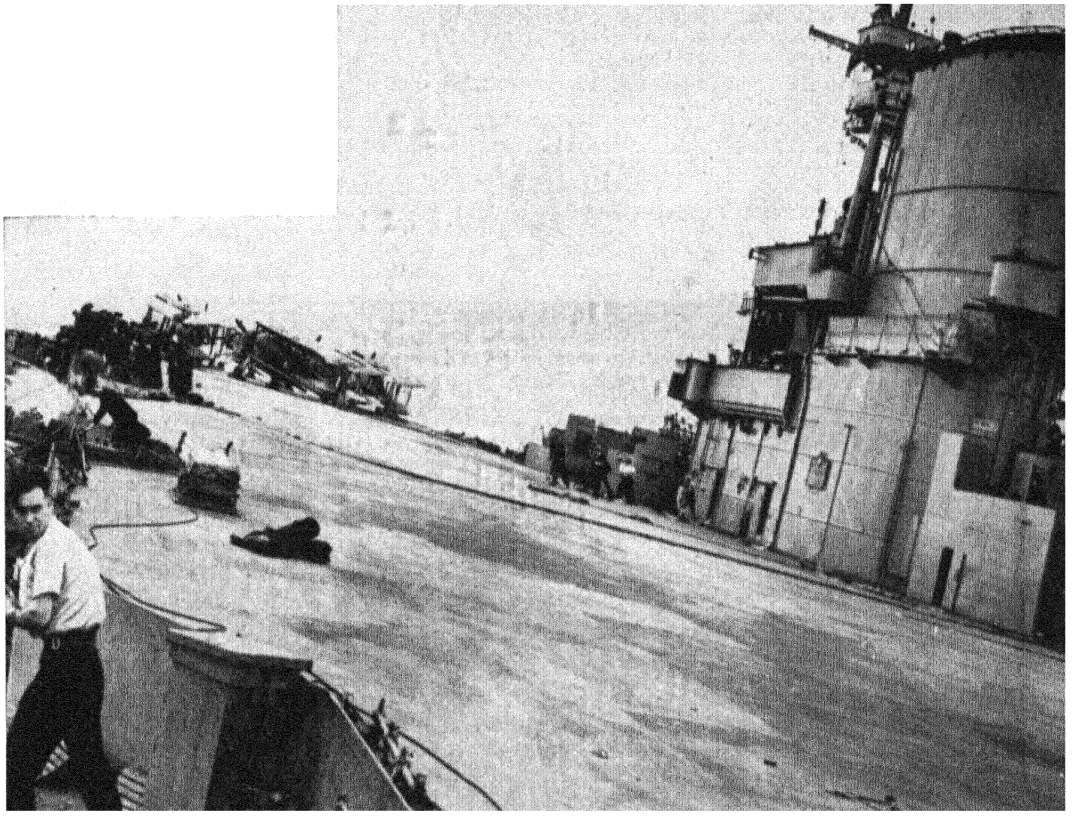
After allowing for these losses, and for such new ships as were known to be due for completion by the end of 1941, the strength of the royal navy in Dec. 1941 might be reckoned as not less than 13 battleships, 1 battle cruiser, 7 first line aircraft carriers, 67 cruisers (of which 14 were heavy ships with 8-in. guns), 4 minelayers, more than 260 destroyers, 52 submarines, 47 sloops, about 100 minesweepers, about 200 corvettes, 3 aircraft tenders, 2 netlayers, 2 monitors, 17 river gunboats, 6 coastal minelayers and a very large but unstated number of motor torpedo boats and motor gunboats. Trawlers, drifters and mercantile auxiliaries of all descriptions were too numerous for an estimate to be possible.

Of ships on order at the outbreak of war there were probably still in hand 6 battleships, 2 aircraft carriers and 4 cruisers. Naturally a great many more cruisers, destroyers and smaller craft must have been put in hand since.

Naval forces of the dominions, including the royal Indian, royal Australian, royal Canadian and royal New Zealand navies, as well as the Newfoundland and South African naval forces, are included in the above figures. Their personnel was known to have been increased greatly since war began, amounting to more than 15,000 for the royal Australian navy in 1941, while the royal Canadian navy expected to reach a total of 28,000 in 1942. Canada, it should be added, was building small warships, such as corvettes and mineswèepers, in large numbers, not only for its own service but also in some measure for the royal navy. Australia, besides providing for its own needs, was constructing corvettes for the royal Indian navy.

United States Naval Strength.—The biggest program of naval expansion in the history of the United States, designed to produce a "two-ocean" navy, was in full swing. Ships in service at the end of 1941 were: 15 battleships, 7 aircraft carriers, 18 heavy and 19 light cruisers, 179 destroyers, 111 submarines, more than 30 gunboats and patrol vessels, more than 100 submarine chasers, 20 seaplane tenders, 8 light minelayers, about 40 motor



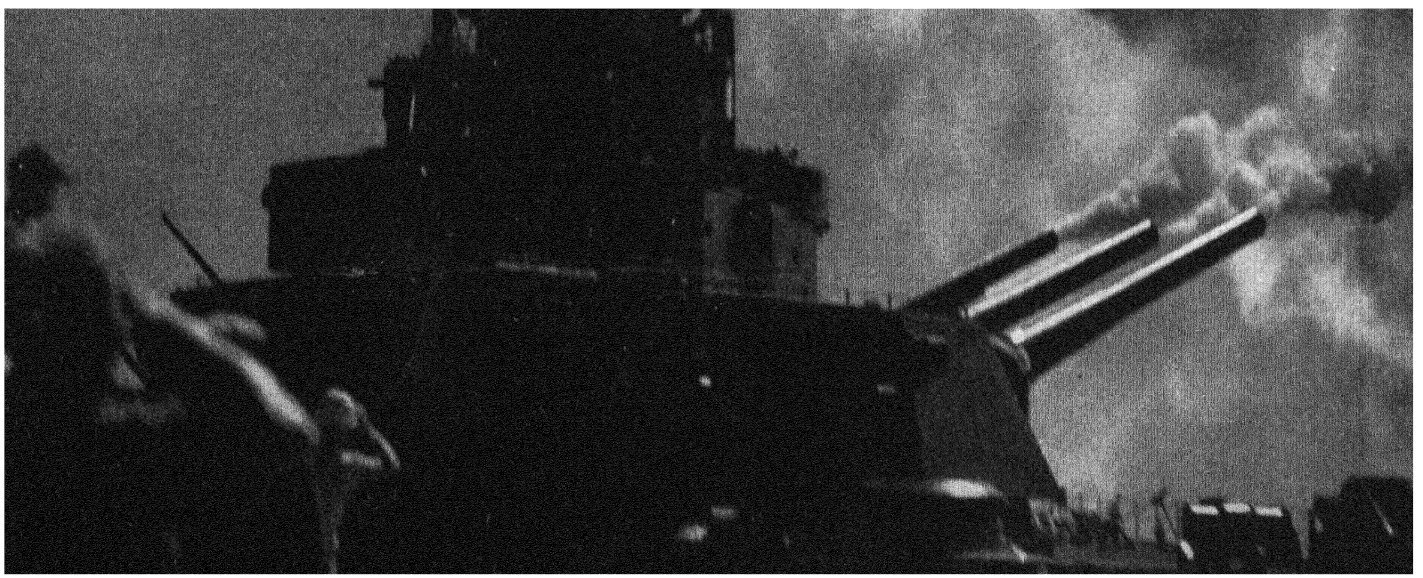


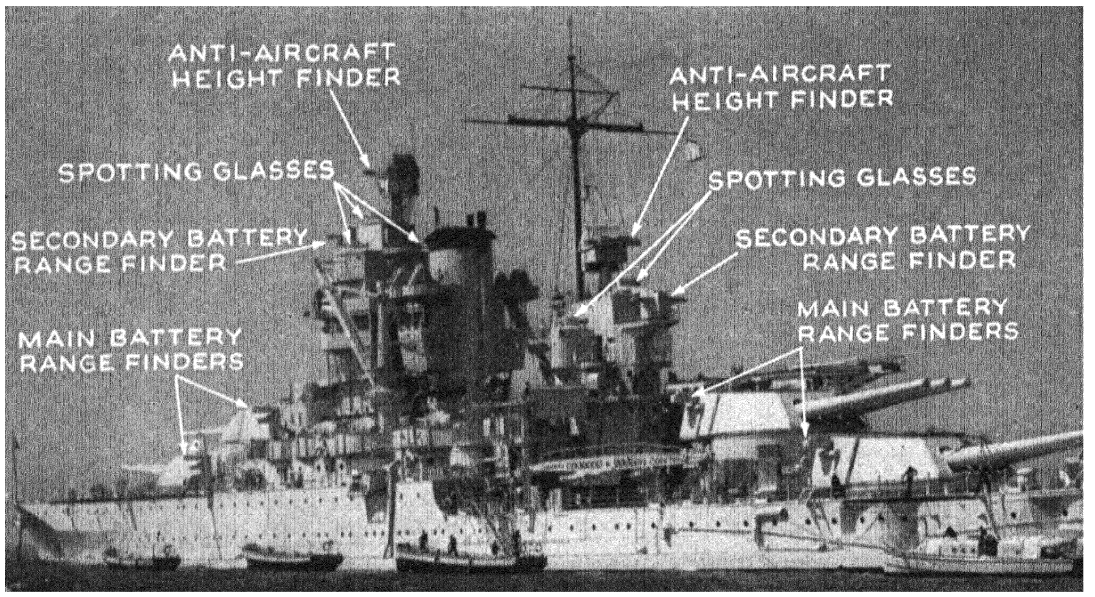
Above, left: SURVIVORS OF THE "BISMARCK" bobbing in the open sea May 27, 1941 after the great German battleship, victor over Britain's 42,000-ton "Hood" three days previously, was sunk by British gunfire and torpedoes

Above, right: THE U.S.S. "Arizona" resting on the bottom of shallow waters in Pearl Harbor, Hawaii, after it had been destroyed in the Japanese aerial attack of Dec. 7, 1941. Its flag is still flying.

Right: LISTING FLIGHT DECK of the British aircraft carrier "Ark Royal" shortly before the ship sank in the Mediterranean Nov. 14, 1941. It was torpedoed by an axis submarine off Gibraltar.

Below: THE MIGHTIEST SALVO in naval history was fired by the new U.S. battleship "North Carolina" in 1941. During a test at sea all nine of the ship's 16-in. guns, as well as ten 5-inchers, were fired simultaneously. The picture shows the guns of the rear turret during the test





LOCATION OF RANGE and height finders and salvo-spotting glasses aboard the U.S. battleship "Idaho"

torpedo boats and nearly 100 minesweepers.

Under construction or on order were 15 battleships, 6 battle cruisers, 11 aircraft carriers, 8 heavy and 40 light cruisers, 192 destroyers, 73 submarines, 19 seaplane tenders, 3 minelayers and more than 100 minesweepers, the exact number depending upon the rate at which these were completed.

A great many auxiliaries were also under construction or were being fitted out after being taken over from mercantile employment. It was hoped to have a total naval personnel of 369,000 by June 1942, besides 75,000 marine corps. (*See* also MUNITIONS OF WAR.)

Japan.—Though the utmost secrecy was preserved concerning new naval construction in Japan, it was believed that at the end of 1941 there were in service 10 battleships, 8 aircraft carriers, 12 heavy and 23 light cruisers, 108 destroyers 12 seagoing torpedo boats, more than 80 submarines, 6 aircraft tenders, 5 coast defense ships, 17 submarine chasers, 20 minelayers, 18 minesweepers and 14 gunboats.

Under construction were 4 or 5 battleships, 3 or 4 armoured ships resembling the German "pocket battleships" in design, 1 or 2 aircraft carriers and an unknown number of destroyers, submarines, minesweepers and submarine chasers. Personnel had been largely increased and was probably about 250,000.

France.—The French navy was split up to such an extent that its full strength could hardly be assembled. There were 8 battleships, of which 3 were in Algerian, Moroccan and West African ports, 1 demilitarized at Alexandria and two with the Free French forces; 1 aircraft carrier immobilized at Martinique, W.I.; 18 cruisers, of which 2 were in the far east, and in the West Indies, respectively, and 4 demilitarized at Alexandria; 53 destroyers, of which 7 were not available for service under the Vichy government; 11 seagoing torpedo boats, 5 of which were with the Free French; 68 submarines, of which 5 were unavailable; 2 coast defense ships; 2 minelayers; 1 netlayer; 1 aircraft tender; 7 sloops; and an uncertain number of patrol vessels, minesweepers and submarine chasers. Little or no new construction appeared to be in hand.

Italy.—After allowing for losses, Italy's effective strength amounted to 5 battleships, 3 heavy and 8 light cruisers, 2 obsolete cruisers of little fighting value, less than 40 destroyers, less than 50 seagoing torpedo boats, a residue of submarines, the total of which could not be determined without knowing the number lost, 2 sloops, 1 of which was in the far east, 1 aircraft tender, 9 minelayers, less than 40 minesweepers and sundry small craft of little importance, including perhaps 60 motor torpedo boats.

Germany.—German losses at sea had been heavy and its strength was reduced to 3 battleships, 1 of which was in the Baltic and 2 at Brest, France, 2 armoured ships ("pocket battleships"), 1 aircraft carrier, 3 heavy and 3 light cruisers, about 20 destroyers, about 30 seagoing torpedo boats, 1 sloop, 2 coast defense ships and an unknown number of submarines, motor torpedo boats and minesweepers, these being the vessels on which Germany was chiefly relying for carrying on the war.

U.S.S.R.—In spite of its entry into the war, very little more was known about Russia's navy than before. It included 3 obsolete battleships, 2 of which were in the Baltic and 1 in the Black sea, 1 aircraft carrier, 6 cruisers, 2 of which were in the Baltic and 4 in the Black sea, about 60 destroyers, about 20 seagoing torpedo boats, nearly 200 submarines and about 150 motor torpedo boats. Vessels in the last two categories were divided among the Baltic, Black sea and far east.

Other European Countries.—The Netherlands government had at its disposal, for service against the axis, 5 cruisers, 8 destroyers, 20 submarines, 3 sloops, 1 coast defense ship, 7 minelayers, 11 minesweepers and 13 motor torpedo boats. Many of these vessels were in the East Indies. In that territory the Prince Bernhard fund had collected money for the construction of a destroyer and a number of motor torpedo boats.

Norway retained, under the control of its government in London, a modern torpedo boat, a submarine and sundry small craft. A few vessels of small importance fell into German hands, but their fate since was unknown. In the case of Denmark, whose entire fleet fell into the hands of the invaders in April 1940, the only vessels which the enemy was definitely known to have manned were 6 small torpedo boats. This left under nominal Danish control 2 coast defense ships, 11 torpedo boats, 12 small submarines and some other ships of little importance.

Sweden was busily engaged in adding to its existing fleet, which comprised 2 cruisers, 8 coast defense ships, 9 destroyers, 10 seagoing torpedo boats, 16 submarines, 1 minelayer, 42 minesweepers and 6 motor torpedo boats. Two cruisers, 6 submarines and some other vessels were under construction, but 2 coast defense ironclads, which it was proposed to build, had not been laid down.

In the Finnish navy, so far as could be ascertained, there were a coast defense ship, 5 submarines, 10 minelayers, 7 motor torpedo boats and sundry small craft. Poland, with the addition of new ships built in England, had 5 destroyers, 5 submarines and some small craft, though 3 of the submarines were interned in Sweden.

Spain could utilize 6 cruisers, 16 destroyers, 6 submarines, 6 old torpedo boats, 6 minelayers and 2 sloops. Portugal possessed 5 destroyers, 3 submarines, 1 seagoing torpedo boat and 7 sloops. Turkey had an old battle cruiser, 4 destroyers, 7 submarines, 2 obsolete cruisers used for training purposes, 5 minelayers and 3 motor torpedo boats.

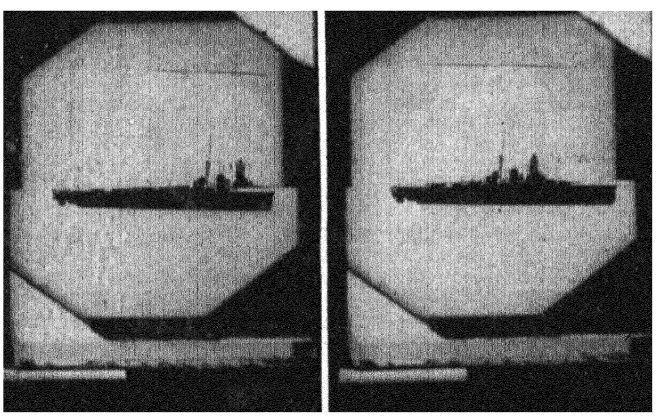
In spite of heavy losses suffered during the German invasion, the government of Greece still retained on active service 1 cruiser, 6 destroyers, 5 submarines and 3 old torpedo boats.

Rumania had, prior to the German attack on Russia, 4 destroyers, 3 submarines, 2 minelayers, 3 motor torpedo boats and 3 old torpedo boats and some vessels of minor importance. Presumably all of these were under Germany's control. One of the destroyers was reported to have been sunk in action.

In the Yugoslav fleet there were 4 destroyers, 4 submarines, 10 motor torpedo boats, 8 obsolete torpedo boats, 1 patrol vessel and some minor warships. Most of these, if not scuttled, were believed to have fallen into Italian hands.

South America.—Though the war had suspended all construction in Europe of warships for South American states, some of them were building ships in their own dockyards, notably Argentina, Brazil and Chile. The Argentine navy included 2 old battleships, 3 cruisers, 15 destroyers, 3 submarines, 4 old coast defense ships, 14 minesweepers and a few other vessels of little importance. Two sloops were under construction. In the Brazilian fleet there were 2 old battleships, 2 cruisers, 1 destroyer, 6 torpedo boats, 4 submarines, 8 minelayers and 2 minesweepers. Nine destroyers were under construction at Rio de Janeiro. Chile had 1 battleship, 3 cruisers, 8 destroyers and 9 submarines. A sloop was being built. Other South-American navies had altered little. Peru possessed 2 cruisers, 2 destroyers and 4 submarines. Colombia had 2 destroyers and 3 gunboats. Mexico could muster 5 sloops and some patrol craft; Cuba, 2 sloops and some small gunboats; Uruguay had a sloop and 3 patrol vessels; Venezuela, 4 gunboats. Paraguay had 3 river gunboats; Haiti, 2 tiny patrol vessels; the Dominican Republic, 3 patrol vessels and Nicaragua 1.

Asia.—China had had its navy extinguished as the result of the Japanese operations, but the puppet government of Wang Ching-wei had been



FINDING THE CORRECT RANGE of a target at sea through the eyepiece of a warship's range finder. When the target is out of coincidence (left) the range is incorrect; the finder is then adjusted until the image of the target is in coincidence (right)

Table I.—*Navies of the World as of Dec. 31, 1941*

Country	Battleships and battle cruisers	Aircraft carriers	Cruisers	Coast defense ships	Destroyers	Torpedo boats	Submarines
British Empire*	14	7	67	2	260?	?	52
U.S.A.	15	7	37	..	179	30	111
Japan	10	8	35	5	108	..	80
Vichy France	5	1	14	2	46	6	63
Italy*	5	..	13	..	40?	110?	?
Germany*	3	1	8†	2	20	?	?
Russia	3	1	0	..	60	170	200
Turkey	1	..	2	..	4	3	7
Greece	..	..	1	..	0	3	5
Spain	..	..	6	..	15	0	6
Sweden	..	..	2	8	9	16	16
Netherlands	..	..	5	1	8	13	22
Norway*	..	..	..	..	..	1	1
Denmark	..	..	..	2	..	17	12
Finland	..	..	..	1	..	7	5
Poland	..	..	..	..	5	..	5
Portugal	..	..	..	..	5	1	3
Rumania	..	..	..	..	4	6	3
Yugoslavia	..	..	..	..	4	18	4
Argentina	2	..	3	4	15	..	3
Brazil	2	..	2	..	1	6	4
Chile	1	..	3	..	8	..	9
Peru	..	..	2	..	2	..	4
Colombia	..	..	..	..	2	..	..
Thailand	..	..	..	4	1	18	3

*Full details not available owing to war conditions.
†Including 2 "pocket battleships."

presented with some salvaged and patched-up warships by its Japanese overlords. These comprised 2 cruisers, 1 sloop and 7 miscellaneous gunboats, so far as could be ascertained.

The navy of Thailand (Siam) was in action against a French squadron in the early days of 1941, suffering some losses as a result. It still included 4 coast defense ships (one of which was driven ashore but was believed to have been refloated), 1 destroyer, 10 torpedo boats, 3 submarines, 2 sloops and 8 motor torpedo boats, besides smaller vessels. There was no news of the 2 cruisers which were ordered in Italy before the war, and it was doubtful whether they would ever be finished.

Though some of its ships were badly knocked about in resisting the British landing, Iran had 2 sloops and 4 gunboats, besides a few smaller craft. Manchoukuo still had an ex-Japanese destroyer of an early vintage, and a collection of gunboats and patrol vessels numbering about 30, most of which were on river service. This also applies to the employment of 4 patrol vessels maintained by the government of Iraq.

As already explained, only those countries concerned in World War II were able to dispose of the necessary materials for naval construction at the time of writing.

For convenience of reference Table I shows the strength in the principal categories of warships of the navies of the world at the end of 1941. (*See* also AIR FORCES OF THE WORLD; ARMIES OF THE WORLD; BLOCKADE; DEFENSE, NATIONAL [U.S.]: *Armed Forces;* MUNITIONS OF WAR; SHIPBUILDING; STRATEGIC MINERAL SUPPLIES; SUBMARINE WARFARE; UNITED STATES: *History;* WORLD WAR II.) (F. E. McM.)

Table II.—*Comparative Naval Strength of Chief Warring Powers

Type	Built	Building	Total
ALLIED NAVIES			
United States			
Battleships	16	15	31
Aircraft carriers	7	11	18
Cruisers	37?	54	91
Destroyers	171	191	362
Submarines	113	73	186
Great Britain			
Battleships	14	6?	20?
Aircraft carriers	7	3	10
Cruisers	62–64	12–14	74–78
Destroyers	205–225	?	205–225?
Submarines	45–50	?	45–50?
Russia			
Battleships	3?	3	6?
Aircraft carriers	1	2	3
Cruisers	9?	4	13?
Destroyers	60–65?	30–35	90–100?
Submarines	140–175?	?	140–175?
Netherlands Indies			
Cruisers	3	...	3
Destroyers	8	...	8
Submarines	15	...	15
AXIS NAVIES			
Germany			
Battleships	3†	2	5
Aircraft carriers	1	1	2
Cruisers	9	6	15
Destroyers	45–50	?	45–50?
Submarines	130–160	?	130–160
Japan			
Battleships	10?	4–8‡	14–18
Aircraft carriers	7–9	?	7–9?
Cruisers	44–46	10?	54–56?
Destroyers	126	10–15?	135–141?
Submarines	69–70	7–10?	76–80?
Italy			
Battleships	5?	2	7?
Aircraft carriers	...	...	...
Cruisers	16	14	30
Destroyers	90–105?	12?	102–117?
Submarines	80–85	15–18	95–100

Taken from *New York Times* of Dec. 14, 1941.
*Corrected for known losses up until Dec. 12.
†—In addition there are two "pocket battleships."
‡—Possibly includes 4 "pocket battleships," some of which may be in service.

Navy, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Nazis: *see* ANTI-SEMITISM; ARGENTINA; FASCISM; GERMANY; SOUTH AFRICA, THE UNION OF.

NDMB: *see* DEFENSE MEDIATION BOARD, NATIONAL.

N.E.A.: *see* NATIONAL EDUCATION ASSOCIATION.

Nebraska, One of the states formed from the Louisiana purchase, Nebraska lies in the lower Missouri valley in the west north central part of the United States; admitted to the union in 1867; area, 76,653 sq.mi.; population, 1940, 1,315,834, a decrease of 62,129 from 1930; capital, Lincoln (81,984). In 1940, 39.1% of the population was urban. In 1930 the Negro population numbered 13,752 and the foreign-born, 115,346.

History.—State officers for 1941–43 were: governor, Dwight Griswold; lieutenant governor, William E. Johnson; auditor, Ray C. Johnson; secretary of state, Frank Marsh; treasurer, L. B. Johnson; chief justice, Robert G. Simmons. Alone among the 48 states Nebraska has a one-house legislature, the 43 members of which are chosen for two-year terms on a nonpartisan ballot.

Education.—Elementary and secondary education is under the control of local school districts, of which there were more than 7,000 in 1941. The total enrolment in elementary and secondary schools in 1940 was 276,188 and the teaching staff numbered 13,759. Expenditures amounted to $20,427,683. Higher education is supported by the state at the University of Nebraska and in four teachers' colleges. Total enrolment at the state university for 1940–41 was 12,129, of whom 9,061 were resident students of collegiate grade. The faculty numbered 500. The biennial appropriation for 1941–43 was $8,028,775 (including federal grants). Total enrolment at the teachers' colleges in 1940–41 was 4,037; the teaching staff numbered 210. The state appropriation for 1941–43 was $1,420,759.

Public Welfare, Charities, Correction.—The appropriation for public assistance for 1941–43 was $20,285,362. During the year ended June 30, 1941, the recipients of general relief numbered 122,714 and total monthly payments averaged $1,161,835; persons on WPA projects totalled 245,768 and received a total monthly average of $12,917,399; during the same year a monthly average of 1,722 children received $165,092 in payments under mothers' pension laws, and more than 700 blind persons received $171,422 in blind pensions. The state maintained seven correctional institutions with a total of 1,244 inmates in 1941, and ten others for dependents with a population of 6,541; 3,043 inmates were on parole in 1941. During the biennium 1939–41, total expenditures of the 17 institutions amounted to $6,581,205; the total appropriated for 1941–43 was $4,865,179.

Communications.—The total highway mileage of the state in 1941 was 100,162. Of this, 11,220 mi. had been designated as part of the state system of highways and 9,000 mi. had been marked and were maintained by the state. Of this latter figure 3,804 mi. were hard surfaced, 4,784 gravelled and 412 of earth. The total sum obligated for new construction during 1939 and 1940 was $16,099,657. As of Nov. 1, 1941, there were 48 airports and landing fields in the state, most of them managed by the municipalities. Railroad mileage in the state in 1940 was 6,044. Twelve radio stations operated from points within the state in 1941.

Banking and Finance.—State banks numbered 285 on June 30, 1941. Total assets were $89,360,630. There were also 50 building and loan associations with assets of $57,671,000; 11 industrial loan and investment companies with resources of $2,827,300 and 173 co-operative credit associations with assets of $3,370,675. National banks at the same date numbered 133 with resources of $311,271,000.

The total assessed value of the state in 1941 was $1,949,775,725. The tax rate for state purposes was set at 2.71 mills, which is calculated to produce $5,283,892. The biennial budget for 1941–43 carried appropriations of $60,909,869, of which $15,600,600 is from federal grants. There is no state tax on personal or corporate incomes, nor on sales. The state

Table I.—*Leading Agricultural Products of Nebraska, 1940 and 1939*

Crop	1940	1939
Corn	106,900,000 bu.	82,032,000 bu.
Wheat	34,821,000 bu.	34,376,000 bu.
Oats	35,700,000 bu.	20,576,000 bu.
Barley	22,544,000 bu.	14,651,000 bu.
Potatoes	11,340,000 bu.	9,720,000 bu.
Sugar beets	910,000 tons	790,000 tons
Hay	2,364,000 tons	2,463,000 tons

had no debt in 1941, though that of the local subdivisions amounted to $77,926,000. This does not include the debt of the public power and irrigation districts, amounting to somewhat more than $60,000,000.

Agriculture.—In 1940 the total acreage harvested was 15,309,000. Cash income was $278,468,000, divided as follows: Crops, $51,346,000; livestock, $180,826,000; government payments, $46,296,000. A large annual deficiency in rainfall during the period 1931–41 was reflected in a sharp decline in the cash income of producers. (*See* Table I on page 471.)

Manufacturing.—The value of all manufactured products in 1939 was $273,524,500. In that year 1,161 establishments employed 3,642 salaried persons and 18,810 wage earners and paid salaries and wages amounting to $28,135,500.

Table II.—*Principal Industries of Nebraska, 1939 and 1937*

Industry	Value of products	
	1939	1937
Meat packing	$117,713,576	$112,708,382
Creamery butter	21,133,891	23,291,846
Flour and mill products	17,485,317	25,524,100
Poultry dressing and packing	8,807,209	5,949,909

Mineral Production.—The state has no mineral wealth of consequence. Petroleum was discovered late in 1939 and by Aug. 1, 1941, 44 wells had produced 1,226,875 barrels. This, however, is not a significant portion of the national output. (L. W. L.)

Necrology: *see* OBITUARIES.

Negroes (American).

The war emergency called forth in 1941 increased pressures upon the federal government and its various agencies for remedial steps concerning racial discrimination, particularly in defense employment and in the armed forces. Considerably more progress had been made by the close of 1941 in the industrial field than in the military services, although some few gains in army policy materialized, principally in increased officer and officer-training quotas, in the commissioning of a few Negro field and coastal artillery units, and the authorization, after considerable Negro participation in the civil aeronautics program, of an air field and a limited air-corps training program (99th pursuit squadron) at Tuskegee. In industrial matters, nondiscrimination employment orders were promulgated covering the WPA defense projects, and a presidential order admonishing private industry similarly was followed by the appointment of a bi-racial federal "Fair Practices Employment Commission," authorized to investigate complaints relating to such discrimination by private concerns working on government defense orders. The presidential action was taken after the organization in June of a protest march on Washington under A. Philip Randolph, the Negro labour leader, which was called off in deference to the potential gains under the gradual enforcement of the order. Local protests also succeeded in some employment gains, in Washington, Chicago and especially in New York municipal and private transportation (subways and buses).

In civil rights, the U.S. supreme court reversed the unfavourable I.C.C. order refusing to compel railroads to provide accommodations of equal quality where separate transportation is in practice, a suit brought by Congressman Mitchell; the closed Democratic primary was again challenged (in process) in the U.S. circuit court in Texas; and following successful salary equalization proceedings in Delaware, Kentucky and Maryland, teacher salary campaigns were started in eight southern states practising such differentials. In Georgia, Governor Talmadge's dismissal of several officers of the state university for alleged advocacy of equal educational facilities for Negroes and whites provoked widespread protest from educational foundations and accrediting agencies. Suits for annulment of restrictive residential covenants in Philadelphia and Washington, D.C. were initially lost and appealed to higher courts. Adam C. Powell, Jr. was elected member of the New York City council.

Census figures indicated, as a result of adverse economic and social conditions, a fourfold more rapid decline of the rural Negro population, and the pressures of this forced and rapid urbanization loomed as a serious need for enlarged economic opportunity in industry and diversified employment. Negative symptoms of the situation began to appear in centres like Chicago and New York in the increase in relief and dependency figures as well as delinquency rates for Negroes.

Educational and Cultural.—The *Crisis* annual survey of education reported 4,964 college graduates out of a total of 39,993 college students. There were 310 masters and 11 doctoral degrees; 40 Rosenwald fellows in various fields of science, social science, art, music and education; a Guggenheim fellowship award to Richmond Barthe, the sculptor and the publication of notable books. (*See* BIBLIOGRAPHY.) A national network series (NBC) devoted to Negro participation in American life was successfully inaugurated under the supervision of Dr. Ambrose Caliver and under the auspices of the U.S. office of education, the Rosenwald fund and the Southern Education foundation. Marian Anderson received the $10,000 Bok award for outstanding achievement by a Philadelphian, and announced the gift as the nucleus of a foundation, recently incorporated, for the education of promising Negro singers and artists. Numerous exhibits of the works of Negro artists took place under the auspices of the American Federation of Arts, the Southside Community Art centre of Chicago and the Downtown Gallery of New York; and the Migration Series of Jacob Lawrence, a talented young artist, was featured in the November issue of *Fortune*. Richard Wright, whose novel *Native Son*, successfully dramatized by himself and Paul Green, was presented in New York and on the road by a mixed cast headed by Canada Lee, was chosen the 25th Spingarn medalist. A Negro extravaganza, *Cabin in the Sky*, starring Ethel Waters, was successful in New York and on continental tour. Wm. Grant Still's orchestral ballad, *Plain Chant for America*, to the libretto of Katharine Chapin, was inaugurated by the New York Philharmonic, and Dean Dixon, a talented young Negro conductor, rose to unusual recognition conducting the NBC orchestra, the Stadium Concerts' orchestra and the New York NYA orchestra in a series of concerts. The Southside Community Art centre, in Chicago, sponsored by a Negro Citizens' committee in co-operation with the Illinois Art project, was dedicated May 7 by Mrs. Eleanor Roosevelt.

Harvard university protested vigorously the athletic exclusion policy of the Naval academy, and voted to discontinue athletic relations with schools having such policies; later, Navy broke its custom for the first time in playing Cornell with Sam Pierce as member of the Cornell football team.

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Nelson, Donald Marr

(1888–), U.S. business executive, was born Nov. 17 at Hannibal, Mo. and was graduated from the University of Missouri in 1911. The next year he was employed by Sears, Roebuck and company as a chemical engineer. In 1927 he was appointed general merchandise manager of the company, in 1930 vice-president in charge of merchandising, and in 1939 executive vice-president and chairman of the executive committee. On May 29, 1940 Nelson was appointed full-time acting director of the U.S. treasury's procurement division. On June 28, 1940 he was named co-ordinator of national defense purchasing in co-operation with the advisory commission of the Council of National Defense. Four months later he became head of the commission's priorities division.

In the Office of Production Management (*q.v.*), created Jan. 7, 1941 by President Roosevelt, Nelson was appointed director of the division on purchases and thus assumed responsibility for buying billions of dollars of material for the defense program. On Aug. 28, 1941 he was named executive director of the Supply Priorities and Allocations board (*q.v.*) and priorities director of the OPM. Many persons, including Bernard Baruch, hailed the appointment and interpreted it as a step toward the long-awaited vesting of absolute authority for the defense program in one man.

The interpretation was correct. On Jan. 13, 1942 President Roosevelt announced that he would create a new War Production board to supplant the SPAB and would appoint Nelson chairman of the board, with supervision over all agencies of war production. The president's statement added that "his (Nelson's) decision as to questions of procurement and production will be final." Nelson thus received executive powers equivalent to those of Baruch in World War I. Immediately thereafter the Office of Production Management was abolished, and the powers and activities previously exercised by it were taken over by the War Production board.

Nepal. An independent kingdom (area *c.* 54,000 sq.mi., est. pop. 5,600,000) lying between India and Tibet—and including Mt. Everest—ruled in fact by the prime minister, Maharaja Sir Joodha Shumshere Jung Bahadur Rana. In 1941 no change took place in the personnel or methods of government. The prime minister and *de facto* ruler remained steadfast in his friendship for Britain, despite the wave of pessimism which followed the German successes in Europe. He confiscated all private wireless receiving sets in the country, on account of the effect on the public mind of the German broadcasts. The active assistance which the Nepal government gave to the British arms was substantial. It assented readily to its Gurkha regiments being sent overseas if necessary, and it raised several additional battalions for the Indian army, recruiting several times as many men as in ordinary years. The maharaja also contributed generously to various war funds and charities. The British envoy, Lt. Col. G. L. Betham, resides at the capital, Kathmandu (pop. *c.* 80,000).

(ME.)

Nernst, Walter (1864–1941), German physical chemist, was born June 25 at Briesen, West Prussia. Among his many inventions was the microscale which could indicate a weight of one-millionth of a milligram, and could detect the presence of gold in sea water. He died at his country estate near Muskan, Germany, Nov. 18. (See *Encyclopædia Britannica.*)

Nervous System. The selective service act found specialists in nervous and mental diseases prepared to assist in examining conscripts. Actually, the inadequate conditions under which they were permitted to work indicated no great progress since the selective service of World War I. Discussions and written articles among the large body of specialists revealed little advance in knowledge regarding war neuroses, their cause and treatment. Even the old terminology of neurocirculatory asthenia and effort syndrome was revived. However, Kardiner's study of chronic war neuroses with convulsive and vegetative symptoms showed that early and adequate treatment is essential for the prevention of permanent sequels. Among drafted men, psychiatric disorders stood only second to dental troubles as a cause of rejection from active service.

Experimental Neurosis.—Experimental neurosis in animals can be produced under specific conditions. Sheep, dogs and pigs develop neurotic behaviour when the tasks before them are too great for their individual discriminatory capabilities. The physiology of such states indicated that the chronic condition is perpetuated by an endocrine imbalance.

Vitamins.—Overenthusiasm regarding vitamin deficiency as it affects the nervous system has been replaced by sober knowledge. Vitamin E_1 (tocopherol) and B_6 (pantothenic acid) are ineffective therapeutically in degenerative diseases of the nervous system. Vitamin A causes nervous symptoms only by pressure of exuberant bone growth on the spinal cord and nerve roots. B_1 (thiamin) continues to be important in peripheral neuropathies.

Shock Therapy.—According to statistics, insulin shock therapy for schizophrenia is much less effective than the original anticipation. Electric shock superseded metrazol in the treatment of affective disorders (melancholia). Curare or magnesium sulphate used intravenously decreases the severity of the convulsions. Brain damage from the treatment consists largely in small haemorrhages and gangliac cell degenerations. Prefrontal lobotomy as a means of treating pathological anxieties was still in a controversial state. Profound mental deterioration, hemiplegic states and epilepsy are disastrous sequels. (*See* also PSYCHIATRY.)

Poliomyelitis.—The greatest advances made in the study of any single disease in 1941 occurred in poliomyelitis. The National Foundation for Infantile Paralysis, through generous subsidy of research workers, showed how adequate financial support of existing U.S. talent hastens the progress of knowledge. The epidemiology, portals of entry, methods of extension and immunological reactions of the virus of poliomyelitis were becoming clearer so that we might anticipate the discovery of preventive measures in the near future. (*See* also ENDOCRINOLOGY; INFANTILE PARALYSIS; MEDICINE; VITAMINS.)

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(R. R. G.)

Netherlands. A kingdom of northwest Europe, bounded N. by the North sea, E. by Germany, S. by Belgium and W. by the North sea; occupied by German armed forces in May 1940. National flag, red, white and blue, in equal horizontal stripes. Area 13,440 sq.mi.; pop. (est. April 1, 1941) 8,932,369. Chief towns (pop. Dec. 31, 1938): Amsterdam (cap. 793,526); Rotterdam (612,372); The Hague (prewar seat of the government, 495,518). Language: Dutch; religion: Christian (1930 census, Dutch Reformed Church, 2,732,333; Roman Catholic, 2,890,022). Ruler, Queen Wilhelmina; president of the council of ministers, Prof. P. S. Gerbrandy.

History.—Queen Wilhelmina and her cabinet continued their domicile in England during 1941. Early in the year Dr. E. N. van Kleffens, foreign minister, and Hr. Ch. J. I. M. Welter, minister for the colonies, on the way to the Netherlands East Indies, visited Secy. of State Cordell Hull in Washington. Discussions on the general situation and on internal affairs took place with the governor general of the Netherlands Indies. On Nov. 20 appointment was announced of Dr. H. J. van Mook, director general of the economic department of the Netherlands East Indies, and Hr. P. A. Kerstens, leader of the Roman Catholic party in the East Indies, as ministers respectively of colonies and of economics and shipping.

The royal Netherlands navy was active in the Allied cause, and the merchant marine was chartered to the British government. Dutch military forces organized in England received the name Royal Netherlands Brigade "Princess Irene."

On the occasion of her 61st birthday Queen Wilhelmina broadcast on Sept. 1 to Netherlanders throughout the world. In November an interesting ceremony took place in the Middlesex Guildhall, when members of the Dutch maritime high court were sworn into office, this being the first time that a foreign court of this nature had been established in England.

Immediately following the Japanese aggression in the Pacific in December the Netherlands was aligned with the Allied powers and declared war on Japan on Dec. 8, 1941. War was declared on Italy as from Dec. 11. (*See* also WORLD WAR II.) (H. F. D. B.)

In Occupied Holland.—Resistance of the Dutch people to the Germans increased during 1941 in the face of growing privations and accumulating terrors in the form of the Gestapo, concentration camps, forced labour, anti-Semitic laws and all the other familiar devices of German misrule. A sturdy campaign of opposition by the masses of the population provided many stories of

R.A.F. BOMBERS swooped so low over Dutch fields July 16, 1941 that their crews were able to wave to friendly farmers below

courage and ingenuity in weakening the morale of the invader, and open breaches occurred in February, when serious strikes and rioting followed repressive measures taken by the Germans after the killing of a Dutch nazi.

On July 28 it was reported that Dr. Hendrick Colijn, former premier, had been sent to a concentration camp with 60 other members of the dissolved antirevolutionary party. The banning of all national symbols, the nazification of the Dutch press, further anti-Semitic measures, stricter food and other commodity rationing, the completion of the economic incorporation of Dutch economy into that of the reich, and in July the dissolution of the leading political parties by the reich commissioner, Arthur Seyss-Inquart, were other manifestations of the "new order" in Holland. At the close of 1941, efforts were being engineered to set up a puppet government under the Dutch nazi leader, Mussert. (D. A. C.)

Education.—In 1938: elementary schools, 7,812; scholars, 1,242,778; secondary schools, 288; scholars, 62,301; high schools (1937–38), 4; scholars, 3,037; universities (1937–38), 6; scholars, 9,471.

Finance.—Revenue, ordinary (est. 1940), 741,100,000 florins; expenditure, ordinary (est. 1940), 746,500,000 florins; public debt (May 1940), 3,600,000,000 florins; notes in circulation (April 1940), 1,123,000,000; gold reserve (April 1940), 1,195,000,000 florins; exchange rate: (average 1938) 8.89 florins=£1 sterling; (July 31, 1939) 8.82 florins=£1 sterling; (average, April 1940) 6.66 florins=£1 sterling—approximately $4.03½, U.S.

Trade and Communication.—Trade (merchandise): imports (1938), 1,414,768,000 florins; (1939) 1,517,000,000 florins; exports (1938), 1,039,156,000 florins; (1939) 966,000,000 florins. Communication and transport, 1938: roads, suitable for motor traffic, 16,000 mi.; railways, open to traffic, 2,016 mi.; rivers and canals, navigable, 4,817 mi.; airways, distance flown, 6,629,000 mi.; shipping (June 30), 2,855,400 gross tons; launched (July 1938–June 1939), 246,400 gross tons; entered with cargoes, 27,606,524 net tons; cleared with cargoes, 23,151,428 net tons. Motor vehicles licensed (Aug. 1, 1938): cars, 94,000; buses, 4,088; trucks, 50,988; cycles, 55,140; wireless (June 30, 1939): registered receiving sets, 839,542; connections with radio-distributing systems, 368,710.

Agriculture, Manufactures, Mineral Production.—In metric tons (1939 actual figures): wheat, 416,523; rye, 603,532; barley, 146,041; oats, 449,241; pulse, 185,891; sugar beet, 1,716,052; flax, 152,487; cotton goods (1938), 136,565,000 guilders; machinery (1938), 99,821,000 guilders; coal, 12,861; salt, 199,800; iron ore (1938), 276,600; zinc, 20,500. (*See* also CURAÇAO; DUTCH EAST INDIES; NETHERLANDS COLONIAL EMPIRE; SURINAM.)

(H. F. D. B.)

Netherlands Colonial Empire.

Total area, excluding mother country, 789,700 sq.mi. (approx.); total pop. (est. Dec. 31, 1940), 70,154,000. The table lists the colonial possessions of the Netherlands, together with statistics appropriate to each.

History.—Although Japan did not specifically include the Netherlands East Indies in its war declarations of Dec. 7, 1941, the Dutch government in exile at London immediately declared war on the Japanese empire, "in view of Japan's aggression against two powers with whom the Netherlands maintain particularly close relations." The navy and air forces of the Netherlands East Indies took an aggressive part in the early stages of the Pacific war, and by the end of the year claimed the sinking of an average of one Japanese ship for each day of hostilities. (*See* WORLD WAR II.)

War found the Netherlands East Indies prepared. Since 1939 many developments of local industries had taken place and included the installation of an aluminum plant, a large hydroelectric plant, a scrap-iron plant and a rolling mill. The ship-repairing yards at Surabaya and Batavia, for both naval and merchant shipping, were improved and enlarged, and it was proposed to establish various new industries. Assembly plants for aircraft and factories for the local production of cement, glass and aluminum ware had been erected. In Semarang, Java, a shipbuilding company was formed under the auspices of Droogdok Maatschappij

Netherlands Colonial Empire

Territory and Area, sq. miles (approx.)		Population est. Dec. 31, 1938 (000's omitted)	Capital	Status	Governors
ASIA					
NETHERLANDS INDIES, including Java and Madura, Sumatra, Celebes, Borneo (D.), New Guinea (D.), Timor (D.), etc.	735,300	69,880 (est. Dec. 31, 1940)	Batavia	colony	*Governor-General:* Jonkheer Dr. A. W. L. Tjarda van Starkenborgh-Stachouwer.
AMERICA					
CURAÇAO	403	101	Willemstad	colony	*Governor:* G. J. J. Wouters.
SURINAM (Dutch Guiana)	54,000	173	Paramaribo	colony	*Governor:* Dr. J. C. Kielstra.

Tandjong Priok. Four slipways for 10,000-ton vessels were to be provided. (*See* also JAVA; SUMATRA.)

On Sept. 20, 1941, the Volksraad (people's council) had adopted the budget for 1942, amounting to 800,000,000 guilders, of which 530,400,000 guilders were to be for defense purposes. The population had contributed to the Spitfire fund up to Oct. 1 nearly 12,000,000 guilders, with which 86 fighters, 29 bombers, 3 night Beau fighters and 3 motor torpedo boats were bought. Up to early November the Netherlands East Indies contributed 4,000,000 guilders to the Van Galen fund for the purchase of a new destroyer as a birthday gift to Queen Wilhelmina, and undertook to raise 5,000,000 guilders of the 6,500,000 guilders necessary to pay for the destroyer.

Compulsory service of the native population was decreed during 1941, and affected some 600,000 natives annually. Naval units in the Netherlands East Indies were considerably strengthened. Anticipating the war, in July the Netherlands East Indies took action against Japan by suspending foreign exchange transactions, extending the system of special licences for all exports to Japan to include the Japanese empire, Manchoukuo, occupied China and French Indo-China, and prohibiting bank payments or deposits on behalf of Japanese nationals with special permits.

(H. F. D. B.; X.)

Neutrality. **Neutrality in Transition.**—Neutrality, in the technical sense of the position of states remaining aloof from war, underwent many changes and presented new problems during 1941. A number of states lost their neutrality by being invaded and forced to fight in defense of their national independence. Yugoslavia (*q.v.*) resisted the attempt of Germany to force it into collaboration with the axis and was overrun and conquered. Russia, having been technically neutral in spite of the pact of August 1939, was attacked by Germany on June 22 and entered the ranks of the belligerents. Finland (*q.v.*), having regained its status as a neutral in 1940, declared war on Russia on June 27 and became once more a belligerent. Bulgaria and Egypt continued technically neutral in spite of collaboration, the one with Germany and the other with Great Britain. Iraq and Persia continued neutral notwithstanding the occupation of their respective countries by British armies. Following the declaration of war upon them by Great Britain, Hungary, Rumania and Finland lost their status of formal neutrality.

Position of the United States.—The United States, without formally abandoning its status as a neutral toward Germany and Italy, continued and extended its policy of giving aid to the states resisting the axis powers. The legal justification given by the government for acts technically in violation of the obligations of neutrality was the necessity of self-defense against an international outlaw. This attitude was affirmed on numerous occasions, notably in addresses by the president on May 27, before the governing board of the Pan American union, and on October 27, navy and total defense day; and in an address by Secretary Hull on April 24 before the American Society of International Law. Germany, by openly repudiating the most fundamental rights of neutral states, could no longer claim the benefit of the observance of neutral duties by the other members of the community; and it was for them to decide upon the measures of defense to be taken against the menace to their own peace and safety. In an address at Havana on March 27, 1941, Attorney-General Jackson put forth the additional justification of the violation by Germany of the Kellogg-Briand pact.

With this justification of self defense, the United States broke freely with the traditional rules of neutrality. Statements announcing the necessity of "defense measures" were accompanied by denunciations of the German government which, taken apart from their justification, would have been in violation of the rule that a neutral government must not give expression to opinions unfavourable to either belligerent. The Roosevelt-Churchill statement on August 14 of "peace terms," known as the "Atlantic Charter," was thus a technically unneutral document, in that it was accompanied by a pledge from the United States to one belligerent to bring about the defeat of the other. Following the outbreak of war between the United States and Japan, President Roosevelt, in an address of Dec. 9, linked the other axis powers so closely to Japan as to eliminate the last vestiges of even formal neutrality.

The Lend-Lease Act.—The outstanding departure of the United States from the technical rules of neutrality, however, was the passage by congress on March 11 of the Lend-Lease act, by which the government itself contributed directly to the resources of one of the belligerents against the other. For, while under international law neutral citizens may sell arms to a belligerent and make loans, a neutral government must avoid strictly any such transactions. It was also a violation of neutral obligation for the United States to permit the repair of British warships in the ports of the United States, as well as to allow them to remain in port more than twenty-four hours.

Seizure of Belligerent Merchant Ships.—On March 30 the United States seized a number of merchant ships belonging to Germany and Italy and to countries occupied by Germany. The seizure in itself could be legally justified on the ground of the prevention of sabotage. An act of congress, approved June 6, authorized the acquisition by the United States of title to or the use of domestic or foreign merchant vessels for urgent needs of commerce and national defense. To the extent to which vessels thus owned by the United States were used to send materials to Great Britain there was a departure from technical neutrality.

Occupation of Iceland and Surinam.—On July 7 American naval forces occupied Iceland, the legal basis of the occupation being an agreement with the Danish minister in Washington, whose act could not in strict law be said to be the act of the government of Denmark under German occupation. Here again, self defense was regarded as overruling technical rules of neutrality. On Nov. 23, acting with the consent of the *de jure* government of Holland in London, and in accordance with the provisions of the act of Havana of 1940, the U.S. occupied Surinam (Dutch Guiana) ostensibly for the protection of the bauxite mines. (*See* also GREENLAND.)

Resistance to Submarine Attacks.—Beginning with the case of the "Robin Moor" on May 21, a number of vessels flying the American flag were sunk by German submarines in open violation of the laws of war, no notice of visit and search being given and no adequate provision made for the safety of the passengers and crew. The state department, after protesting the sinking of the "Robin Moor," subsequently proposed liquidation of the case by the payment by Germany of an indemnity for the destruction of the vessel. Following the sinking of the "Sessa," President Roosevelt announced Sept. 11 that American warships had been ordered to attack enemy submarines at sight. The legal ground for this order is the right of the neutral state to defend itself against acts of piracy, in accordance with the terms of the Washington treaty of 1922. In spite of the attack by a German submarine upon the United States destroyer, "Kearny," and the sinking of the destroyer "Reuben James," both the United States and Germany refrained from considering the hostilities as technical "war."

On October 17 the house of representatives voted to repeal sec. 6 of the Neutrality act of 1939, by which it was forbidden to arm American merchant ships. On Nov. 7 the senate amended the house bill by repealing, in addition to sec. 6, secs. 2 and 3 by which American vessels were forbidden to carry passengers or materials to the belligerents or to proceed into or through waters designated as combat areas. These amendments were voted by the house on Nov. 13, and the repeal bill became law on Nov. 17. Inasmuch as the provisions of the Neutrality act were in excess of the obligations of international law, the repeal measure did not of itself alter the neutral status of the United States. The carriage of contraband to a belligerent port is not of itself a violation of international law; it merely subjects the vessel engaged in the traffic to the penalty of capture and confiscation, after proper visit and search. To attack such vessels without warning and without making provision for the safety of the passengers and crew would be an act of piracy on the part of Germany and justify the most extreme measures of self defense.

Inter-American Neutrality.—The Inter-American Neutrality committee continued in session at Rio de Janeiro, its most important recommendation, made at the request of the Havana meeting of foreign ministers in July, 1940, being one in favour of the extension of territorial waters to a distance of 12 miles. A dissenting opinion to this proposal was entered by one of the members on the ground that it involved established fishing rights belonging to other nations and that as a neutrality measure it was in derogation of the wider "security zone" already approved.

On June 21 the government of Uruguay proposed that the American republics should adopt a policy of not treating as a belligerent any American country which in defense of its own rights should find itself in a state of war with nations of other continents. The proposal was based upon the principle of continental solidarity, that any act susceptible of affecting adversely the rights of any one of the American countries should be regarded as an offense against all of them. On July 1 the United States replied, supporting the initiative of the Uruguayan government and restating the policy of the United States, in accordance with which the security of each of the American republics is regarded as dependent upon the security of all and aid is to be given to countries resisting the forces of aggression (department of state *Bulletin*, July 5). Upon the outbreak of war between the United States and Japan, Argentina and other American countries declared that, in accordance with the principle of continental solidarity, they would not treat the United States as a belligerent. (*See* also INTERNATIONAL LAW; LEAGUE OF NATIONS; PROPAGANDA.)

(C. G. FK.)

Nevada. The smallest of the U.S. mountain states, Nevada was admitted to the union Oct. 31, 1864. It has two popular names, the "sagebrush state" and the "Silver state." Total area, 110,540 sq.mi.; pop. (1940) 110,247. Of the population, 39·3% were urban; 93,431 were native white, 10,599 were foreign-born white, 664 were Negro and 5,553 were of other races. Capital, Carson City (2,478); other cities are: Reno (21,317); Las Vegas (8,422); Sparks (5,318); Ely (4,140); Elko (4,094); Winnemucca (2,485); and Fallon (1,911).

History.—The 40th session of the state legislature was held early in 1941 and accomplished little of importance. Adherence to the previous policies of freedom from all so-called nuisance

taxes and a continuance of the sound business principles that had given Nevada a balanced budget and large treasury surplus were noted. A driver's licence law was approved.

Political activity was not noticeable. The appointment by Governor Carville of a director of the state council of defense resulted in Nevada's having an efficient operating council months in advance of U.S. entry into the war. The council was financed by an emergency appropriation of $10,000 passed by the legislature.

The principal state officials were: governor, E. P. Carville; lieutenant governor, Maurice J. Sullivan; secretary of state, Malcolm McEashin; attorney general, Gray Mashburn; state treasurer, Dan W. Franks; state controller, Henry C. Schmidt; superintendent of public instruction, Mildred Bray; U.S. senators, Pat McCarran and Berkeley L. Bunker. Chief justice of the state supreme court was Edward A. Ducker.

Education.—In 1940–41 there were 240 elementary schools, with a total enrolment of 14,853 pupils, staffed by 669 teachers. In 1941 there were 40 high schools, with a total enrolment of 5,911 pupils, staffed by 259 teachers. In 1941 the total school enrolment was 21,695; and $2,894,156.40 was spent for education. The University of Nevada during 1940–41 had a total net enrolment of 1,382 and 121 members on the faculty.

Public Welfare, Charities, Correction.—The amount spent for public assistance for the fiscal year ending June 30, 1941, was $27,000; for social security and old-age assistance, $771,975.36. On Jan. 1, 1942, the state prison had 244 inmates; total expenditures for the year ending June 30, 1941, were $98,471.82; the State Industrial home had 40 inmates, expenditures, $20,343.25; the State Hospital for Mental Diseases had 359 patients, expenditures, $106,748.36; the orphans' home had 53 inmates, expenditures, $39,201.62.

Communication.—On Jan. 1, 1942 there were 5,521 mi. of roads in the state-designated highway system, 2,780 mi. of oil or paved surface roads and 3,067 mi. of improved roads. During 1941, 215 mi. of road were constructed and surfaced. Expenditures were $4,508,973.58 for the fiscal year ending June 30, 1941. On Jan. 1, 1942, there were 418.40 mi. of short-line railroads and 1,475.40 mi. of trackage on the three transcontinental railroads in the state. On Jan. 1, 1942, there were six standard airports and 26 secondary airports in Nevada.

Banking and Finance.—On Jan. 1, 1942, there were six state banks with deposits, as of Sept. 24, 1941, of $4,005,636.56. On Jan. 1, 1942, there were seven national banks, one of which, the First National Bank of Nevada, had 10 branches throughout the state. These banks had total deposits, as of June 30, 1941, of $41,153,000, and total resources of $44,712,000. On Jan. 1, 1942, there were three savings and loan associations with resources of $305,575.75.

State receipts for the fiscal year 1940–41 were $9,647,112.52; disbursements, $9,684,065.23. The state gross and net debt was as follows, June 30, 1941: state investment, $3,488,652.18; bonded debt, $542,000; net investment, $2,946,652.18.

Agriculture.—The total value of agricultural production in 1940 was $12,132,935, and the total acreage harvested was 451,688.

The cash income from crops and livestock was $15,334,158. During 1941, livestock and agriculture enjoyed a good season with plentiful rains and no droughts.

Table I.—*Leading Agricultural Products of Nevada, 1940 and 1929-38 Average*

Crop and unit of production	1940	Average 1929-38
Corn, bu.	120,000	50,000
Oats, bu.	280,000	115,000
Wheat (all), bu.	483,000	382,000
Barley, bu.	540,000	260,000
Hay (all), tons	534,000	485,000
Potatoes, bu.	391,000	384,000
Pears, bu.	3,000	4,000
Peaches, bu.	5,000	5,000
Grapes, tons	110	94

Manufacturing.—The total value of manufactures, according to the 1939 U.S. biennial census, was $20,581,713. The average number of employees in manufacturing was 1,093, and the total wages paid $1,642,397. The number of manufacturing establishments in Nevada in 1941 was 105, and the leading manufactures were iron and steel products, automobile parts, printing products, lumber products, brick and clay products.

Mineral Production.—The total value of gold, silver, copper, lead and zinc production in 1940 was $37,089,777; production of miscellaneous minerals, as of 1938, was $3,501,801. The production of all the strategic metals was greatly increased in 1941; tungsten, mercury, manganese, vanadium and antimony showed a substantial increase, and the same activity was noted in the nonmetallic field. Nevada produced a large tonnage of magnesite and brucite. The state ranked first in the United States in the production of turquoise. (E. C. D. M.)

Table II.—*Principal Mineral Products of Nevada, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Gold	$13,437,655	$12,653,130
Silver	3,080,060	2,929,068
Copper	17,730,604	13,852,176
Lead	749,000	398,184
Zinc	1,490,958	647,712

Nevinson, Henry Woodd (1856–1941), British foreign correspondent and author, was born in Leicester and attended Shrewsbury school and Christ Church, Oxford. He began his career as a war correspondent in an era when reporters generally were eyewitnesses at battles, and he covered nearly every major conflict from the Graeco-Turkish War of 1879 to World War I. He escaped capture on several occasions and was wounded during the Dardanelles campaign of World War I. He also covered a number of postwar parleys for the *Manchester Guardian*. Among his works are *A Modern Slavery* and *The Dawn in Russia* (1906), *The New Spirit in India* (1908), *The Dardanelles Campaign* (1918), *Between the Wars* (1936) and *Films of Time* (1938). Nevinson died in Chipping-Campden, Gloucestershire, Nov. 9.

Newbery Medal: *see* AMERICAN LIBRARY ASSOCIATION.

New Brunswick. One of the four provinces which united to form the dominion of Canada (*q.v.*) in 1867; area 27,985 sq.mi.; population, 1941, 453,377, of whom 97% were native-born and 36% were urban. Capital, Fredericton (9,905). Other cities are St. John (50,084) and Moncton (22,411). The lieutenant governor in 1941 was W. G. Clark and the premier was J. B. McNair.

Education.—The enrolment in 1941 in the public schools was 96,953; in private schools, 2,958. The number of teachers was 2,767. The state university in Fredericton had an enrolment of 404 students, with 24 instructors. Mount Allison university in Sackville had 425 students and 54 instructors.

Communication.—Surfaced highways had a mileage of 7,772 in 1941; earth highways, 4,278. The cost in 1940 was $8,304,588. The railroad mileage was 1,873 in 1941; the number of telephones, 33,872.

Finance.—Government receipts for the fiscal year 1939–40 were $12,459,611; expenditure, $11,921,467; gross debt $103,568,573; net debt $92,263,340.

Agriculture.—Acreage under cultivation in 1941 was 908,000; the value of agricultural products was $32,076,000, with a cash income of $26,632,000.

Table I.—*Leading Agricultural Products of New Brunswick, 1941 and 1940*

Crop	1941	1940
Oats, bu.	6,507,000	6,671,000
Potatoes, cwt.	6,896,000	5,039,000
Turnips, cwt.	3,340,000	2,772,000
Hay and clover, tons	944,000	931,000

Manufacturing.—The total estimated value of manufactures in 1939 was $66,058,151; the number of wage earners was 14,501; wages paid, $13,659,162.

Table II.—*Principal Industries of New Brunswick, 1938 and 1937*

Industry	Value of products	
	1938	1937
Pulp and paper	$14,297,334	$20,195,064
Sawmills	5,414,051	7,585,133
Coffee, tea and spices	3,464,593	3,580,214
Fish packing	2,557,617	3,115,280

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New Caledonia: *see* FRENCH COLONIAL EMPIRE.

New Deal: *see* BUDGETS, NATIONAL; UNITED STATES: *History*.

Newfoundland and Labrador. Area: Newfoundland 42,000 sq.mi.; Labrador 110,000 sq.mi.; total 152,000 sq.mi.; pop. (est. Dec. 31, 1938): Newfoundland, 290,660; Labrador, 4,780. Chief town (capital, pop. 1941): St. John's (39,886). Governor: Sir Humphrey Walwyn; language: English; religion (1935 census):

Roman Catholic, 93,925; Church of England, 92,732; United Church, 76,100; Salvation Army, 18,054.

History.—During 1941 Newfoundland, proportionately to its population, made a larger contribution in manpower to the Allied war effort than did any other part of the empire. It continued to be administered by the commission of government, on which H. A. Winter succeeded his brother, J. A. Winter, who had been appointed chief clerk and registrar of the supreme court, and P. D. H. Dunn succeeded J. H. Garvin.

Newfoundland relinquished its annual grant-in-aid from the imperial government, imposed extra taxation and inaugurated a war-savings campaign; the budget for 1940–41 for the first time in many years showed a surplus, with revenue at $16,200,000 and expenditure at $15,500,000—a result to which increased imports, employment on the U.S. and Canadian bases and remittances from those working overseas as lumbermen and in the armed forces contributed. Economic conditions also improved, as was exemplified by the opening in March of a new $4,000,000 sulphite plant built for the Bowater paper mills for an annual output of 30,000 tons. Of the budget surplus, $500,000 went to provide a Newfoundland fighter squadron for imperial use, and $2,300,000 of the estimated 1941–42 surplus of $2,600,000 was earmarked as an interest-free loan to Britain.

The granting of the lease of a naval base to the U.S. met with some opposition, but this was at once allayed by a letter from Prime Minister Churchill stressing the advantages to be gained by such U.S. aid, and the base at Quidividi lake was constructed. Other effects of the war were the emigration of numbers of young men to Canada for R.A.F. training under the empire scheme, and the revocation of the exequatur of the Vichy French consul at St. John's. (L. H. D.)

Education.—In 1940: schools, 1,898; scholars on rolls, 66,508; average attendance, 70.2%.

Banking and Finance.—Revenue, ordinary: 1940–41 (actual), $16,187,505; 1941–42 (est.), $17,463,295; expenditure: 1940–41 (actual), $15,490,974; 1941–42 (est.) $14,865,475, including $1,232,267 for special reconstruction work; public debt (June 30, 1939), sterling £20,382,869; notes in circulation (June 30, 1939), $24,023; exchange rate same as Canadian dollar.

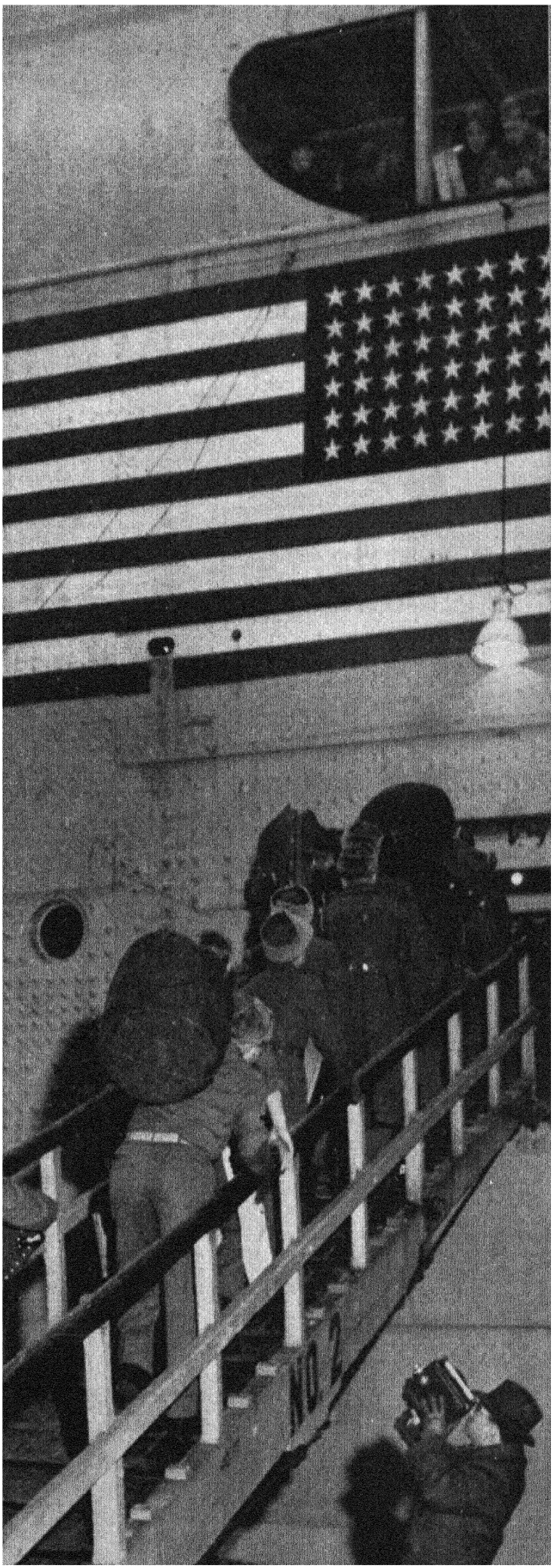
Trade and Communication.—Overseas trade 1939–40 (merchandise): imports, $28,421,897; exports, $32,827,323. Communications (Dec. 31, 1938): roads, main, 1,150 mi.; secondary and local, 6,000 mi.; railways, open to traffic, 747 mi.; motor vehicles licensed (1940): cars, 4,429; trucks and buses, 1,340; cycles, 154; telephones (1940), 10,588.

Mineral Production and Fisheries.—Fisheries (1940): cod (inshore, deep sea and Labrador), 87,549 metric tons; seal, $205,030; salmon (export), 3,750,336 lb.; lobster (export), 2,477,289 lb.; fish oils (export), 1,826,377 lb. In metric tons (1938): wood pulp, 242,000; iron ore (metal content), 887,000; lead ore (metal content), 24,300; silver, 44.0; gold, 754 kg.

New Guinea: *see* DUTCH EAST INDIES; MANDATES; PACIFIC ISLANDS, MANDATED.

New Hampshire. One of the New England group of states and one of the original states of the United States, popularly known as the "Granite state." Total area, 9,304 sq.mi.; pop. (1940), 491,524. Of this population, 283,225 or 57.6% were urban. In 1930 there were 464,350 whites, of whom 381,690 were native born and 82,660 foreign born. Capital, Concord (27,171). Other cities are Manchester (77,685), Nashua (32,927), Berlin (19,084), Dover (14,990) and Portsmouth (14,821).

History.—The general court met in its 163rd session from Jan. 1 to June 13, 1941. Important legislation included an act setting up a state council of defense, with advisory and local committees; an antisabotage act; a law for regulating the sale and handling



THE FIRST CONTINGENT of U.S. troops bound for duty at the leased base in Newfoundland sailed from New York city Jan. 15, 1941. They were the first U.S. soldiers to leave for service on foreign soil. The flag on the ship's side is correctly displayed, in accordance with the U.S. Maritime Commission's ruling that flags painted on the starboard side of ships should have their stripes flowing back, as if flying in the wind

of explosives; an act establishing a state guard regiment for local military defense in the absence of the federalized national guard; a capital budget act carrying an appropriation of $216,000 for new construction and permanent improvements to state buildings; and an act abolishing the 2% capital stock tax on domestic insurance firms. The state constitutional convention which had met in 1938 was reconvened Sept. 23, 1941, to consider reduction of membership in the house of representatives, which stood at the high figure of 423. A proposal was adopted designed to effect a reduction of approximately 60 seats, which was to be submitted to the voters at the state election of 1942.

State officers in 1941 were: governor, Robert O. Blood (elected in Nov. 1940); secretary of state, Enoch D. Fuller; state treasurer, F. Gordon Kimball; adjutant general, Charles F. Bowen; attorney general, Frank R. Kenison (all Republican). U.S. senators from New Hampshire were H. Styles Bridges and Charles W. Tobey (both Republican).

Education.—There were, in 1938, 1,810 public elementary schools, with an enrolment of 50,173 pupils and 2,120 teachers. There were 89 public high schools, with 20,304 pupils and 837 teachers. Total state expenditures for public education, in the year ending June 30, 1939, $8,547,642. Private schools had an enrolment of 28,136 pupils, of whom at least 20,000 were in elementary parochial schools in 1938.

The University of New Hampshire, at Durham, had an enrolment of 2,013 at its regular session (1939) with a teaching staff of 153. The New Hampshire State Normal school at Keene had 338 students enrolled, and a staff of 33, while the Normal school at Plymouth had 193 students and a staff of 29.

Public Welfare, Charities, Correction.—The burden on the state for direct relief decreased steadily after April 1940. There were 26,973 persons on direct relief in March 1941; the cost of direct relief in the same month, $217,222. Employees in 1938 under the old-age insurance plan, 144,916, with taxable wages of $100,033,000. Unemployment compensation benefit payments in 1939 amounted to $1,553,000, with a total of 357 claims. Public assistance under federal works program in June 1940 was $1,458,000. On Jan. 1, 1938, there were 262 persons in prisons and reformatories in New Hampshire. The 1941 appropriation for the state prison at Concord was $126,540; and for the Industrial School for Committed Minors, at Manchester, $91,600.

Communication.—Rural highways and urban extensions amounted in 1938 to 3,584 mi. Disbursements in 1939 for highways, including federal-aid funds, $8,815,000. In 1938 there were 1,013 mi. of steam railroads in the state.

Banking and Finance.—As of Dec. 30, 1939, there were in New Hampshire 52 national banks, with deposits of $74,032,000 and resources of $88,853,000; and 55 other than national banks, with deposits of $209,675,000 and resources of $235,333,000. Forty-three savings banks and eight savings departments of trust companies reported deposits of $207,095,202 as of June 30, 1941, representing an increase over June 30, 1940, of $1,515,722. There were in 1941, 26 building and loan associations with resources of $13,112,451.59, an increase of $568,884 over the preceding year.

Cash receipts of the state treasury department for the fiscal year ending June 30, 1940, $39,575,339.71; cash disbursements, $39,111,037.32; cash balance, $1,244,916.50. Gross fixed bond and note debt, June 29, 1940, $10,292,000; total net bonded debt and temporary loans, $10,627,438.97.

Agriculture.—The total value of farm products sold, traded or used by farm households, 1939, was $22,939,158, as compared with $28,583,645 for 1929. Total acreage crop-land harvested (1939), 371,611. Income (1939) from livestock and livestock products, $15,148,055. Farm products used by farm households, $3,579,343. Estimated payments to New Hampshire in 1940 under the Agricultural conservation program, $417,514. New Hampshire agriculture faced serious difficulties in 1941, owing to prolonged drought and a shortage of farm labour, occasioned in part by the demands of defense industries.

Table I.—*Leading Agricultural Products of New Hampshire, 1941 and 1940*

Product	1941	1940
Corn (grain and silage), bu.	615,000	600,000
Oats, bu.	259,000	280,000
Potatoes, bu.	1,472,000	1,634,000
Apples, bu.	764,000	925,000
Hay (tame and wild), tons	371,000	435,000
Maple sugar, lb.	26,000	72,000
Maple syrup, gal.	58,000	83,000
Milk, lb.	353,720,000	355,200,000

Manufacturing.—Total estimated value of manufactures (1939), $237,396,015. Salaried personnel, 4,593; salaries, $10,483,983. Wage earners, 55,781; wages paid, $52,735,240.

Table II.—*Principal Industries of New Hampshire, 1939*

Industry	Value	Industry	Value
Boot and shoe cut stock and findings	$12,709,283	Paper and paperboard mills	$16,293,358
Cotton broad woven goods	20,267,109	Woollen and worsted	25,881,985
Footwear (except rubber)	63,464,629	Paper and allied products	17,095,136
		Machinery	8,150,154

Table III.—*Principal Mineral Products of New Hampshire, 1939 and 1938*

Mineral	Value, 1939	Value, 1938	Mineral	Value, 1939	Value, 1938
Clay products	$321,751	$278,206	Sand and gravel	$219,296	$243,040
Feldspar	161,968	135,760	Stone	437,342	444,537
Mica	5,330	(unavailable)			

Mineral Production.—The total value of minerals produced in 1939 was $1,187,339. In 1940, under the direction of the State Planning and Development commission, a mineral resources survey was made, the results of which were published by the commission. Mica production declined during the decade 1931–41, because of low prices and foreign competition.

(W. E. Ss.)

New Hebrides: *see* PACIFIC ISLANDS, BRITISH; FRENCH COLONIAL EMPIRE.

New Jersey. One of the original states of the United States; known as the "Garden state." Area, 7,836 sq.mi.; pop. (1940) 4,160,165; capital, Trenton (124,697). Other cities include Newark (429,760); Jersey City (301,173); Paterson (139,656); Camden (117,536) and Elizabeth (109,912).

History.—While only legislative and local offices were filled in 1941, New Jersey's "off year" was not without notable political developments. Conspicuous was the break between Governor Charles Edison, formerly secretary of the navy in President Roosevelt's cabinet, and Mayor Frank Hague of Jersey City, the Democratic state leader and vice-chairman of the Democratic National committee. Mayor Hague had supported Edison in the 1940 election. The governor had been in office less than a month when he asserted his independence of the Hague organization. He made appointments and decided on policies without consulting the party leader.

The evident coolness culminated in a break in midsummer when Governor Edison appeared before the Republican legislature in joint session and urged the adoption of the railroad tax bills. This legislation provided for a new method of assessing and taxing railroad property. It had been bitterly opposed by Mayor Hague in a series of newspaper advertisements, and was the climax of a ten-year court fight by the roads to change taxing methods theretofore in vogue. Mayor Hague contended the legislation favoured the railroads unduly, and that Jersey City would be deprived of millions of dollars in revenue.

Governor Edison acted upon the recommendations of a fact-finding committee which he appointed to resolve the long-standing controversy. The governor contended the proposed system was equitable and that in prosperous years the state would reap larger returns than ever. The new laws did not end the litigation. Attorney General David T. Wilentz, supporting Mayor Hague, attacked the constitutionality of the laws in the court of chancery. The state treasurer, William Albright, was authorized by the legislature to engage outside counsel to defend its action. Meantime, Mayor Hague announced his intention to turn the party leadership over to Governor Edison.

Prior to this development, Governor Edison had come out for a constitutional convention to overhaul New Jersey's charter adopted in 1844. Reorganization of the state courts was also proposed by the governor, who advocated two-year instead of one-year terms for assemblymen; four-year instead of three-year terms for senators, and a four-year term instead of a three-year term for the governor. He also urged extension of executive authority, with respect to appointments and vetoes.

Insisting that he was not seeking personal aggrandizement, Governor Edison stipulated that the constitutional changes not become effective until his administration had terminated. The Republican legislature refused to accede. Thereafter Edison began a campaign to elect a Democratic assembly and to gain senate seats. He appeared in almost every county. The Hague organization remained aloof from the state fight, concentrating on the pro-

duction of a huge "protest vote" in Hudson county against the railroad laws. The Hague candidates were elected overwhelmingly, and the Republicans retained control of the legislature by increased majorities in both houses. The 1942 house stood Republican by 43 to 17, the senate, Republican by 17 to 4.

Apart from the accord on the railroad issue, the year was one of conflict between the governor and the legislature. The dispute had its origin in the refusal of the senate to confirm some of Edison's key appointees, including William L. Dill as state highway commissioner and General Richard Williams, a retired marine, as superintendent of state police. E. Donald Sterner, a Republican, continued in the former office. General Williams was subsequently named as Edison's secretary for defense, a position for which senate confirmation was not necessary. Major Charles Schoeffel, a state police veteran, later was named superintendent.

On Dec. 22 the legislature revived a law enacted in 1918. It gave the governor wide powers to call upon the resources and personnel of the state in a war emergency. Under it the governor formed a war cabinet to expedite civilian defense measures and to extend the work of the State defense council. As another defense measure, a state guard consisting of approximately 2,000 was equipped to replace the national guard.

Education.—There were 785,195 pupils enrolled in the elementary and secondary schools of New Jersey in 1939–40; teachers, numbering 28,640, were paid an average salary of $2,100. In 1938, pupils enrolled in private and parochial schools, except kindergartens, numbered 127,266. The 30 institutions of higher education in the state had a total enrolment of 19,706. State expenditures for elementary and secondary schools in 1939–40 were $111,736,671.

Public Welfare, Charities, Correction.—In June 1940 there were 48,138 persons receiving relief in New Jersey, as compared with 61,900 in June 1939. Federal grants to New Jersey for public assistance in 1939–40 totalled $8,229,896, divided as follows: old age, $3,832,457; dependent children, $1,547,192; blind, $99,311; unemployment compensation and state employment services, $2,723,936. There were 3,457 prisoners in state and federal prisons and reformatories in New Jersey in 1938.

Communication.—On Jan. 1, 1939 there were 1,235 mi. of primary-system rural state highways in New Jersey—all surfaced—and 1,593 mi. of rural roads and urban extensions. Disbursements on state highways, including federal-aid funds, were $48,330,000 in 1939. There were 2,132 mi. of steam railways in the state in 1938. In 1937 there were 698,782 telephones.

Finance.—The net value of real and personal property, subject to taxation in 1940 was $5,489,669,439, a decrease from 1939 of $129,134,237. These ratables were made up as follows: real estate, exclusive of second-class railroad property, $4,652,595,551; second-class railroad property, $177,594,315; personal property, exclusive of bank stock, $727,316,142. The average tax rate for 1940 was $4.718 per $100 of valuation. Real estate and personal property specifically exempted from taxation in 1940 amounted to $1,103,937,844, comprising mainly schools, churches, cemeteries, public and charitable properties.

Agriculture.—Farm income for 1940 was $105,870,000, an increase of $5,278,000 over 1939. The number of farms totalled 25,835, with a land area of 4,814,070 acres. New Jersey farms were valued at $227,805,686, according to the United States census bureau. Total farm population in New Jersey in 1940 was 146,459.

Table I.—*Leading Agricultural Products of New Jersey, 1941 and 1940*

Crop	1941	1940
Wheat, bu.	1,232,000	1,316,000
Corn, bu.	7,869,000	7,371,000
Oats, bu.	1,485,000	1,419,000
Barley, bu.	196,000	196,000
Potatoes, bu.	9,790,000	10,150,000
Apples, bu.	3,150,000	3,926,000
Tame hay, tons	340,000	367,000

Manufacturing.—New Jersey was among the leading states in the production of war matériel in 1941. As of Nov. 1941, armament contracts of all descriptions aggregated $1,937,305,000. The per capita defense expenditure amounted to $465.67, largest in the U.S.A. Employment in manufacturing plants increased in 1941 by 27.8%; weekly pay rolls rose 46.3%. Average weekly earnings for full-time and part-time employees rose from $28.86 in 1940 to $35.72 in 1941. Average hourly earnings were 83.6 cents, and average hours worked a week totalled 42.9.

Mineral Production.—The total value of minerals produced in New Jersey in 1939 was $30,271,293, as compared with $24,408,545 in 1938.

Table II.—*Principal Mineral Products of New Jersey, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Zinc	$11,507,318	$10,891,683
Clay	6,726,041	5,210,105
Sand and gravel	3,301,055	2,519,575
Stone	3,036,516	2,678,766

(W. R. Ck.)

Newlon, Jesse Homer (1882–1941), U.S. educator, was born July 16 in Salem, Ind. He received his LL.D. degree from the University of Denver (Colo.) in 1922. While superintendent of the Denver public schools, 1920–27, Newlon instituted curriculum changes which became the basis for educational revisions throughout the United States. He preached academic freedom, stressed the need for changing social ideas in education and advocated the participation of educators in government. He was president of the National Education association, 1924–25, and in 1925 was awarded the Butler medal from Columbia university. He was director of the Lincoln Experimental School of Teachers college at Columbia university, 1927–37, and in 1938 became director of the college's division of the foundations of education. He was the author of *Education Administration as Social Policy* (1934) and *Education for Democracy in Our Time* (1939). He died at New Hope, Pa., Sept. 1.

New Mexico. Fourth largest state in the southwestern United States, popularly known as the "Sunshine state"; admitted to the union in 1912. Total area, 121,666 sq.mi.; pop. (1940) 531,818 (25.6% increase since 1930), divided among rural, 355,417; urban, 176,401 (33.2%); native white, 477,065; Negro, 4,672; foreign born, 15,247. Capital, Santa Fe (20,325). Other cities include Albuquerque (35,449); Roswell (13,482); Hobbs (10,619); Clovis (10,065).

History.—The administration, legislature and congressional representation were Democratic in 1941. The chief officers of the state in 1941, elected for two years, were: governor, John E. Miles; lieutenant governor, Ceferino Quintana; secretary of state, (Mrs.) Jessie M. Gonzales; auditor, E. D. Trujillo; treasurer, Rex French; attorney general, Edward P. Chase; superintendent of public instruction (Mrs.) Grace J. Corrigan; commissioner of public lands, H. R. Rodgers. U.S. senators were Carl A. Hatch and Dennis Chavez.

Legislation of 1941 provided for airport zoning regulation, prohibition of liquor sales near army posts, permissive municipal slum clearance, the teaching of Spanish in the 5th to 8th grades under certain conditions, a public service commission, a board of examiners in the basic sciences for practising the healing art and a state guard. The State Merit System commission and Legislative Reference bureau were abolished. A special appropriation of $750,000 was made for national defense to be expended by the state finance board.

Education.—For the school year 1939–1940, 907 rural schools, with 62,669 pupils and 1,900 teachers, cost $4,447,061.60; 236 municipal schools, with 69,920 pupils and 1,898 teachers, cost $5,995,034.59. The University of New Mexico had a faculty of 118, a student enrolment of 1,505; New Mexico Highlands (formerly Normal) university, 37 and 338; State Teacher's college, 51 and 199; Eastern New Mexico college, 36 and 458.

Public Welfare, Charities, Correction.—For the fiscal year ending June 30, 1941, the WPA spent $11,044,573.76 for labour and material, and NYA spent $354,520.82. During the calendar year 1941, $778,750 was paid out for unemployment benefits; in old-age assistance, approximately 4,870 beneficiaries received about $17.02 per month, total $989,437.23; approximately 5,872 dependent children received about $9.16 per month, total $652,372.98; approximately 225 needy blind received about $18.62, total $50,110.17; and $147,157.25 was expended for general assistance.

The penitentiary appropriation was $130,480 for 667 inmates (Sept. 1, 1941), including 76 on the prison farm; Insane Asylum, $227,280, 913 inmates; School for Mental Defectives, $47,480, average daily population 79.58 (1940); Industrial school, $39,000, 119 inmates (Nov. 1941); Girls' Welfare home, $62,000, 100 inmates (Nov. 1941).

Communication.—New Mexico had an estimated 61,500 mi. of roads in 1941; 9,276 mi. constituted the state highway system. For the fiscal year ending June 30, 1941, the state highway department expended $8,702,367.45. Steam railway companies operated 2,812 mi. of main track (1940). There were 45 airports, and approximately 1,302 mi. of airways operated by three scheduled air carriers in 1941. There were about 41,000 telephones.

Banking and Finance.—On June 30, 1941, there were 22 national banks with deposits of $51,583,000; loans, $20,916,000; investments, $16,470,000; and 19 state banks with deposits of $14,767,000; loans, $6,542,000; investments, $3,250,000. Total resources of 12 building and loan associations in 1940 were $4,166,208.38 and of 7 federal savings and loan associations, $2,448,889.90. Total of all state receipts for the fiscal year end-

ing June 30, 1941, were $28,923,630.91; expenditures, $30,018,531.93. The gross and net debt were respectively $24,331,500 and $24,009,569.79.

Agriculture.—The total value of agricultural production in 1941 was estimated at $38,626,000; acreage harvested, 1,548,300. Unusual rainfall caused an estimated loss of $1,299,180, principally in the Pecos valley.

Table I.—*Leading Agricultural Products of New Mexico, 1941 and 1940*

Crop	1941	1940
Grain sorghums, bu.	8,348,000	3,150,000
Wheat, bu.	2,735,000	1,720,000
Corn, bu.	3,315,000	2,376,000
Beans, bags	1,078,000	656,000
Cotton, bales	115,000	123,000

Manufacturing.—Manufactured products were valued at $25,123,641 in 1939; an average of 3,250 employees received $2,912,993 in wages.

Table II.—*Principal Industries of New Mexico, 1939 and 1937*

Industry	Value of products	
	1939	1937
Petroleum refining	$3,538,753	$3,431,417
Lumber and timber	2,757,424	4,945,151
Bakery products	1,756,121	1,666,226
Newspapers	1,456,759	1,211,859
Nonalcoholic beverages	1,208,823	870,213
Cottonseed oil, etc.	1,164,676	1,436,751

Mineral Production.—As in preceding years, copper was New Mexico's chief mineral in 1941. The total value of minerals produced in 1939 was $69,921,765.

Table III.—*Principal Mineral Products of New Mexico, 1941 and 1940*

Mineral	Value, 1941 (preliminary)	Value, 1940
Copper	$16,745,508	$15,785,648
Zinc	5,752,516	3,819,438
Silver	996,619	1,001,130
Gold	996,415	1,258,005
Lead	511,280	382,200

(F. D. R.)

New South Wales. A state of the Australian commonwealth, lying in the southeast and occupying 309,432 sq.mi.; pop. (est. Dec. 31, 1940) 2,789,000. Chief cities (pop. est. Dec. 31, 1939): Sydney, capital (1,302,890); Newcastle (117,050). The state governor is Capt. the Rt. Hon. Lord Wakehurst.

History.—The elections for the state legislature were held in May and resulted in a crushing defeat of the United Australia party-Country party government which had held office since 1932. There was little difference between the programs of the defeated Premier Mair and the leader of the official labour party, McKell. Each side pledged itself to support the federal government in the prosecution of the war and each outlined plans for extensive public works and improved social services. A feature of the election was the failure of the left wing N.S.W. labour group to win a seat. The final figures gave McKell's party 54 seats; U.A.P. 15; C.P. 12 and Independents 9. Before the election, parliament had passed the National Emergency bill which gave the government wide powers to protect civilians in time of emergency by means of forced evacuation, compulsory billeting, blackouts, etc. A bill had also been passed in March reducing the unemployment and social services tax by 6*d.* a week on incomes of less than £6 a week and by 10% on incomes above £6. This concession operated from April 1 and was estimated to cost £1,000,000 a year.

Important among the many wartime developments within the state was the recommendation of the transport emergency committee that a bridge should be constructed across the Hawkesbury river at a cost of £1,300,000 and that the Cootamundra-Junee section of the southern railway line should be duplicated at a cost of £1,100,000. In case of interruption of coastal shipping these projects would enable essential transport services to be maintained. The war cabinet approved the proposals and by October the state government was able to report that work was proceeding satisfactorily.

Education.—In 1939: public schools, 3,285; teachers, 13,047; scholars on roll, 363,134; average attendance, 294,628; expenditure by state £A4,960,000.

Finance.—In 1940–41: revenue £A60,750,000; expenditure, £A61,610,000; debt outstanding (June 30, 1941), £A368,975,000.

Communications.—Roads (March 30, 1937), 46,108 mi. fit for motor traffic. Railways, government (March 1941), 6,141 mi. Tramways (June 1940), 172 mi. Motor vehicles licensed (March 31, 1941): cars, 206,876; commercial vehicles, 84,724; cycles, 21,148; buses, 878; taxicabs, 1,358. Wireless receiving set licences (June 1941), 1,293,266. Telephones (June 1940): exchanges, 2,016; instruments connected, 268,216.

Agriculture, Manufacturing and Mineral Production.—Production in 1940–41: wheat, 24,441,000 bu.; butter, 112,000,000 lb.; grease wool, 550,000,000 lb.; maize, 2,833,000 bu.; coal (1939), 11,196,000 tons; gold (1939), 87,189 fine oz. Industry and labour: average number of employees in factories (March 1941), 262,000; employment (June 1941), 95.5%.

(W. D. Ma.)

Newspapers and Magazines. War news was the "lead story" in nearly every newspaper almost every day in 1941. But, although interest in the engrossing war story, combined with the stimulation of radio news bulletins, greatly increased popular buying and reading of newspapers, the war story brought American newspapers more serious financial problems, rather than the greater prosperity that might be expected to accompany increased sales.

An increase of about 2% in circulation over the all-time record of 46,579,892 newspapers sold each day in 1940 was indicated by a preliminary cross-section survey of about two-thirds of the daily newspapers made by *Editor and Publisher* during Dec. 1941. While morning newspapers increased their sales about 2.79% and evening newspapers about 1.26%, Sunday newspaper sales went up 4.29%. On the other side of the ledger, in addition to the increased expense of gathering news from distant parts of the world by cable and radio, publishers faced rising costs of materials, increasing wages, shorter work week, added complex taxes and confusing priorities on metals, rubber and machinery that more than offset any gains in sales. With advertising, both local and national, continuing to decline, newspaper owners faced 1942 with even greater misgivings than during any year since 1918. The one bright spot in the financial picture was that, in spite of the scarcity of other types of paper, no shortage of newsprint paper had appeared by the end of the year, and the current price of $50 a ton seemed assured until April 1942. Early in the year a definite trend toward five-day newspapers was reported among smaller dailies to meet the increased costs imposed by wage-hour regulations.

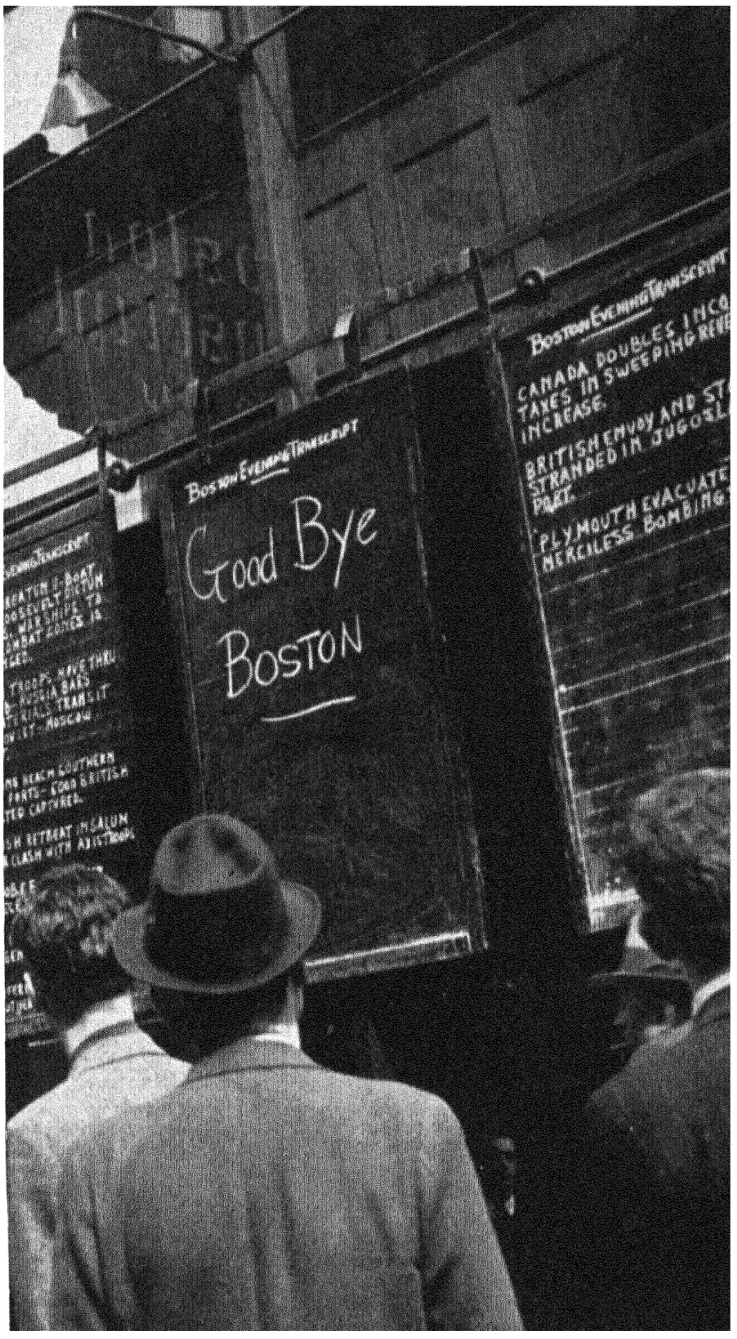
By August, the selective service draft had taken 1,613 news and advertising men, and the number of staff losses to war service increased sharply as the year continued. Before the nation declared war, more than 1,000 dailies had enrolled in a plan, originated by the *Philadelphia Bulletin*, to use some 500,000 newsboys as salesmen of defense stamps. Earlier disagreement with the foreign policy of President Roosevelt ended with the declaration of war, and there were no exceptions to the united newspaper support of the war effort; even the *Chicago Tribune*, prominent in the America First group, reversed the policy on Dec. 8. Much discussion of censorship, voluntary or otherwise, was heard early in the year, especially in connection with British warships in American ports for repairs, and the declaration of war brought the wartime regulation of news that was expected. On Dec. 16, Byron Price, executive news editor of the Associated Press, was appointed director of censorship, and complete war power of censorship over all communications was enacted by congress the next day. In spite of the tenseness of public opinion during the impending war emergency and the many possible occasions for disagreement between the press and governmental authorities, the year was notable for the almost complete absence of the criticism of the press by governmental officials and public

leaders that had been much in the air for nearly a decade. Part of this was undoubtedly due to the great attention directed by newspaper men, singly and in groups, to the problem of giving the public a more truthful picture of foreign events, with adequate background and interpretation, less coloured by rumour and propaganda, than was the case in 1914–18. Meanwhile, one of the most active foreign propaganda services in the United States had been eliminated in March by the arrest and deportation of Dr. Manfred Zapp and Guenther Tonn, of the nazi Transocean News service agency operating in New York. In retaliation, the nazis arrested and deported Richard G. Hottelet, of the United Press, and Jay Allen, of the North American Newspaper alliance.

Ten Biggest Stories of 1941.—The extent to which war news overshadowed all other kinds of news was evidenced in the lists of "Ten Biggest Stories of 1941" compiled by the Associated Press, the United Press and the International News service. All three agreed on no. 1 on the list, and two agreed on the first three. Only two nonwar items appeared in the three lists. The United Press list was: (1) the attack on Pearl Harbor and America's entrance in the war; (2) destruction of the legend that the Germans are invincible on land, as shown by the Russian successes after the nazi drive to the gates of Moscow; (3) the "all aid short of war" program of the United States, including the lend-lease bill, repeal of the neutrality act and defense production, with attendant strikes and labour trouble; (4) Rudolf Hess's flight to Scotland; (5) the meeting at sea between President Roosevelt and Prime Minister Churchill to draft the Atlantic charter; (6) U.S. occupation of Iceland and the loss of U.S. warships that were attempting to keep the sea lanes open to that outpost; (7) the battle of Libya; (8) the battle of Crete, involving the first use of air-borne troops and climaxing the nazi invasion of the Balkans; (9) the "V" for victory campaign and the rising tide of unrest in occupied Europe; and (10) the Hood-Bismarck battle. To this list, the Associated Press added: (7) six dreadnaughts sunk; (9) army acts in defense strikes; and (10) Brooklyn wins a pennant. I.N.S. added: (10) strike of captive coal miners, holding up national defense production.

Strikes.—Partly because of the war situation, fewer strike tieups in newspapers occurred than in recent years. Most unusual was the "strike," or trade boycott, in October of seven major New York city newspapers by the Newsdealers Federal Labor union, local 22,371, which numbered less than 1,000 of the 14,000 newsdealers in the city. Guild strikes suspended for a time the *Chester* (Pa.) *Times*, the *Birmingham* (Ala.) *Post*, the *Aliquippa* (Pa.) *Gazette*, and threatened the New York Jewish language newspaper, *The Day*. Printers' strikes suspended three newspapers in Champaign-Urbana, Ill. The American Newspaper Guild in October held an election coloured with charges of communism against the old administration of Donal M. Sullivan, president, Milton Kaufman, vice-president, and Victor Pasche, secretary-treasurer, and elected a new group headed by Milton M. Murray, of Detroit, Mich., and Sam Eubanks, of Oakland, Calif.

Miscellaneous.—A new victory for freedom of the press was seen in the decision of the supreme court of the United States on Dec. 8, reversing the decision in 1940 of the supreme court of California on the contempt of court charges against the *Los Angeles Times*. This followed a similar decision on June 10 in which the Missouri supreme court reversed a lower court and freed the *St. Louis Post-Dispatch* of like charges of contempt of court resulting from cartoons and editorials concerning a local criminal case. Much interest centred in the hearings of the federal communications commission on the problem of "newspaper-owned or controlled radio stations," during which it was announced that newspapers controlled 249 of the 838 broadcasting stations in the United States. Meanwhile, the *New York Times* started the broadcasting of news bulletins over WMCA in November. The second annual National Newspaper week, Oct. 1–8, fostered by the Newspaper association managers, was an important event, in which hundreds of dailies and weeklies participated and during which millions of readers inspected their newspaper plants. The American Newspaper Publishers association started a precedent by offering a prize of $1,000 for an essay on newspaper public service by a school of journalism student; as a preliminary, a prize of $500 was awarded to Phil Davis, cartoonist, for a medal design. Among the noteworthy anniversaries celebrated during 1941 were: the 90th birthday of the *New York Times* on Sept. 18; the 100th birthday of the *New York Herald-Tribune* on April 10, dated from Horace Greeley's founding of the *Tribune;* the 41st anniversary of the present Associated Press on Sept. 30. Plans were made for a $100,000 fund to restore St. Paul's Protestant Episcopal church, Eastchester, Mount Vernon, N.Y., as a national shrine to commemorate the Bill of Rights and the famous John Peter Zenger libel case which



THE BOSTON *EVENING TRANSCRIPT* wrote farewell on its news bulletin boards April 30, 1941, when it suspended publication after 111 years

resulted from an election in front of the church in 1733. The Associated Press in January announced the organization of a subsidiary Press Association, Inc., to handle radio news to non-members, various foreign services and other by-products, and placed the activity in charge of William J. McCambridge and Oliver Gramling of the A.P. organization. On Aug. 1 the A.P. purchased Wide World Photos, picture service of the *New York Times*. Great gains were made in wire transmission of photographs, and in July the first radiophotos were received from the U.S.S.R. Invention of a "blackout camera" utilizing infra-red light was announced by George Luxton, chief photographer of the *Minneapolis Star-Journal* in March.

The most notable newcomer in the newspaper world was the *Chicago Sun*, founded by Marshall Field, with Silliman Evans as publisher, printed in the plant of the *Chicago Daily News*, which appeared in the streets on Dec. 4 as a two-cent contestant of the morning monoply held by the *Chicago Tribune*. On April 30 the 111-year-old *Boston Transcript* ended publication; on Nov. 25 the 151-year-old *Bridgeport Times-Star* suspended; the *Philadelphia Evening Public Ledger*, published by Robert Cresswell, closed a day or two after the end of the year; the *Kansas City Journal* was sold on Oct. 22 by the Henry L. Doherty estate to Harry Newman. Harry Chandler retired as president of the *Los Angeles Times* on Feb. 25 and was succeeded by his eldest son, Norman; Edwin S. Friendly, general manager of the *New York Sun*, retired on April 25 from nine years' service as chairman of the bureau of advertising of the American Newspaper Publishers' association, and was succeeded by Frank E. Tripp of the Gannett newspapers; James G. Stahlman, publisher of the *Nashville Banner*, reporting as lieutenant commander under Secretary of Navy Frank Knox, publisher of the *Chicago Daily News*, was just one of the prominent newspaper men who went into military service.

Magazines.—Because of the continued decline in national advertising, 1941 was a quiet year in the magazine world. The picture magazine *Life*, selling over 3,200,000 copies, and the news magazine *Time*, approaching 850,000, both published by the same owners, continued to forge ahead in circulation. Other picture magazines, with the exception of *Look*, showed something of a decline in popularity. Among the weekly magazines, the *Saturday Evening Post*, selling 3,300,000 copies, *Collier's Weekly* selling 2,900,000, and *Liberty*, selling 2,300,000, more than held their own but exhibited more noticeably the new development of weekly war news articles transmitted by cable or radio from their travelling correspondents abroad, including W. B. Courtney and Quentin Reynolds for *Collier's* and Charles Codman and Leigh White for the *Post*. Among the monthlies, *American Magazine*, selling 2,200,000 and *Cosmopolitan*, exceeding 1,800,000, held their leadership, while the *Reader's Digest* and the *National Geographic Magazine* continued to be staples in popularity. Among trade journals, business papers and small specialized periodicals, the year proved to be a more profitable one, especially for those publications related to trade associations. Because of difficult business conditions, few new publications were launched; however, there were several notable new ones: publication of the *American Boy*, combined with the *Youth's Companion*, both of which had been discontinued, was revived in September by James A. Humberstone of Detroit, Mich.; in July Marshall Field, owner of New York's *PM*, launched a new week-end newspaper magazine supplement, entitled *Parade*, which by fall had been purchased by 13 large newspapers and attained 1,500,000 circulation. Two former *PM* writers, Richard O. Boyer and Marion Bachrach, started in Chicago in November a new national weekly review called *U.S. Week;* McGraw-Hill Publishing company of New York in September launched a picture and news magazine in Spanish and Portuguese, *En Guardia*, for distribution in Latin and South America; *Time* magazine published several aeroplane editions, printed in Spanish on thin paper, for aero distribution in South America. Throughout 1941, closer attention to significant news events was the greatest feature in the magazine world. (G. M. Hy.)

Great Britain.—The newspaper and periodical industry of Great Britain, with its prewar income of £53,000,000 and some 80,000 direct employees on the newspaper side alone, is one of the largest in the country. Loss and dislocation of business, most serious as it certainly was, was only one of its troubles in 1941; and this was met by organization and mutual self-help, as when papers at Coventry, Plymouth and Southampton were, after their various "blitzes," printed by rival houses in Birmingham, Exeter and Bournemouth respectively, while in London the great nationals appeared next morning in spite of destruction of plant and material and the failure of every sort of power. Other difficulties faced included rising costs, serious paper shortage and the somewhat harassing conditions imposed from time to time by a ministry of information which seemed often to underestimate the value of journalistic experience and technique in the realm of propaganda—though among journalists themselves it was generally agreed that the service departments and not the ministry were usually responsible for the unnecessarily cautious and irritating decisions forbidding publication of innocuous news.

On the whole, official action in respect to the industry was slight; it was specially excluded from the board of trade's concentration of industry scheme, and only once—in the case of the *Daily Worker*, export of which had been prohibited in May 1940—did the home secretary exercise his power of suppression. This was in January, when he ruled that its stock contents were calculated to foment opposition to the successful prosecution of the war, and the ban extended to its mimeographed offshoot, the *Week;* in spite of numerous attempts in and out of parliament to effect its cancellation after Great Britain's alliance with the U.S.S.R. it remained in force in 1941.

The press's most complicated problem, the provision of raw material, was, within the limits imposed by its scarcity, successfully met by the Newsprint Supply company, an organization representing the whole press of Great Britain formed early in 1940 to pool all available supplies for the benefit of all national, provincial and Scottish papers. Its activities, coupled with the regulation of price instituted by the government paper controller, prevented undue hardship and kept prices steady; but the reduction in size of all publications, and the narrowing of columns in many, adversely affected advertisement revenue returns and led to an all-round increase of rates and higher charges in the case of many papers and most magazines. The drop in national advertising was to some extent met by that on government account, as is shown by the fact that during the year June 1940–May 1941 the expense incurred under this head by the home office and ministry of labour alone amounted to nearly £120,000. The following figures giving the profits of a number of concerns as shown in the 1941 balance sheets compared with those (in brackets) for 1940 testify to the general prosperity of the industry: Allied, £937,689 (£870,222); Associated, £469,542 (£401,018); Daily Mirror, £188,545 (£300,509); Illustrated London News and Sketch, £16,336 (£24,369); Illustrated Newspapers, £16,021 (£86,492); Sunday Pictorial Newspapers, £208,709 (£203,643); the Amalgamated Press profit at £593,555 showed an increase of approximately £90,000.

The acute shortage of paper had small effect on the total number of papers published, but whereas in Sept. 1939 the newspapers' weekly consumption of newsprint was 11,100 tons, by the early months of 1941 it had been reduced to 3,200 tons. The percentage reduction becomes more marked if the periodical publications are taken into account, for by suppression or suspension and amalgamation they were able to effect additional economies; all made drastic cuts in the number of pages and many adopted the popular "pocket-size" format. The prohibition of the "on sale or return" system was rescinded in February, but the ban on new issues remained, and was lifted only in favour of organizations of a national character mostly from enemy-occupied countries, a few service and home guard publications (among which were the fortnightly bulletins issued only to officers of the newly formed army bureau of current affairs), and a sprinkling of trade and professional journals of wartime importance, like

the *Power Farmer*, a 6*d*. monthly published by the Power User's association. The useful pamphlet reprints of collections of war articles by some papers—notably the *Times* and *Sunday Times*—should also be mentioned.

Toward the end of the year the Press association, after consultations with the chancellor of the exchequer and the minister of information, sold half its interest in Reuters Ltd. to the Newspaper Proprietors' association, thereby giving the London press, which had hitherto not been directly represented on the board, a power equal to that of the provincial press—formerly its sole controllers. A trust consisting of eight leading proprietors (four London, four provincial) was set up under a chairman appointed by the lord chief justice, to ensure the independence and integrity of the agency and the reliability and equable dissemination of its news service and to prevent the possibility of Reuters falling into the hands of any group or faction. The trust is irrevocable for 21 years, and can thereafter be amended or dissolved only with the consent of the lord chief justice. (*See* ADVERTISING; PRINTING.) (L. H. D.)

New York.

One of the original 13 states of the union, popularly known as the "Empire state," New York covers an area of 49,576 sq.mi., of which 1,647 sq.mi. are water. With a population of 13,479,142 (federal census, 1940) it retained its place as the most populous of the states. It had in that year a white foreign-born pop. of 2,853,530, which included 316,800 born in Germany and 584,075 born in Italy. The capital is Albany, with a pop. of 130,577. Among the other cities are New York, with a population of 7,454,995, or about twice as many as any other city in the U.S.; Buffalo (575,901); Rochester (324,975); Syracuse (205,967); Yonkers (142,598); Utica (100,518); Binghamton (78,309); Troy (70,304).

History.—During 1941 the legislature created a division of commerce as an executive department to take over the work of the state planning council and the publicity bureau. It is headed by a commissioner of commerce, appointed by the governor and confirmed by the senate, who is directed to promote the development of business and to compile periodically a census of business and industry within the state and to make recommendations for the removal of any burdens imposed on business by law or otherwise. In order to discourage the circulation of scurrilous campaign documents, a law was passed forbidding the circulation of any political circulars unless they bear the name and address of the printer or of the person or organization responsible for them. The emergency income tax of 1% was not renewed, thus saving the taxpayers $21,000,000 a year. An appropriation of $247,000 was voted to the committee investigating the cost of the public schools and the extent of subversive activities in them. The appointment of boards to inquire into labour disputes was authorized, and the mortgage moratorium was continued for another year. Persons voluntarily leaving their jobs were barred from unemployment insurance benefits; the creation of a state defense council was authorized; an appropriation of $600,000 for vocational education was voted; and several bills intended to bar communists and other radicals from subversive activities were killed.

Four constitutional amendments were submitted to the voters in the November election. One lengthened the term of state senators from two to four years. Previous amendments had lengthened the term of the governor to four years and the term of the members of the assembly to two years without changing the term of the senators which had always been twice as long as that of the members of the assembly. The amendment was defeated. The voters, however, approved an amendment permitting the use for highway and parkway improvement of the proceeds of an issue of $60,000,000 in bonds originally authorized for the elimination of grade crossings over railroads. They also approved a proposal for building 20 mi. of ski trails on Whiteface mountain in the Adirondack forest reserve and another amendment validating future amendments even though certain technical regulations had been disregarded.

Education.—There were in the state, in 1941, 9,488 public schools with a total registration of 2,174,955 pupils instructed by 80,553 teachers. The elementary schools numbered 8,615 with 1,469,913 pupils, and there were 973 high schools with 705,042 pupils. The state supported eleven normal schools and teachers' colleges with 10,349 students and 578 teachers. There were also 86 colleges and universities. The public schools are under the supervision of the board of regents of the University of the State of New York, the head of which is the superintendent of public instruction.

Public Welfare, Charities, Correction.—An average of 400,866 persons a month received public assistance of some kind during the fiscal year 1940–41 at a cost of $162,423,945 for the year. Included in this number were 120,598 receiving $37,819,405 for old-age relief; 34,553 dependent children for whose support $19,150,904 was paid; and 2,864 blind persons receiving $904,068. There were 14 institutions under the supervision of the department of correction with a population of 18,093. On June 30, 1941 there were 2,526 inmates in Sing Sing prison, 1,673 in Auburn prison and 1,534 in the Great Meadow prison. The cost of maintaining these institutions for the year was $10,004,823.12 or $553.10 per capita. The average number of WPA workers each month during 1941 was 131,041, or 14.9% fewer than in 1940, and their earnings were $108,803,000, a reduction of 14.1%.

Communication.—There were in the state 71,034 mi. of town and county roads and 14,043 mi. of state highways, a total of 85,077 mi. Of the town and county roads 45,144 mi. were improved, and 12,751 mi. of the state roads were also improved. The appropriations for the state highways for the fiscal year 1940–41 were $33,604,674, of which $8,299,635 was received from the federal government. The counties spent $15,513,390.64 and the towns $17,561,553.37. On Jan. 1, 1941, there were 2,926,900 telephones in use. On the same date there were 7,731.49 mi. of main-line railroads in operation.

Banking and Finance.—On June 30, 1941, there were in the state 1,273 financial institutions incorporated under the banking laws or under the supervision of the banking department. Included in this number were 162 state banks, 160 trust companies, 15 industrial banks, 7 private banks and 134 mutual savings banks. The total deposits in all these institutions were $19,101,128,106. The total capital was $670,759,510, and the total resources were $22,798,589,807. Included in the institutions reporting to the banking department were 198 savings and loan associations with resources of $266,590,527, of which $236,240,731 was due to shareholders. In addition to the banks under state control there were, on Nov. 5, 1941, 425 national banks with capital of $275,500,000, deposits of $8,476,568,000 and assets of $9,394,871,000. The total receipts of the state government for the fiscal year ending June 30, 1941, were $428,108,405.28 and the expenditures were $391,047,794.31, leaving an operating surplus of $37,060,610.97. After wiping out accumulated deficits there was a net surplus of $7,029,256.67. The state had a gross bonded debt of $676,157,000. The sinking fund contained $146,696,980.48, which leaves a net debt of $529,460,019.42.

Agriculture.—There were in the state 153,238 farms with a total acreage of 17,170,337 (U.S. census, 1940). The value of the products sold on the farms reporting for 1939 was $273,175,053, of which $167,052,240 consisted of livestock and livestock products, $73,885,420 crops and $2,479,536 forest products.

Table I.—*Leading Agricultural Products of New York, 1941 and 1940*

Crop	1941	1940
Corn, bu.	26,169,000	21,452,000
Oats, bu.	24,166,000	29,960,000
Barley, bu.	2,664,000	3,790,000
Tame hay, tons	4,189,000	5,681,000
Tobacco, lb.	2,100,000	1,750,000
Potatoes, bu.	2,766,000	2,845,700
Apples, bu.	16,120,000	12,936,000
Grapes, tons	56,800,000	75,800,000

Manufacturing.—In 1939 there were 34,506 manufacturing establishments, employing 957,844 persons, paying $1,163,785,198 in wages and producing goods valued at $7,134,400,147.

Table II.—*Principal Industries of New York, 1939 and 1937*

Industry	Value of products	
	1939	1937
Boots and shoes	$104,144,500	$125,819,448
Bread and bakery products	204,500,887	243,386,287
All clothing	917,562,506	842,556,856
Steel products	107,884,816	157,800,733
Printing, including all periodicals	426,760,806	576,731,209

Mineral Production.—The total value of the minerals produced in 1939 was $78,383,851.

Table III.—*Principal Mineral Products of New York, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Cement	$ 9,866,102	$ 7,893,270
Coke	24,526,646	23,520,138
Ferroalloys	18,388,766	7,699,520
Petroleum	10,650,000	9,550,000
Pig iron	45,275,716	25,450,764
Salt	5,855,422	5,467,077
Sand and gravel	7,050,104	6,493,099
Stone	10,111,032	10,527,452

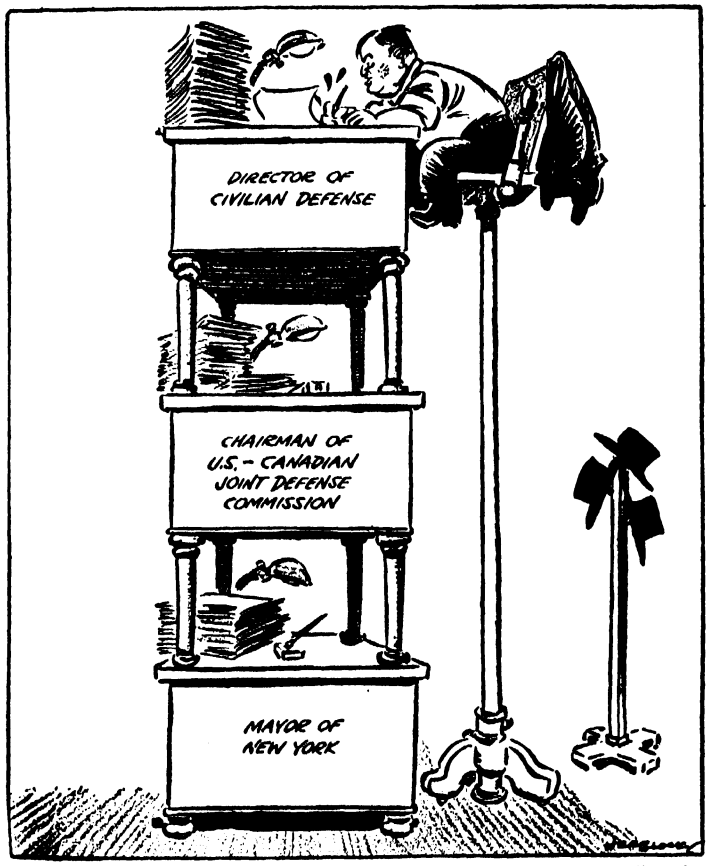
(G. W. Do.)

New York City.

Fiorello H. La Guardia was re-elected mayor of New York city Nov. 4, 1941 for a third term of four years, the only mayor in the history of the city to be chosen for three terms in succession. He was nominated by the American Labor party of which he is a member and endorsed by the Republican, the Fusion and the United City parties. President Roosevelt also urged the voters to support him. As the American Labor party polled a vote twice as large as La Guardia's majority, it claimed credit for his election. The Democratic candidate was William O'Dwyer, district attorney of Brooklyn, who had succeeded in convicting the members of a gang engaged in murder and had in other respects made a good record. The controller and the president of the city council, supported by the parties which backed the mayor, were re-elected, and enough other members of the board of estimate in sympathy with the policies of the mayor were successful in giving him a majority in that important policy-making body. The Democrats elected two of the five borough presidents, the other three being men who would work with the mayor.

A city council was chosen by the proportional representation system with one councilman from each borough for every 75,000 votes polled and another if there was a remainder of 50,000 votes. The rise in population resulted in an increase in the size of the council from 21 to 26 members, with a gain of two from Brooklyn and one each from Manhattan, Queens and the Bronx. The Democrats elected 17 of the councilmen, the Republicans 2, the American Labor party 3, the Fusionists 2 and the Independents and Communists 2 each. As 378,393 blank or invalid ballots were cast, it was evident that the voters found it difficult to understand the system of voting.

More remarkable than the re-election of Mayor La Guardia for a third term was the election of Francis S. Hogan as district attorney of New York county. Hogan, the first assistant under District Attorney Dewey, obtained the evidence on which a Tammany district leader was convicted and sent to prison. Dewey was not a candidate for re-election and public sentiment demanded that his successor should be a man who would continue the work which he had begun. The force of this sentiment was recognized by the leaders of Tammany Hall, and in August they announced their intention to support Hogan. He was endorsed by the parties supporting the mayor's candidacy and was unanimously elected.



"LA GUARDIA AT WORK" as viewed by Herblock of NEA Service after the New York mayor was appointed director of U.S. civilian defense in 1941

A revolutionary change in the organization of the county governments within the city was authorized by the adoption of an amendment to the city charter abolishing the offices of sheriff, register, register of wills and registrar in the five counties and providing that there should be one sheriff and one register for the whole city appointed by the mayor from a civil service eligible list. An estimated saving of $500,000 a year was expected to result from the change.

In October the city council reduced the tax of 2% on goods bought within the city and 3% on goods bought outside for use within the city to a uniform rate of 1%. The abandonment of the elevated railroad lines in Manhattan was extended to Brooklyn by the removal of the elevated structure from Fulton street. Buses were substituted for trolley cars on the street. The City Housing authority demolished 785 old buildings to make way for a $20,000,000 housing development in the neighbourhood of Fort Greene park in Brooklyn with accommodations for 3,535 families. The Brooklyn Public library, begun in 1912, on which work was suspended in 1919, was completed at a cost of $5,000,000. (*See* also MUNICIPAL GOVERNMENT.) (G. W. Do.)

New York University.

This institution at New York, N.Y., although maintaining first place among U.S. institutions in point of student enrolment, with 43,671 men and women, sustained a loss of some 10% in 1941, partly because of the call to military service but more largely because of employment in defense industries. Fifty-nine members of the faculty were relieved of academic duty to join the U.S. armed or civilian forces engaged in defense activity.

Some 2,000 special students received training in short engineering courses, government-sponsored, thus augmenting the supply of defense industry technicians. In all other divisions the program of instruction stressed defense activity in various forms. The Washington Square College of Arts and Science introduced four-year courses combining liberal arts with such vocational specialties as X-ray technology, motion picture technique and actuarial mathematics.

The 100th anniversary of the college of medicine was celebrated in 1941. Plant improvements included an addition to the Sage electrical engineering laboratory at University Heights and provision of a new chancellor's house at 5 Washington square. Gifts received by the university exceeded $664,000. The operating budget for the year was $8,667,353.71. Book collections exceeded 600,000 volumes. The faculty numbered 2,249. The year's award of degrees and certificates totalled 4,750. (H. W. CH.)

New Zealand, Dominion of.

A British dominion, consisting of a group of islands lying in the south Pacific between 34° 25′ and 47° 17′ S., and between 166° 26′ and 178° 36′ E. Area: Dominion proper, 103,415 sq.mi.; other islands, 519 sq.mi.; pop.: Dominion proper (est. March 31, 1940), 1,640,901 (Maoris 90,980); Cook and other Pacific islands (census 1936), 16,350. Chief cities (pop. est. April 1, 1939): Auckland (221,500); Wellington (cap. 157,900); Christchurch (135,400); Dunedin (82,800). Language: English. Religion: Christian (1936 figures, excluding Maoris: Church of England 600,786; Presbyterian 367,855; Roman Catholic 195,261; Methodist 121,012). Ruler: King George VI; governor gen-

eral, Air Marshal Sir Cyril Newall, O.M.

History.—During 1941 New Zealand's military forces were involved in the costly campaigns in Greece and Crete and in consequence the dominion became increasingly conscious of the gravity of the issues at stake. The prime minister, Peter Fraser, visited the New Zealand forces in the middle east on his way to Britain and the United States. While in London he attended sessions of the war cabinet and expressed himself well satisfied with the existing media of imperial co-operation.

New Zealand's first echelon completed its training in Egypt. The second was diverted to England when Italy entered the war, later proceeding to Egypt after taking part in the Dover Command's anti-invasion vigil. The third echelon went direct to Egypt. In the fighting of early 1941 in the western desert New Zealanders took part in patrol operations. They were again in action in this area during the second Libyan campaign which began Nov. 18. In the Greek campaign, New Zealanders, with Australians and British troops, fought one of the greatest rearguard actions in history. Prime Minister Fraser announced that the government was fully consulted and fully accepted its share of responsibility for the decision to send troops to Greece. In Crete the Allied troops were placed under the command of New Zealand's commanding officer, Major General Bernard C. Freyberg. When the German air invasion began, New Zealand troops, including the Maori battalion, fought superbly without air support. After the evacuation, Brigadier L. M. Inglis was sent to London to report on the lessons of the campaign. The award of the Victoria Cross to three members of the Canterbury regiment, 2nd New Zealand expeditionary force, was announced in October.

New Zealanders of the R.A.F. and R.N.Z.A.F. won many decorations for valour. Sergeant J. A. Ward, the dominion's first V.C. of the war, was reported missing in September. The New Zealand navy was given the title "royal."

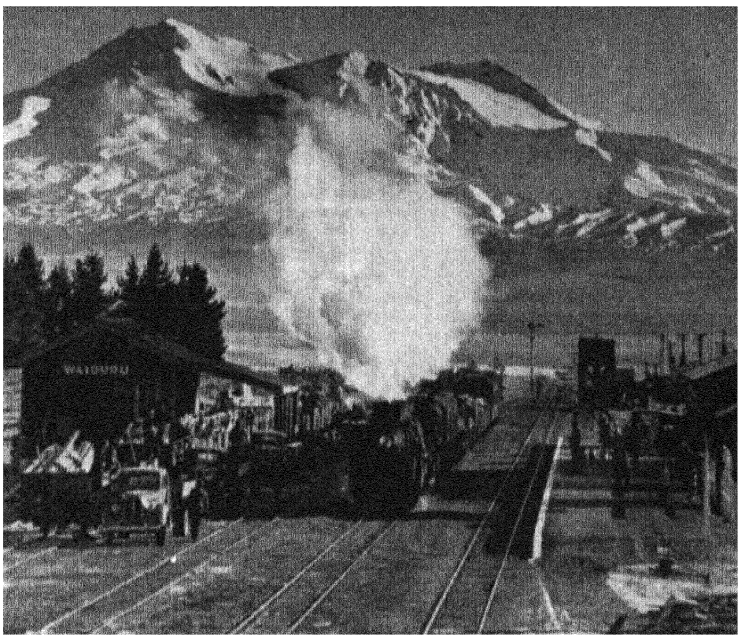
In March the prime minister referred to the desirability of direct diplomatic relations with the United States. F. Langstone, minister of lands and J. G. Coates visited the United States on a war mission. Arrangements for opening a legation at Washington were made. An agreement with Australia provided for a permanent consultative committee, consisting of the two countries' ministers of supply and other ministers as required, to meet at regular intervals in both countries. R. Semple, minister of national service, on his return from Australia, said that so far as allocation of war supplies produced in Australia was concerned, New Zealand would be treated on the same basis as any one state of Australia.

On Dec. 7 New Zealand declared war on Finland, Hungary and Rumania and on Dec. 9 on Japan.

At the end of 1940 a committee appointed by the Economic Stabilization conference made a series of recommendations intended (1) to stabilize prices, wages and cost, so that the burden of war should be evenly distributed; and (2) to increase production and efficiency. Oversea borrowing, it recommended, should be reduced to the minimum. Increased primary production should be fostered by making farm labour conditions more attractive.

In internal politics there was no truce in spite of the war. The "National" party, although represented in the war cabinet by A. Hamilton and J. G. Coates, replaced the former as its leader by S. G. Holland, a move resented by the government (Labour) party. Dr. D. G. McMillan and W. Lee Martin left the Labour cabinet owing to ill-health and were succeeded by A. H. Nordmeyer and J. G. Barclay. In October it was announced that the general election due in November would be postponed for a year.

In his budget statement in July, W. Nash proposed no increase of taxation and said the government's objective was "to maintain the standard of living at the highest level possible after we have



IN THE REMOTE TOWN of Walouru, at the base of Mt. Ruapehu, New Zealanders worked 20 hours a day in 1941 to complete a military training camp

contributed supplies and done all that can be done to help win the present conflict." Reviewing the war expenses account to July 31, Adam Hamilton said that New Zealand seemed determined to conduct the war without domestic sacrifices. He hoped it would be possible to continue social benefits and still not go short so far as war needs were concerned. Total receipts of the account from Sept. 1939 were: from loans £24,612,237 (£8,176,988 borrowed overseas, balance in New Zealand); from taxation £24,517,550, with other receipts amounting to £3,400,000. Total expenditure £47,000,000, but more than £5,000,000 was amortization of debt.

Education.—(Dec. 1939) state elementary schools, 2,230; scholars 245,786; secondary 197; scholars 55,300. University of New Zealand had six constituent colleges, including two agricultural colleges at Lincoln and Palmerston North, grouped together as the New Zealand school of agriculture. Number of students: 5,979.

Finance.—Revenue, consolidated fund, year to March 31, 1941, £40,438,000; expenditure £38,712,000; public debt (March 31, 1940) £322,907,536; note circulation May 26, 1941, £21,782,022; reserve (in Reserve bank) May 26, 1941, gold £2,802,000, sterling £21,240,184. Net oversea funds, April 28, 1941, £NZ.32,188,454. Exchange rate: £NZ.125=£100 sterling (£1=approx. $4.03½ U.S.). Deposits in post office and trustee savings banks (March 31, 1941) £77,715,381; depositors, 1,250,000.

Trade and Communication.—Oversea trade: exports for year ending June 30, 1941, £65,766,000 (compared with £65,859,000 in 1940); imports for year ending June 30, 1941, £46,185,000 (compared with £46,070,000 in 1940). Communications and transport: total length of roads 53,086 mi., including main highways 12,465 mi.; railways 3,400 mi.; passenger journeys, year to March 31, 1941, 26,276,923 (compared with 24,454,014); goods traffic 8,426,182 tons (compared with 7,673,950). Shipping (1939) entered 2,974,833 tons net, cleared 3,032,981 tons net; commercial air transport (year to March 31, 1941), miles flown: internal services 1,029,588, overseas 459,608. Motor vehicles licensed (March 1941): cars, taxis 221,187; trucks 48,477; buses 747; motorcycles 18,276; wireless receiving set licences 341,481; number of telephone subscribers 165,151.

Agriculture.—(1939–40) Acreages: wheat, for threshing, 257,532, total, 269,779; oats, for threshing, 49,751, total, 268,541; barley, for threshing, 25,262, total, 31,728; maize, for threshing, 7,962, total, 14,352; linseed, 1,216; peas, for threshing, 21,323; potatoes, 20,033; onions, 839; peren-

MEMBERS of New Zealand's Women's War Service auxiliary on parade in Auckland in the spring of 1941

nial rye grass, 43,895; western wolths and Italian rye grass, 6,843; cocksfoot, 10,255; tobacco, 1,828. Yields, total and per acre; wheat, 8,010,089 bu. (31.10); oats, 2,081,106 bu. (41.83); barley, 915,805 bu. (36.25); maize, 404,179 bu. (50.76); linseed, 8,788 cwt. (7.23); peas, 563,159 bu. (26.41); potatoes, 141,105 tons (7.04); onions, 8,025 tons (9.56); perennial rye grass, 13,399,456 lb. (305); western wolths and Italian rye grass, 2,597,831 lb. (380); cocksfoot, 1,063,394 lb. (104); tobacco, 1,555,631 lb. (851).

Livestock in dominion, 1940: horses, 271,581; cattle, 4,533,032 (including 1,850,071 dairy cows in milk and dry); pigs, 714,001 (including 92,759 breeding sows); sheep, 31,062,875 (including 19,727,657 breeding ewes).

Manufacturing.—Factory production (1939–40): number of establishments, 6,342; total number of employees, 108,722; salaries and wages paid, £24,460,549; value of products, £129,061,826; value of land, buildings, machinery and plant, £80,573,475. (A. J. Hp.)

Nicaragua. A Central American republic lying between Honduras and Costa Rica and reaching from the Caribbean sea on the east to the Pacific ocean on the west. Area, 49,000 sq.mi.; pop. (est. 1941) 1,172,324; language: Spanish; capital: Managua, pop. 70,000; president: General Anastasio Somoza.

History.—During 1941, domestic happenings in Nicaragua were dwarfed by world developments. Pres. Somoza's government followed a policy of close collaboration in hemisphere defense. It co-operated with U.S. bans on extra-hemispheric export of strategic materials, supported the black list of axis business firms, refused to prohibit showing of anti-dictatorship films and invited the United States to establish air and naval bases on Nicaragua's coasts.

In September Nicaragua severed consular relations with Germany. The axis attack upon the United States in December was promptly answered by Nicaraguan declaration of war against the principal axis powers and by steps to put the country on a war basis.

Economically, the year was marked by continued accelerated increases in gold mining, and by efforts to stimulate agriculture and industry through crop loans, financing of agricultural exports, and long-term industrial loans. Commercial development of wild rubber and expansion of chicle production were especially emphasized. Meanwhile, shortage of fuels and other needed commodities, owing to war conditions, and an undue dependence upon the foreign-dominated gold-mining industry, whose chief return to the country is in wages, rendered the immediate outlook for solid economic prosperity uncertain.

Education.—In 1937–38, there were 796 primary schools, with 53,184 students and 8 secondary schools, with 849 pupils. The Central university (established in Sept. 1941) is at Managua.

Defense.—Nicaragua had a standing army of around 3,000 in 1941, with reserves of 10,000. Compulsory military service for males from 18 to 35 was introduced in 1941. The small air force included 20 planes. Nicaraguan aviators were being trained in the United States.

Finance.—The monetary unit is the córdoba, tied to the U.S. dollar at 20 cents. The original 1940–41 budget was balanced at 25,503,219 córdobas, a 20% increase, after a 1940–41 surplus of more than 2,000,000 córdobas. In May 1941, supplementary appropriations approximating 5,000,000 córdobas were made; these were primarily to cover earlier government salary increases ranging up to 30%, and to provide an additional flat 10%. The national debt (1941) was $4,402,354, including $1,884,167 of otherwise unexpended U.S. Export-Import bank credits of $4,500,000.

Trade and Resources.—In 1940, exports were $9,494,142, a 17.4% increase, with gold (60.6%), coffee (22.1%) and bananas (4.7%) the principal commodities. In 1941 gold exports increased 26% over 1940, exceeding $7,000,000 in value. Virtually all Nicaraguan exports are to the United States (1940: 94.2%). Coffee, the leading agricultural export, is under a quota, with a 1941–42 allotment of 216,450 bags to the United States (1940 export: 244,905 bags). Imports (textiles, machinery and foodstuffs) were $7,052,486, a 10.8% increase, and came largely from the United States (84.0%), Great Britain (3.0%), Peru (2.7%) and Japan (2.3%).

Communication.—There is good external communication by sea and by Pan American Airways. Internal facilities are, however, inadequate, with 227 mi. of public railway and 1,882 mi. of main highway in 1941. The latter was being extended, however, especially through United States credits for completion of the Inter-American highway. (L. W. Be.)

Nickel. Although specific data were lacking, general information indicated that new high world records were made in world production of nickel in 1939, 1940 and 1941, as compared with former record of 114,400 metric tons in 1937. World consumption was estimated at 250,000,000 lb. in 1939 and 290,000,000 in 1940.

Nickel production in the United States is confined to a few hundred tons annually as a by-product in the refining of copper, and considering the nature and value of the metal, there is a comparatively small amount recovered as secondary metal (5,150 short tons in 1940); this means that each year practically the whole of the consumption demand must be supplied by new imports, most of which come from Canada. Imports are growing constantly, the gross weight of nickel products imported having averaged 9,073,000 lb. monthly in 1937, 10,781,000 lb. in 1939, 15,375,000 lb. in 1940 and 20,872,000 lb. in the first eight months of 1941. Corresponding figures for exports were 636,000 lb. in 1937, 1,581,000 lb. in 1939, 1,820,000 lb. in 1940 and 1,178,000 lb. in the first eight months of 1941. In spite of the fact that net imports were more than 40% greater in 1941 than in 1940, the supply was insufficient to balance consumption demands, and it was necessary to impose a mandatory priority basis on the distribution and use of nickel, effective March 7, 1941. This limits the use of the metal to products essential in the defense program, and for the duration of the war, or until greater supplies of nickel can be made available, all nonessential uses will be cut to a minimum.

The only indicator available on the trend of operations in Canada, aside from the rising imports, was an increase of 17% in the net operating profit of the International Nickel Co. in the first half of 1941 as compared with the first half of 1940; in view of generally rising costs for labour, materials, etc., while the price of nickel remains unchanged, this probably indicated an even greater increase in output. (G. A. Ro.)

Niger: *see* French Colonial Empire.
Nigeria: *see* British West Africa.

Nimitz, Chester William (1885–), U.S. naval officer, was born Feb. 24 in Fredericksburg, Tex., and was graduated from Annapolis in 1905. An experienced submarine officer, he commanded a submarine flotilla in 1912 and during World War I he was chief of staff to the commander of the Atlantic fleet's submarine force. He was assistant chief of the bureau of navigation, 1935–38, and became chief of the bureau in 1939. He was promoted to rear admiral, June 23, 1938 and was commander of Battleship Division 1 of the Battle Force, 1938–39. On Dec. 17, 1941 the navy high command was overhauled after the surprise attack on Hawaii, and Admiral Nimitz was made commander-in-chief of the Pacific fleet, with the rank of admiral. He assumed his post at Pearl Harbor on Dec. 31.

Nitrogen, Chemical. The combined nitrogen supply of the world comes chiefly from three sources: nitrogen of mineral origin comes from the sodium nitrate deposits of Chile, and from the widely scattered by-product coke industry, which recovers the small percentage of nitrogen in the coal treated, and markets it as ammonium sulphate; the third source is the nitrogen of the air, which by several different processes may be combined to form nitrates and ammonia. In 1905 the world supply was entirely from the mineral sources, in the ratio of two-thirds from Chilean nitrate and one-third from coal. The air fixation industry began in 1906, and by 1914 the ratios were 54% from Chilean nitrate, 36% from coal and 10% from air. The heavy demand for nitrates incident to World War I gave the air industry an opportunity to expand at a rapid rate, and this was accompanied by a corresponding expansion in by-product coking, with the result that in 1918 the ratios had changed to 42% from Chilean nitrate, 35% from coal and 23% from air.

During the postwar period, expansion of air processes was rapid and cut proportionately into the markets for mineral nitrogen, giving ratios of 23% from Chilean nitrate, 21% from coal and 56% from air in 1929. The depression years cut heavily into the markets for mineral nitrogen, but had little effect on the progress of the air processes, so that while the mineral sources made a good recovery they were not able to come back to their former predominant place; in 1937, the latest year for which data are available, the ratios stood at 8% from Chilean nitrate, 17% from coal and 75% from air.

There were no data on which to base an estimate of the 1941 status, but it seemed probable that the trend of affairs would follow much the same pattern during World War II as it did during World War I; that is, there would likely be a rapid expansion of output in all three branches of the combined nitrogen industry, but with the air processes well in the lead; in fact, much of this anticipated expansion was already under way. Expansion of the demand for coke was expected to keep coal in second place as a source of nitrogen. With the war over, there would have to be another readjustment of production levels to bring them back to a normal basis, and in the redistribution of world markets it seemed probable that the air branch of the industry would again be able to absorb a share that would make even lower ratios than ever before for the producers of mineral nitrogen. (G. A. Ro.)

NLRB: *see* NATIONAL LABOR RELATIONS BOARD.

Noel, Carlos Martin (1886–1941), Argentine statesman and writer, was born Oct. 30 in Buenos Aires. He was twice mayor of Buenos Aires and also served as minister and later ambassador to Chile. In 1930 and again in 1933 he was exiled for his activities in the Civic Union Radical party. In 1936 he was elected to the chamber of deputies and served as president of the chamber in 1936–37 and 1937–38. His private library was one of the most famous in Argentina. Noel wrote works on economics and the theatre and a novel on Don Juan. He died Jan. 3 at Pocos de Caldas, Brazil.

North Borneo: *see* BORNEO.

North Carolina. A south Atlantic coast state, popularly known as the "Old North state" or the "Tar Heel state," North Carolina is one of the original 13 states of the union; area 52,712 sq.mi.; pop. (1940), 3,571,623, of which 974,175 (27·3%) were urban, 2,597,448 (72·7%) rural and 1,005,501 (28·2%) nonwhite. Capital, Raleigh (46,897); Charlotte, the largest city (100,899); Winston-Salem (79,815); Durham (60,195); Greensboro (59,319); Asheville (51,310).

History.—In North Carolina the year 1941 was characterized by activity in national defense and war, by the inauguration of J. Melville Broughton as governor Jan. 9, and by the regular biennial session of the state legislature, Jan. 8–March 15, which was unusually harmonious, brief, liberal and amenable to the new governor's leadership. Expanding business activity permitted the legislature to increase appropriations to the biennial record total of $166,500,000, to levy no new taxes and to exempt foods for the home table from the 3% sales tax. The legislature contributed notably to educational development by doubling the support of vocational education, appropriating more liberally for public schools and higher institutions, increasing the salaries and security of public school teachers, adding a 12th grade to the public school curriculum and adopting a retirement system for teachers and state employees. State aid of $100,000 a year was extended to public libraries. A 12th congressional district was created and representation in the U.S. senate and house of representatives was reapportioned. The legislature created the motor vehicle department and reorganized the utilities commission, the state highway and public works commission, the unemployment compensation commission, the department of conservation and development and the revenue department, vesting appointive power in the governor.

Important state officers in 1941 were: J. Melville Broughton, governor; R. L. Harris, lieutenant governor; Thad Eure, secretary of state; George Ross Pou, auditor; C. M. Johnson, treasurer; Clyde A. Erwin, superintendent of public instruction; Harry McMullan, attorney general; W. P. Stacy, chief justice.

Education.—North Carolina maintains separate public schools for whites, Negroes and Indians, with a minimum eight months' term and compulsory attendance from 7 to 13 years, inclusive. In 1939–40, there were 3,858 public elementary schools with 18,579 teachers and 703,597 pupils and 975 public high schools with 6,859 teachers and 205,213 pupils, operated at a cost of $30,811,279, about four-fifths of which was contributed by the state government. The state maintained three branches of the consolidated University of North Carolina at Chapel Hill, Raleigh and Greensboro, with 778 teachers and 14,045 students in 1940–41. It also maintained seven teachers' colleges with the following teaching staff and enrolment for 1940–41: East Carolina Teachers college at Greenville, 91 and 1,248; Western Carolina Teachers college at Cullowhee, 50 and 642; Appalachian State Teachers college at Boone, 54 and 968; Pembroke State College for Indians, 12 and 130; Elizabeth City State Teachers college (for Negroes), 26 and 465; Winston-Salem Teachers college (for Negroes), 22 and 601; Fayetteville State Teachers college (for Negroes), 29 and 693. There were 41 private colleges for whites and Negroes.

Public Welfare, Charities, Correction.—In Oct. 1941 public grants amounting to $393,626 were made to 38,727 persons for old-age assistance, $165,019 to 9,934 families for aid to dependent children, $31,169 to 2,084 blind persons, and $27,960 for general relief (by the county governments). The average monthly volume of unemployment compensation benefits was $266,195 in 1939 and $382,114 in the first half of 1940. On Dec. 9, 1941 WPA employment in the state was 24,228. The state maintained eight charitable institutions with 9,752 inmates in Oct. 1941; five correctional institutions with 853 inmates; and state highway prison camps with 9,048 prisoners.

Communication.—In 1941 the state highway and public works commission maintained 11,298 mi. of state highways, of which 9,583 mi. were hard-surfaced, and 47,642 mi. of county roads, of which 1,824 mi. were hard-surfaced. There were 4,596 mi. of railroads, 495 mi. of city bus routes, 6,223 mi. of passenger bus routes and 6,753 mi. of freight vehicle routes. There were in operation across the state one east-west and two north-south airways.

Banking and Finance.—On June 30, 1941, there were 44 national banks with deposits of $138,803,000, loans of $55,355,000 and investments of $28,412,000; and there were 184 state banks with deposits of $454,714,000, loans of $162,189,000 and investments of $141,909,000. In 1940 there were 160 building and loan associations with total assets of $90,680,929.81. In 1940–41 state receipts were $155,534,983; disbursements, $146,847,207. On June 30, 1941, the state gross bonded and net debts were $141,536,500 and $122,768,025, respectively. The assessed value of property was $2,394,236,806 in 1940.

Table I.—*Leading Agricultural Products of North Carolina, 1941 and 1940*

Crop	1941	1940
Tobacco, lb.	465,235,000	524,185,000
Cotton, bales	556,000	739,000
Corn, bu.	52,006,000	47,600,000
Tame hay, tons	1,071,000	1,026,000
Peanuts, lb.	284,400,000	366,800,000
Wheat, bu.	7,110,000	6,645,000
Sweet potatoes, bu.	6,880,000	7,178,000
Irish potatoes, bu.	6,636,000	8,720,000
Oats, bu.	6,300,000	5,875,000
Soybeans, bu.	1,710,000	1,020,000
Lespedeza seed, lb.	28,500,000	23,400,000
Peaches, bu.	2,760,000	1,344,000
Apples, bu.	1,365,000	962,000
Pecans, lb.	1,400,000	993,000

Table II.—*Principal Industries of North Carolina, 1939 and 1937*

Industry	Value of products	
	1939	1937
Textile products	$540,741,388	$496,420,367
Cigarettes	532,439,765	536,915,093
Food products	69,205,628	51,058,740
Furniture and finished lumber products	62,775,741	56,200,035

Table III.—*Principal Mineral Products of North Carolina, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Stone	$4,850,277	$6,979,426
Clay products	...	4,761,867
Sand and gravel	1,430,457	1,101,369
Feldspar	426,784	397,631
Mica	301,481	253,721
Talc and pyrophyllite	298,382	283,780

Agriculture.—The total value of agricultural production harvested from an acreage of 6,399,400 was approximately $300,000,000 in 1941. The cash income of North Carolina farmers in 1940 was $168,301,000 from crops, $36,684,000 from livestock and $14,876,000 from government payments. The value of the lands and buildings on the 278,276 farms, 44% of which were operated by tenants, was $736,708,125. Despite severe spring drought and excessive summer rains, 1941 was a better than average crop year. (*See* Table I on page 487.)

Manufacturing.—In 1939 manufacturing establishments numbering 3,225 employed 270,210 wage earners at wages of $199,289,501 and made products valued at $1,421,329,578. (*See* Table II on page 487.)

Mineral Production.—The mineral production for North Carolina in 1940 was valued at approximately $20,000,000. (*See* Table III on page 487.)

BIBLIOGRAPHY.—*Public Laws of N.C.*, 1941; U.S. Census; *Minerals Yearbook. Review of 1940;* reports of state agencies. (A. R. N.)

North Dakota. A west north central state of the United States, popularly known as the "Flickertail state." Area, 70,054 sq.mi.; pop. (1940) 641,935. The rural population was 510,012; urban, 131,923. Capital, Bismarck (15,496). The chief cities are Fargo (32,580); Grand Forks (20,228); and Minot (16,577).

History.—On the boundary line between North Dakota and Canada, in the region known as Turtle mountains, a park of 3,000 acres called the International Peace garden was established in 1941 to commemorate the long-continued peace between Canada and the United States. The chief officers of the state in 1941 were as follows: governor, John Moses; lieutenant governor, Oscar W. Hagen; secretary of state, Herman Thorson; state auditor, Berta E. Baker; state treasurer, Carl Anderson; attorney general, Alvin C. Strutz; commissioner of insurance, Oscar E. Erickson; commissioner of agriculture and labour, Math Dahl.

Education.—Elementary schools in 1940 numbered 3,996; enrolment 105,734; teaching staff 6,143. Secondary schools numbered 181; enrolment 33,895; teaching staff 1,218. Institutions of higher learning are the state university and school of mines, the agricultural college, three state teachers colleges, two normal schools, a school of forestry and a school of science. The total enrolment in these institutions in 1941 was 6,600, and their teaching staffs numbered 445.

Public Welfare, Correction.—The WPA during the fiscal year ending June 30, 1941, expended $7,254,375 of federal funds and employed an average of 10,534 persons per week. The number of correctional institutions in 1941 was five. The average number of inmates was 2,645; the cost of maintenance was $1,031,835.

Communication.—Mileage of state highways on Jan. 1, 1941, was 7,342; of rural highways on Jan. 1, 1937, 110,053. State expenditures of the highway department for the year ending June 30, 1940, were $4,677,361. The total railway mileage in the state in 1941 was 5,269.92.

Banking and Finance.—In 1941 there were 115 state banks and one trust company, with resources of $35,637,947.34 and deposits of $19,931,722.00. There were 23 savings and loan associations with resources of $12,466,382. For the year ending June 30, 1941, state receipts were $41,970,988.01, and expenditures were $31,759,278.36. The bonded indebtedness of the state was $21,643,000. New state capitol building indebtedness was $270,000.

Agriculture.—The total farm acreage harvested in 1941 was 13,773,109. The cash income from crops and livestock was $341,352,977, and the benefit payments amounted to $22,224,000. Value of livestock (1941) was $118,413,697. The average rainfall (23.23 inches—6.35 inches above normal and the highest on record) made 1941 a good crop year and had an excellent effect on pastures and ranges.

Table I.—*Leading Agricultural Products of North Dakota, 1941 and 1940*

	1941	1940
Wheat, bu.	111,960,000	69,972,000
Durum, bu.	34,238,000	27,082,000
Corn, bu.	24,670,000	24,480,000
Oats, bu.	58,575,000	33,432,000
Barley, bu.	43,675,000	28,064,000
Rye, bu.	13,516,000	9,776,000
Flax, bu.	4,576,000	3,888,000
Potatoes, bu.	14,155,000	18,920,000

Manufacturing.—The total value of manufactures in 1939 was $43,767,082, and the total employment was 3,435. The principal industries and the value of their products were creamery butter, $12,894,964; flour and grain mill products, $5,303,788; publishing and printing, $2,255,874.

Mineral Production.—For the year ending July 1, 1941, the production of lignite coal was 2,347,258 tons, valued at $2,714,872. The total value of mineral production in 1939 was $2,689,627; in 1938 it was $2,653,473.

Table II.—*Principal Mineral Products of North Dakota, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Coal	$2,425,000	$2,380,000
Sand and gravel	128,279	151,824
Natural gas	29,000	27,000

(O. G. L.)

Northern Ireland: *see* IRELAND, NORTHERN.

Northern Rhodesia: *see* RHODESIA.

Northern Territory OF AUSTRALIA. Area 523,620 sq.mi.; pop. (June 30, 1940): aboriginals, full-blooded, 13,901; half-caste, 902; white (est. Dec. 31, 1940), 8,852.

Darwin is a key strategic point in the defenses of the commonwealth. During 1941 the garrison was considerably strengthened and important works in connection with both sea and land defenses were carried out.

Finance.—Revenue (1940–41), actual, £A157,042; from Central Australia railway (1940–41), £A243,702; from North Australia railway (1940–41), £A181,414. Expenditure, ordinary appropriation (1940–41), £A462,172.

Communication.—Work on the construction of the 625 mi. of strategic road from Alice Springs to Birdum was completed early in 1941, and the federal cabinet then decided on plans for a connecting road to Mount Isa in western Queensland. A survey was made and an all-weather highway was under construction, the junction being at Tennant's Creek.

Agriculture, etc.—Production in 1939–40: Pastoral industry, £A587,821; gold, £A233,789; wolfram, £A47,836; pearl shell, £A15,998. Railways, government (Dec. 31, 1939), 508 mi. (W. D. MA.)

Northwestern University. An institution of higher learning at Evanston and Chicago, Ill. The university comprises the following divisions: the college of liberal arts, the graduate school and the schools of engineering, music, education, speech, commerce and journalism, all located in Evanston (suburb of Chicago) on a campus bordering Lake Michigan; the medical, law and dental schools and the evening departments of the university, all on Chicago's near north side, on a campus six blocks from the loop business district. The enrolment of the university for the first semester of 1941–42 consisted of 6,137 full-time students, of whom 4,971 were registered on the Evanston campus; and 9,033 part-time and evening students, most of whom were registered on the Chicago campus. The 1941 summer session had an enrolment of 4,855 students. The faculty of the university, including demonstrators and assistants, totalled 1,380.

The total of gifts for the fiscal year ending Aug. 31, 1941 amounted to approximately $2,072,000, including a bequest from Mrs. Emma H. Morrison of $1,500,000.

During 1941 construction was completed on two new buildings on the Evanston campus—Lutkin Memorial hall, an auditorium for the school of music, and the $5,000,000 Technological institute building. On the Chicago campus the 20-story Wesley Memorial hospital was completed.

The Naval Midshipmen's school on the Chicago campus graduated during the year 2,136 men, who were commissioned as ensigns in the U.S. naval reserve. On the Evanston campus the naval R.O.T.C. maintained an enrolment of 300 men, civilian pilot training was given to 150 students, and approximately 800 men were enrolled in technological defense courses.

Northwest Territories. The Northwest Territories of Canada comprise the territories formerly known as Rupert's land and the Northwestern territory, except such portions thereof as form the provinces of Manitoba, Saskatchewan and Alberta and the Yukon territory, together with all British territories and possessions in North America and all islands adjacent thereto, not included within any province, except Newfoundland and its dependencies. The Northwest Territories are governed by a commissioner, deputy commissioner and five councillors appointed by the governor general in council. Area, 1,309,682 sq.mi.; pop. (1941 census) 10,661. Seat of government, Ottawa.

Trade and Communication.—The main activities are the fur trade and the mining industry. Furs to the value of approximately $1,325,000 are exported annually. Natives and half-breeds living the life of natives enjoy free hunting and trapping rights, and an area of 609,877 sq.mi. has been set

aside as native game preserves. Only those white men who qualify under the residence regulation are able to purchase hunting and trapping licences. Fur trading is controlled by regulation and only those who have established permanent posts are able to engage in the fur trade.

Two well organized transportation companies maintain regular boat service for both passengers and freight. Regular and frequent commercial air service connects Edmonton, Alberta, with the Mackenzie district and carries mail. The eastern arctic is served by a yearly supply ship from Montreal and smaller boats operating from Churchill. Strategically placed government radio stations, supplemented by sets operated by trading companies, maintain wireless communication with centres of population in the provinces.

Mineral Production.—Mining in 1941 was confined mainly to the Yellowknife area, where the output of gold on a commercial basis commenced with the pouring of the first gold brick at the Con property of the Consolidated Mining and Smelting Company of Canada, Ltd., on the west side of Yellowknife bay, in Sept. 1938. By 1941 four other properties had come into production, namely, Negus Mines, Ltd., Slave Lake Gold Mines, Ltd., Thompson Lundmark Gold Mines, Ltd., and Rycon Mines, Ltd. The total value of gold produced in 1938–41 from these five properties exceeded $7,000,000. The largest producer has been the Con mine, which by 1941 had contributed more than $4,100,000. From the Negus mine more than $2,000,000 had been produced. The Ptarmigan Mines, Ltd. was installing a mill in 1941 and expected to go into production early in 1942. It was also reported that the Eldorado Gold Mines, Ltd. would resume, in the spring of 1942, mining of their valuable and extensive radium-bearing ore deposit at Great Bear lake, which was discontinued in 1940 after several years of successful production. (R. A. G.)

Norway. A country of northern Europe. Bounded N. by the Arctic ocean, E. by Finland and Sweden, S. and W. by the North sea. Area 124,556 sq.mi.; pop. (est. 1939) 2,921,000. Capital, Oslo (253,124). Other principal cities, with 1930 populations, are Bergen (98,303); Trondhjem (54,458); and Stavanger (46,780). Religion, Lutheran Christian. Ruler in 1941: King Haakon VII (*q.v.*). Prime Minister: Johan Nygaardsvold (in exile in London). Norway was occupied by Germany in 1940, and was administered in 1941 through Reichscommissar Josef Terboven.

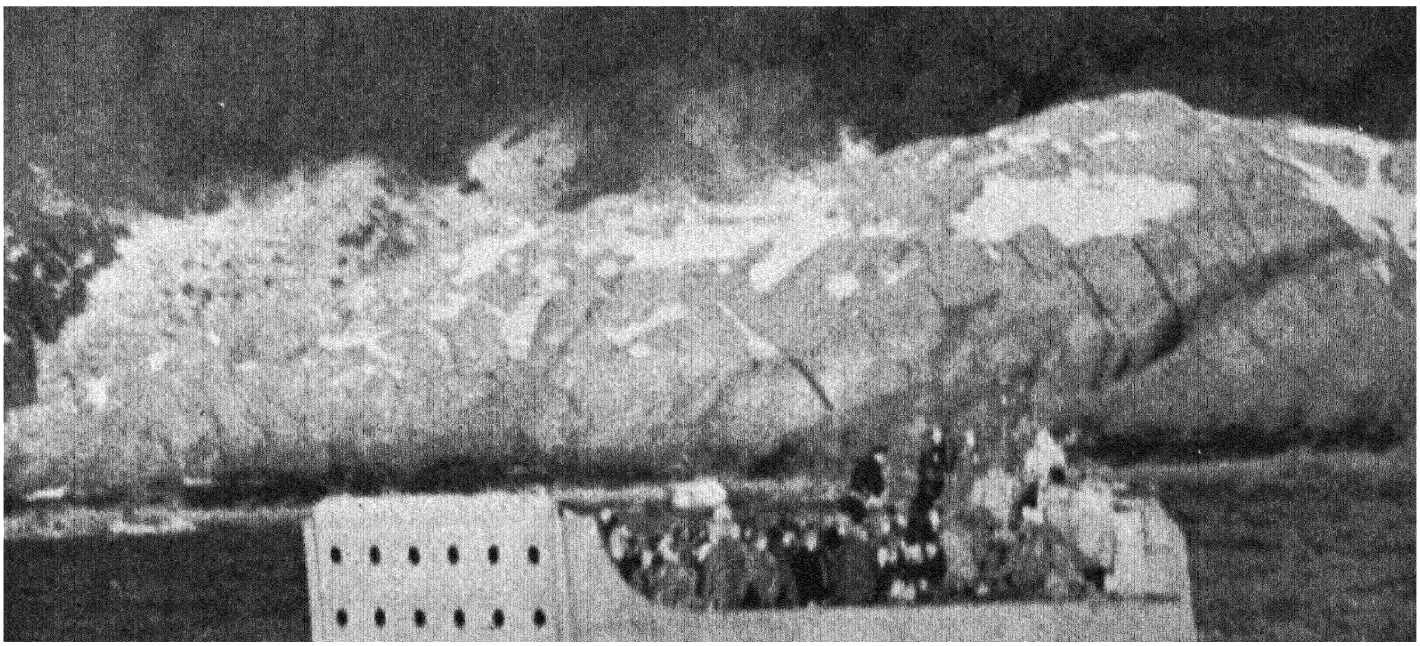
History.—Norway was at war in 1941—internally by sabotage and other forms of civil resistance, elsewhere by well planned action under the royal government in London. Early in August the German authorities declared "a state of siege" in Norway, and in the weeks that followed they made thousands of arrests and executed unknown numbers of opponents of the nazi regime. Radios were ordered surrendered; blankets, heavy clothing, knapsacks, skis, skiboots and large quantities of food were requisitioned. Demands for items such as apples, potatoes and fish were so heavy that a shortage of fish was foreseen for the first time in Norwegian history. Reichscommissar Terboven issued also a statement saying that "persons who display laziness, carelessness or stubbornness, and who do not perform worthy labour, shall not participate in the distribution of necessities and luxuries of life in the same degree as those who co-operate whole-heartedly."

Seemingly reliable figures indicated that by July 1, 1941 the Germans had already taken from Norway 1,277 tons of coffee, 133 tons of eggs, 5,819 tons of butter and margarine, 5,108 tons of milk and 1,166 tons of cheese. The food requirements of some 300,000 soldiers and large numbers of wounded sent into the country from Germany indicated that the "non-co-operating" portion of the population would have to eat meagrely. By March 1 the Bank of Norway had paid to the occupying authorities 1,600,000,000 kr., and continued to pay at the rate of 150,000,000 kr. per month. Fines laid upon recalcitrant communities increased the financial burden. In other ways, too, the yoke was heavy—no hunting licences were issued except upon recommendation of the Nasjonal Samling (the nazi Quisling party). Workers were prohibited from changing jobs without permission.

Opposition grew. Clashes between populace and authorities increased, and executions and arrests fanned the flames. Forty-three labour and professional organizations joined in one common protest. In Dec. 1940 the supreme court had resigned in protest against arbitrary changes, and the lawyers of the country supported the court's position. The clergy came out in a strong statement against the brutality of the regime, and some 98% of the ministers consistently opposed nazi decrees. When R.A.F. bombers appeared, the people cheered and sang "Tipperary" instead of running to shelters. Informers along the coast were able to get word to the British about such German ship movements as the sailing of the "Bismarck". It appeared that perhaps 99% of the people continued to reject the "new order" in 1941, though at the end of the year a new attempt was being made to force the schools to teach totalitarian doctrines at least one half hour each week. That requirement seemed mild indeed, compared with others, and was an indication both of frustration and opposition met by the nazis and of their strenuous efforts to get some sort of co-operation.

The British kept the nationalistic hope alive by the daring Commando raids, especially those on the Lofoten islands (March 4 and Dec. 26). At other points too, such as Vaagsoey and Maaloey, these quick-acting raiders destroyed German matériel and captured nazi and Quisling soldiers and sympathizers. The Germans imposed punishment by fines and imprisonments, but hundreds of Norwegians joined the Commandos, went to England and prepared to return on similar expeditions. In Canada an air force

IN A RAID on Norway's Lofoten islands, carried out with armoured "invasion barges" March 4, 1941, the British blew up oil tanks and withdrew with 215 German prisoners and 323 Norwegians



of young Norwegians, many of whom had escaped in small boats via the fjords of Norway and across to England, was in training.

Most important of all in the larger struggle was the activity of the Norwegian merchant fleet, one of the world's largest (4,835,000 gross tons in 1939), some 80% of which had eluded Hitler's grasp. The modern tankers were of great help in carrying to England more than 50% of her gasoline and oil. This fleet took to England also about one-third of her foodstuffs and munitions. About 2,000 of the 30,000 Norwegian sailors had died in action by the end of 1941; 234 Norwegian ships had been sunk since 1939, but 830 were left. United under the control of the Norwegian shipping and trade mission, this fleet was the largest single group of merchant ships afloat.

Within Norway itself trade was down 50 to 65%, and the cost of living (with Jan.–June 1914 as the base of 100) had risen without interruption from 159 in 1939 to 251 in Sept. 1941.

Diplomatically the Norwegian government-in-exile threw her whole weight with Britain and the United States. Therefore, on Dec. 7, this government broke off relations with Finland, and on Dec. 9 broke with Japan.

Education.—In 1937–38 there were 357,793 students and 10,521 teachers in the elementary schools; 31,127 students and 1,809 teachers in the middle schools and gymnasia, and 16,033 students in continuation schools. The 11 universities had a combined enrolment of 4,998. The Norwegian state in 1937–38 spent on higher education 7,105,000 kr.; universities also received 2,055,000 kr. from other sources. The total state budget for educational purposes in 1939–40 was 65,364,000 kr. Local districts provided more than half the funds for elementary education.

Defense.—The budget for 1939–40 was 54,762,000 kr.; Jan.–June 1941 (by govt. in London), 21,385,543 kr.

Army. Under the law in force in 1940, compulsory service began at age 20, extended for 12 years in the regular army and 12 years in the "Landvaern." About 30,000 men became liable annually, and served a training period of 84 days. In 1935 permanent personnel included 1,135 officers, 765 noncommissioned officers and men.

Navy. The navy on Jan. 1, 1941 had two coast-defense ships, 16 torpedo boats and 6 submarines. By the end of 1941 it was claimed this strength had been increased, largely by the use of some of the over-age U.S. destroyers.

Finance.—The monetary unit is the krone (23.4 U.S. cents in 1939). Budgetary income and expenses for 1937–38 balanced at 572,135,000 kr.; the proposed budget of 1939–40 was 595,627,000 kr. The government in London planned expenditures of 142,827,636 kr. in the first six months of 1941. The state debt Dec. 31, 1938 was 1,430,395,000 kr.

On Dec. 31, 1938 the Norges bank had capital of 35,000,000 kr. and deposits of 130,643,000 kr.; 711 private and savings banks had deposits of 2,928,000,000 kr.

Trade.—In 1939 exports were valued at 808,172,000 kr.; imports, 1,361,835,000 kr. The imports rose rapidly in the last three months, while Norway built up stocks for the war period. Trade in 1940 and 1941 was badly disrupted, especially by the cutting off of ties with Great Britain, with which Norway formerly did about 25% of her total trade. Norway's chief imports were boats, machines, minerals, textiles, petroleum, rubber and metals; the chief exports were wood pulp and products, metals and meat.

Communication.—In 1939 there were 2,335 mi. of state railways and 25,677 mi. of highways (11,857 mi. improved, 13,820 unimproved). In 1938 there were 107,657 motor vehicles. Norwegian air lines flew a total of 85,000 mi. in 1938. Telephones numbered 122,664; telegraph lines extended 21,875 mi.; radio receivers (licensed) numbered 400,623.

Agriculture.—The total value of agricultural products in 1938 was 384,207,000 kr.; of animal products (eggs, milk, wool, etc.), 428,000,000 kr.; furs, 30,000,000 kr. Landholdings numbered 562,407 (298,360 operating units) with a value of 2,410,101,000 kr. Leading crops were wheat (15,791,000 kr.), rye (2,197,000 kr.), barley (22,382,000 kr.) and oats (31,479,000 kr.). In 1938 total productive forest area was one-quarter of the total land area, or 18,700,000 ac.

Fisheries.—The total catch of fish in 1937 was 903,646 tons, the value of which was 92,272,000 kr.; 523,000 tons of the total was herring of various kinds.

Manufacturing.—In 1937 there were 4,306 establishments which turned out products valued at 2,023,551,000 kr. According to value of the product, the most important industries were food and tobacco (411,109,000 kr.), paper, cellulose (309,733,000 kr.), iron and metal (308,169,000 kr.), mining (216,511,000 kr.), textile (144,488,000 kr.), and wood, furniture, etc. (140,756,000 kr.).

Mineral Production.—In 1938 the principal mineral product was iron ore, valued at 26,665,000 kr. Pyrites, valued at 18,168,000 kr., and copper, valued at 5,013,000 kr., were respectively the second and third minerals.

(F. D. S.)

Nose: *see* EAR, NOSE AND THROAT, DISEASES OF.

Notre Dame, University of.

An institution of higher learning at Notre Dame (South Bend), Ind.

A unit of the Naval R.O.T.C. was established on the campus in September. December, 1941, brought rumours of expansion of naval training facilities and a lengthening of the school year in conformity with a general college trend. One out of every 25 Notre Dame men was already in service. The university in 1941 had night defense courses, the N.R.O.T.C., civilian pilot training, four chaplains from the Congregation of Holy Cross and a number of faculty members and employees in the service. Further defense efforts were being co-ordinated rapidly.

William T. Walsh, Larchmont, N.Y., author and educator, was the 1941 Laetare medalist.

Former Ambassador Joseph P. Kennedy, elected a trustee of Notre Dame in 1941, and Monsignor Fulton Sheen headed a memorable 1941 commencement program. A forum in economics and a similar political forum were held at the same commencement for alumni. The fifth annual mathematics colloquium was held in February and March. Plans for observance of the university's centenary, set for September 1942 to September 1943, continued, subject to emergency measures.

Enrolment for the 100th academic year, 1941–42, was 3,197, including off-campus and graduate students. The 24th, and perhaps last, summer school enrolled 1,103 students in 1941. Under a proposed revision of the year program, the summer school would not be held.

(J. E. AR.)

Nova Scotia.

One of the four provinces which united to form the Dominion of Canada (*q.v.*) in 1867; area 21,428 sq.mi.; pop. (1941 census) 573,190. Capital, Halifax (69,326). The other cities are Sydney (28,081), centre of the coal, iron and steel industries, and Glace Bay (25,050). The population of the province is 97% native born, 45% urban. The lieutenant governor in 1941 was F. F. Mather; the premier, A. S. MacMillan.

History.—An election held in Oct. 1941 resulted in the return of the Liberal party to power. The party standing after the election was 23 Liberals, 4 Conservatives and 3 members of the Co-operative Commonwealth Federation party. Direct unemployment relief was largely discontinued in 1941 because of the great increase in employment, a result of increased expenditures for war purposes.

Education.—The public school registration in 1941 was 122,210, while there were 3,505 in private schools. The number of teachers was 3,409. Dalhousie university, in Halifax, is a semi-state institution with 851 students and 164 instructors. Acadia university, in Wolfville, had 383 students and 48 instructors in 1941 and St. Francis Xavier university in Antigonish had 365 students and 45 instructors.

Communication.—There were 6,111 mi. of surfaced and 4,278 mi. of earth highways in the province in 1941. The amount spent on highways during the fiscal year 1939–40 was $5,706,882. Railroad mileage was 1,396; number of telephones, 49,157.

Finance.—The provincial receipts in the fiscal year 1940–41 were $16,443,946; expenditure $15,497,608. The gross debt was $101,733,513; net debt $93,943,805.

Agriculture.—The acreage under cultivation was 556,700 in 1941, and the value of crops grown thereon $28,803,000, yielding a cash income of $23,751,000.

Table I.—*Leading Agricultural Products of Nova Scotia, 1941 and 1940*

Crop	1941	1940
Oats, bu.	3,265,000	3,325,000
Turnips, cwt.	3,511,000	3,090,000
Potatoes, cwt.	2,319,000	2,033,000
Hay and clover, tons	649,000	605,000

Manufacturing.—The value of manufactures in 1939 was $83,139,572. Employees numbered 17,627 and wages amounted to $16,651,685.

Table II.—*Principal Industries of Nova Scotia, 1938 and 1937*

Industry	Value of products	
	1938	1937
Steel works	$11,183,267	$14,883,039
Fish packing	6,471,510	6,308,091
Pulp and paper	5,933,523	4,944,848
Railway rolling stock	3,246,033	6,707,720
Sawmills	3,013,284	3,238,037

BIBLIOGRAPHY.—*The Royal Gazette; Report of the Duncan Commission; Canada Year Book, 1941.*

(J. C. HE.)

Noyes, William Albert (1857–1941), U.S. chemist, was born Nov. 6, near Independence, Ia., and was educated at Iowa (now Grinnell) college and at Johns Hopkins university, where he received his Ph.D. degree in 1882. He was chemistry professor at the University of Tennessee, 1883–86, and at Rose Polytechnic institute, 1886–1903. He was chief chemist of the government's national bureau of standards, 1903–07, and chemistry professor and director of the University of Illinois chemical laboratory from 1907 until his retirement in 1926. Noyes was one of the leading scientists in the United States in atomic weight research. He was awarded the Nichols medal, 1908; the Willard Gibbs medal, 1919; and the Priestley medal of the American Chemical society, 1935. In collaboration with his son, W. A. Noyes, Jr., he wrote *Modern Alchemy* (1932). He died at Champaign, Ill., Oct. 24.

Nursery Schools: *see* EDUCATION: *Nursery Schools.*
Nutmegs: *see* SPICES.
Nutrition: *see* DIETETICS; MEDICINE.

Nuts. Of the four varieties of nuts grown commercially in the United States two—walnuts and filberts—showed increased production in 1941, while the total crop of pecans was 84,759,000 lb., compared with 88,426,000 lb. in 1940, and the 1941 almond crop was one of the smallest on record. As of Nov. 1, the department of agriculture reported the walnut crop as follows: California, 53,000 tons (1940: 42,200 tons; 10-year average: 43,330 tons); Oregon, 6,300 tons (1940: 4,200 tons; 10-year average: 2,655 tons).

Filbert production in Oregon for 1941 broke all previous records. The department of agriculture report on the filbert crop was: Oregon, 4,200 tons (1940: 2,700 tons; 10-year average: 1,321 tons); Washington, 830 tons (1940: 510 tons; 10-year average: 242 tons).

The 1941 almond crop of the United States, grown only in California, was one of the smallest on record: 6,000 tons compared with 10,200 tons in 1940 and a 10-year (1930–39) average of 13,720 tons. The almond crop, the department of agriculture reported, was almost a complete failure in the important Sacramento valley counties, where many trees were either killed or severely damaged by excessive winter and spring rains.

The pecan crop, grown commercially in 12 states, was estimated in 1941 as 25,799,000 lb. of improved varieties, compared with 20,446,000 lb. in 1940 and a 10-year average of 17,710,000 lb. The 1941 crop of wild or seedling varieties was 58,960,000 lb., compared with 67,980,000 lb. in 1940 and a ten-year average of 46,966,000 lb.

The United States imports about $14,000,000 of edible nuts annually, Brazil nuts constituting the largest variety. Cashew nuts also occupy an important place in such imports and increased in the year ending June 30, 1941, to 16,514 short tons, from 12,686 short tons the preceding year—practically all from India. From Brazil, 101 short tons of cashew nuts were imported in 1941 compared with none the preceding year; from countries other than Brazil and India, 13 short tons in 1941 and 80 in 1940. Reports of nut production from other countries were fragmentary. The 1941 almond crop of Spain was reported as 22,000 short tons (shelled basis), almost double the 1940 crop; filberts, 20,000 short tons (unshelled basis) in 1941, a decrease of about 10% from 1940. Filbert production in 1941 in Italy was reported as 30,000 short tons compared with a ten-year average of 23,400 short tons; Turkey, 27,500 short tons in 1941 and a ten-year average of 57,600 short tons (all on unshelled basis). (*See* also COCO-NUTS; PEANUTS.) (S. O. R.)

U.S. Pecan Production in Leading States, 1941 and 1940
(Improved varieties)

State	1941 lbs.	1940 lbs.	State	1941 lbs.	1940 lbs.
Georgia	9,497,000	7,929,000	Texas	1,925,000	2,870,000
Alabama	3,899,000	2,041,000	Florida	1,348,000	1,155,000
Mississippi	3,294,000	1,331,000	South Carolina	1,282,000	1,152,000
Oklahoma	2,100,000	1,556,000	North Carolina	984,000	715,000

(Wild or Seedling Varieties)

State	1941 lbs.	1940 lbs.	State	1941 lbs.	1940 lbs.
Oklahoma	28,000,000	20,674,000	Louisiana	2,362,000	3,205,000
Texas	19,465,000	38,130,000	Missouri	800,000	392,000
Arkansas	3,362,000	2,525,000	Georgia	715,000	507,000
Mississippi	2,695,000	1,386,000	Alabama	433,000	178,000

NWLB (National War Labor Board): *see* DEFENSE MEDIATION BOARD, NATIONAL.
NYA: *see* NATIONAL YOUTH ADMINISTRATION.
Nyasaland: *see* BRITISH EAST AFRICA.

Nye, Archibald Edward (1896–), British soldier, one of the few British officers to rise from the ranks to a high command, was entered by his father in the Duke of York's Military school at Dover, where the sons of noncommissioned officers are trained for the services. He entered the army in 1914, served two years in World War I as a private, and won a commission. After the armistice he held a staff appointment at the war office and studied measures to coordinate the army and the R.A.F. for battle purposes. Soon after the outbreak of World War II he was promoted to brigadier general, and in 1940 he was advanced to major general. Gen. Nye was appointed vice-chief of the British imperial general staff Nov. 18, 1941, and a month later he accompanied Foreign Secretary Anthony Eden on a secret mission to Moscow.

Oats. Production of oats in the United States in 1941 was estimated by the department of agriculture Nov. 1 as 1,138,843,000 bu., about 8% less than the 1940 crop of 1,235,628,000 bu., but 13% more than the ten-year (1930–39) average of 1,007,141,000 bu. The acreage for harvest in 1941 was 37,236,000 compared with 34,847,000 ac. in 1940 and a ten-year average of 36,487,000 ac. The per-acre yield was 30.6 bu. in 1941 and 35.5 bu. in 1940, the highest on record. The ten-year average yield was 27.3 bu. per acre. In Canada the acreage planted to oats was substantially increased in 1941 because of the sharp curtailment in wheat planting. The Canadian acreage in oats in 1941 was 9,308,000 ac.; in 1940 it was 7,818,000 ac., and the five-year average was 8,695,000 ac. Canadian production in 1941, preliminary estimate, was 339,000,000 bu. compared with 404,309,000

U.S. Production of Oats by States, 1941 and 1940

	1941 bu.	1940 bu.		1941 bu.	1940 bu.
Iowa	178,240,000	206,640,000	Colorado	5,408,000	4,530,000
Illinois	147,533,000	152,496,000	Alabama	4,875,000	3,000,000
Minnesota	116,123,000	180,795,000	Wyoming	4,536,000	2,915,000
Wisconsin	75,042,000	96,793,000	Maine	4,294,000	4,520,000
Indiana	55,063,000	49,950,000	California	3,328,000	4,350,000
Nebraska	54,074,000	35,760,000	Arkansas	3,075,000	3,058,000
South Dakota	53,200,000	53,240,000	Virginia	2,415,000	1,932,000
North Dakota	51,264,000	33,432,000	Tennessee	2,346,000	1,760,000
Ohio	48,981,000	44,880,000	Louisiana	2,130,000	1,984,000
Missouri	47,610,000	48,600,000	Vermont	1,792,000	1,760,000
Michigan	44,200,000	60,480,000	Kentucky	1,722,000	1,400,000
Texas	36,100,000	37,125,000	West Virginia	1,562,000	1,462,000
Kansas	35,152,000	43,596,000	New Jersey	1,485,000	1,419,000
Pennsylvania	31,257,000	31,080,000	Utah	1,386,000	1,073,000
New York	25,620,000	29,966,000	Maryland	1,287,000	1,120,000
Oklahoma	24,920,000	32,269,000	New Mexico	918,000	652,000
South Carolina	11,700,000	10,890,000	Arizona	377,000	297,000
Montana	11,196,000	9,034,000	Nevada	287,000	280,000
Washington	9,990,000	8,658,000	New Hampshire	266,000	280,000
Georgia	9,799,000	8,638,000	Massachusetts	252,000	238,000
Oregon	9,764,000	7,950,000	Connecticut	217,000	210,000
North Carolina	6,500,000	5,052,000	Florida	155,000	126,000
Mississippi	5,724,000	3,776,000	Delaware	120,000	87,000
Idaho	5,494,000	5,106,000	Rhode Island	64,000	60,000

bu. in 1940 and a five-year (1935–39) average of 359,201,000 bu. Other foreign data on oats production were almost entirely absent from trade and other reports in the United States. Canadian shipments of oats to the United Kingdom in the fall of 1941 were much larger than in the same period of 1940. Stocks of oats on United States farms Oct. 1, 1941 were about 10% smaller than the stocks of 1,026,452,000 bu. Oct. 1, 1940, the largest on record at that date. (*See* also CEREALS.) (S. O. R.)

Obituaries.

The following is a list of men and women who died during 1941. An asterisk (*) marks those for whom biographical notices are to be found in regular alphabetical position.

Name	Birth date	Death date
ABBOTT, NATHAN, U.S. educator	July 11, 1854	Jan. 29
ACHESON, ALBERT ROBERT, U.S. mechanical and electrical engineer	Oct. 12, 1882	Feb. 25
ADAMS, ALVA BLANCHARD, U.S. senator	Oct. 29, 1875	Dec. 1
*ADLER, GUIDO, Austrian writer and professor of music	Nov. 1, 1855	Feb. (?)
AFINOGENOFF, ALEXANDER, Russian playwright	1900(?)	Nov. 4(?)
*AGUIRRE CERDA, PEDRO, Chilean statesman	Feb. 6, 1879	Nov. 25
*ALBERTINI, LUIGI, Italian journalist and politician	Oct. 19, 1871	Dec. 29(?)
ALDRICH, GEORGE AMES, U.S. landscape painter	June 3, 1872	Mar. 7
ALDRICH, RICHARD S., U.S. congressman	Feb. 29, 1884	Dec. 25
*ALEXANDER, ROBERT, U.S. general	Oct. 17, 1863	Aug. 26
*ALPHONSO XIII, king of Spain	May 17, 1886	Feb. 28
AMSDEN, CHARLES AVERY, U.S. archaeologist	Aug. 18, 1899	Mar. 3
ANDERSON, JOHN E., U.S. art dealer	1855(?)	July 11
*ANDERSON, SHERWOOD, U.S. author	Sept. 13, 1876	Mar. 8
ANDRADA, DAVID DE COSTA, U.S. singer	Dec. 27, 1865	Jan. 3
APPLEBY, WILLIAM REMSEN, U.S. metallurgist	Feb. 11, 1865	Apr. 8
ARCHER, SAMUEL HOWARD, U.S. Negro educator	1870(?)	Jan. 15
ARMINGTON, FRANK MILTON, Canadian artist	July 28, 1876	Sept. 21
*ARMOUR, ALLISON VINCENT, U.S. yachtsman and scientist	Mar. 18, 1863	Mar. 6
*ARNAULD DE LA PERIERE, LOTHAR VON, German vice-admiral, commander of German naval forces in occupied France	Mar. 18, 1886	Feb. 24
ATWOOD, MILLARD V., U.S. newspaper editor	Aug. 6, 1886	Nov. 3
*AUSTIN, FREDERICK BRITTEN, British author and playwright	May 8, 1885	Mar. 12
*AUSTIN, HERBERT AUSTIN, 1ST BARON, British motor car manufacturer	Nov. 8, 1866	May 23
*BADEN-POWELL, ROBERT STEPHENSON SMYTH BADEN-POWELL, 1ST BARON, founder of Boy Scout movement	Feb. 22, 1857	Jan. 8
*BAER, WILLIAM JACOB, U.S. painter	Jan. 29, 1860	Sept. 22
*BAGBY, ALBERT MORRIS, U.S. pianist and manager of musical artists	Apr. 29, 1859	Feb. 26
BAILEY, JAMES ROBINSON, U.S. organic chemist and educator	Dec. 11, 1868	Mar. 25
BAILLET-LATOUR, COUNT GUY DE, Belgian army officer	1911(?)	Sept. 1
BAKER, ARTHUR MULFORD, U.S. clergyman	Oct. 11, 1880	Sept. 22
BAKER, CHARLES M., U.S. telegraph company executive	1853	May 20
BAKER, NEWMAN FREESE, U.S. educator	Feb. 18, 1898	Sept. 5
BALFOUR, GEORGE, British M.P.	1872	Sept. 27
*BANTING, SIR FREDERICK GRANT, Canadian medical scientist	Nov. 14, 1891	Feb. 21
*BARCLAY, SIR THOMAS, British lawyer	1853	Jan. (?)
BARNARD, JAMES LYNN, U.S. educator	Aug. 9, 1867	Aug. 10
BARRINGER, PAUL BRANDON, U.S. physician, educator and publicist	Feb. 13, 1857	Jan. 9
*BARTET (REGNAULT), JEANNE JULIA, French actress	Oct. 28, 1854	Nov. (?)
BATES, BLANCHE (MRS. GEORGE CREEL), U.S. actress	1873	Dec. 25
*BEARD, DANIEL CARTER, U.S. founder of the Boy Scout movement in the United States	June 21, 1850	June 11
BEARD, JAMES THOM, U.S. civil and mining engineer	Oct. 19, 1855	Dec. 26
BEHAL, AUGUSTE, French chemist	1859	Feb. 4
*BELL, ALEXANDER, British chief of Scotland Yard	1887(?)	July 5
BELL, THOMAS M., U.S. congressman	Mar. 17, 1801	Mar. 18
BELL, WILLIAM HEMPHILL, U.S. admiral	Mar. 3, 1873	Nov. 11
BENJAMIN, GILBERT GIDDINGS, U.S. educator	Dec. 6, 1874	May 28
BENNETT, SIR JOHN R., Newfoundland statesman	Aug. 8, 1866	Oct. 23
*BERENSCHOT, GERARDUS JOHANNES, Dutch commander of Netherlands Indies army	July 24, 1887	Oct. 13
*BERG, ERNST JULIUS, U.S. electro-physicist	Jan. 9, 1871	Sept. 9
BERG, HART O., U.S. engineer	1865(?)	Dec. 9
BERG, IRVING HUSTED, U.S. educator	Mar. 8, 1878	Aug. 29
BERGER, HANS, German discoverer of human electrical brain waves	May 21, 1873	June 9
*BERGSON, HENRI, French philosopher	Oct. 18, 1859	Jan. 4
BERNECKER, ERICH, German general	(?)	Oct. 28
BERRESFORD, ARTHUR WILLIAM, U.S. electrical engineer	July 9, 1872	May 30
BERRY, LEON, U.S. Negro jazz musician	(?)	Oct. 30
*BERTRAND, LOUIS, French novelist, historian and academician	Mar. 20, 1866	Dec. 6
BEST, SIR THOMAS ALEXANDER VANS, British colonial administrator	Oct. 8, 1870	Nov. 24
BEYE, WILLIAM, U.S. steel company executive	July 21, 1881	Oct. 27
*BIBESCO, PRINCE GEORGES VALENTIN, Rumanian aviation pioneer	Apr. 23, 1880	July 3(?)
BICKFORD, WILLIAM PENNINGTON, British clergyman	Sept. 28, 1874	June 12
BIRCHALL, SIR JOHN DEARMAN, British member of parliament	Sept. 26, 1875	Jan. 6
*BIRDSEYE, CLAUDE HALE, U.S. topographic engineer	Feb. 13, 1878	May 30
BIRKHEAD, MAY, U.S. correspondent and fashion writer	1886	Oct. 27
BISHOP, LOUIS FAUGÈRES, U.S. heart specialist	Mar. 14, 1864	Oct. 6
BISSELL, RICHARD MERVIN, U.S. insurance leader	June 8, 1862	July 18
BLACKFAN, KENNETH D., U.S. professor of pediatrics	Sept. 9, 1883	Nov 29
*BLACKTON, JAMES STUART, U.S. pioneer film producer	Jan. 5, 1875	Aug. 13
*BLOCK, PAUL, U.S. newspaper publisher	Nov. 2, 1877	June 22
*BLUMENTHAL, GEORGE, U.S. banker and art collector	Apr. 7, 1858	June 26
BOLE, BENJAMIN PATTERSON, U.S. publisher	Oct. 23, 1873	Nov. 27
BOLLES, STEPHEN, U.S. congressman and newspaperman	(?)	July 8
BONBRIGHT, IRVING WAYLAND, U.S. banker	June 8, 1871	Aug. 1
*BONINE, FRED N., U.S. eye specialist	Oct. 21, 1863	Aug. 22
BOOTHBY, SIR ROBERT TUITE, British banker, director Bank of Scotland	1871	Feb. 7
*BORGLUM, (JOHN) GUTZON (DE LA MOTHE), U.S. sculptor	Mar. 25, 1871	Mar. 6
*BOTANA, NATALIO, Argentinian publisher	1888	Aug. 7
BOTTAZZI, FILIPPO, Italian biologist	Dec. 23, 1867	Sept. 19
BOUTON, ARCHIBALD LEWIS, U.S. educator	Sept. 1, 1872	Apr. 18
BOWERS, LAMONT MONTGOMERY, U.S. business executive	Mar. 7, 1847	June 2
BOWERS, ROBERT HOOD, U.S. composer	May 24, 1877	Dec. 29
BOWES-LYON, LADY MAUDE AGNES, aunt of Queen Elizabeth of Great Britain	1870	Mar. 1
BOWMAN, GEORGE ERNEST, U.S. historian and editor	Jan. 5, 1860	Sept. 6
BRAISTED, WILLIAM CLARENCE, U.S. rear admiral	Oct. 9, 1864	Jan. 17
BRAMSON, LEON, U.S. lawyer and ewish leader	1868(?)	Mar. 2
*BRANDEIS, LOUIS DEMBITZ, U.S. jurist	Nov. 13, 1856	Oct. 5
BRAUN, GEORG, German general	(?)	Nov. (?)
BREWSTER, CHAUNCEY BUNCE, U.S. bishop	Sept. 5, 1848	Apr. 9
BRIDGE, FRANK, British composer and conductor	Feb. 26, 1879	Jan. 11
*BRIDGES, ROBERT ("DROCH"), U.S. editor and author	July 13, 1858	Sept. 2
BRIGGS, SIR CHARLES JAMES, British lieutenant-general	Oct. 22, 1865	Nov. 27
BRIGGS, LLOYD VERNON, U.S. psychiatrist	Aug. 13, 1863	Feb. 28
BROAKER, FRANK, U.S. pioneer writer on accountancy	1863(?)	Nov. 12
BROEDEL, MAX, U.S. medical artist and educator	June 8, 1870	Oct. 26
BROOMELL, I. NORMAN, U.S. educator	Nov. 25, 1858	Mar. 23
*BROWER, GERALD, U.S. colonel	(?)	Apr. 20
*BROWN, CARLETON FAIRCHILD, U.S. educator	July 15, 1869	June 25
BROWN, FRED RADFORD, U.S. army officer, teacher of military science	Feb. 6, 1876	Aug. 30
BROWN, JAMES WALTER, U.S. Negro bishop	July 19, 1872	Mar. 6
*BROWNE, DAME SIDNEY JANE, British nurse	Jan. 5, 1850	Aug. 13
BROWNING, WILLIAM, U.S. neurologist	July 7, 1855	Jan. 5
*BRUSH, GEORGE DE FOREST, U.S. painter	Sept. 28, 1855	Apr. 24
BULLOCK, CHARLES J., U.S. economist and educator	May 21, 1869	Mar. 17
*BURDWAN, SIR BIJAY CHAND MAHTAB, MAHARAJADHIRAJA BAHADUR OF, Indian statesman	Oct. 19, 1881	Aug. 29
BURKE, EDMUND J., U.S. clergyman, educator and economist	1858	Jan. 1
BURR, HENRY (HARRY MCCLASKEY), U.S. ballad singer	Jan. 15, 1885	Apr. 6
BURRETT, CLAUDE ADELBERT, U.S. surgeon and hospital director	July 13, 1878	Mar. 3
*BUSH, WENDELL T., U.S. educator	Sept. 25, 1866	Feb. 10
BYLES, AXTELL J., U.S. oil executive	Oct. 21, 1880	Sept. 28
BYNE, MILDRED STAPLEY, U.S. artist and writer	Dec. 20, 1875	Dec. 24
*BYRAM, HARRY E., U.S. rail executive	Nov. 28, 1865	Nov. 11
BYRON, WILLIAM D., U.S. congressman	Mar. 15, 1895	Feb. 27
CABOT, PHILIP, U.S. educator, banker and economist	Aug. 11, 1872	Dec. 25
CADMAN, JOHN CADMAN, 1ST BARON OF SILVERDALE, British oil industrialist	Sept. 7, 1877	May 31
CAHILL, JAMES A., U.S. theologian and law professor	1859	Oct. 25
CAMMERER, ARNO BERTHOLD, U.S. national park service director	July 31, 1883	Apr. 30
CAMPBELL, PHILIP PITT, U.S. congressman and lawyer	Apr. 25, 1862	May 26
*CAMPINCHI, CESAR, French statesman	May 4, 1882	Feb. 23
*CANDLER, WARREN AKIN, U.S. Methodist bishop	Aug. 23, 1857	Sept. 25
*CANNON, ANNIE JUMP, U.S. astronomer	Dec. 11, 1863	Apr. 13
*CAPERTON, WILLIAM BANKS, U.S. admiral	June 30, 1855	Dec. 21
CAREY, CHARLES HENRY, U.S. lawyer, writer and editor	Oct. 27, 1857	Aug. 26
CARLE, RICHARD (CHARLES NICHOLAS CARLETON), U.S. actor	July 7, 1871	June 28
CARNS, WILLIAM L., U.S. lawyer	Oct. 7, 1875	Sept. 27
CARR, SIR EMSLEY, British publisher	May 1, 1867	July 31
CARROLL, WILLIAM P., U.S. labour adjuster	July 21, 1878	Sept. 26
CARSON, FRANK WESLEY, U.S. newspaper editor	1881	Mar. 10
CASGRAIN, ALEXANDRE CHASE, Canadian lawyer	Apr. 23, 1879	Oct. 27
CEIA, BENVINDO, Portuguese painter	1870(?)	Dec. 5(?)
*CHAFFEE, ADNA ROMANZA, U.S. army officer	Sept. 23, 1884	Aug 22
CHAMBERLAIN, LADY IVY MURIEL, widow of Sir J. Austen Chamberlain	1876(?)	Feb. 13
CHAMBERLIN, HENRY BARRETT, U.S. lawyer and crime commissioner	Mar. 10, 1867	July 7
CHAPIN, CHARLES VALUE, U.S. health officer	Jan. 17, 1856	Jan. 31
CHAPMAN, CHARLES EDWARD, U.S. historian and educator	June 3, 1880	Nov. 18
CHARLES, ROLLIN LANDIS, U.S. professor of physics	Nov. 26, 1885	Dec. 13
*CHEVROLET, LOUIS, U.S. motor car designer, racer and inventor	(?)	June 6
CHOQUETTE, ERNEST, Canadian author	(?)	Mar. 20
*CHRISTIE, LORING C., Canadian minister to U.S.	(?)	Apr. 8
CHRISTINE, HENRI, French composer	1868(?)	Nov. 26
CLARKE, CHARLES LORENZO, U.S. electrical engineer	Apr. 16, 1853	Oct. 9
*CLAUSSEN, JULIA, Swedish opera singer	June 11, 1879	May 1
*CLAY, LAURA, U. S. suffragist	Feb. 9, 1849	June 29
CLELAND, SIR CHARLES, British educator	Apr. 15, 1867	Jan. 19
CLEVELAND, MALCOLM COLBURN, U.S. engineer	Mar. 26, 1877	Oct. 31
*CLIFFORD, SIR HUGH, British colonial administrator	Mar. 5, 1866	Dec. 19
COCHRAN, NEGLEY DAKIN, U.S. newspaper editor	Dec. 20, 1863	Apr. 13
COFFIN, WILLIAM HASKELL, U.S. magazine illustrator and portrait painter	1878(?)	May 12
COGHILL, GEORGE ELLETT, U.S. educator and anatomist	Mar. 17, 1872	July 23
COHN-WIENER, E., German author and scholar	Dec. 25, 1882	Apr. 13
COLBY, C. D. W., U.S. tuberculosis expert	Oct. 23, 1865	Sept. 23
COLGATE, RUSSELL, U.S. industrialist	1873(?)	July 31
COLLIER, NATHAN W., U.S. Negro educator	(?)	Feb. 20
COLLISON, WILSON, U.S. playwright, scenario writer and novelist	Nov. 5, 1893	May 24
CONE, HUTCHINSON INGHAM, U.S. rear admiral	Apr. 26, 1871	Feb. 12
CONNAH, DOUGLAS JOHN, U.S. artist	Apr. 20, 1871	Aug. 23
CONNERY, LAWRENCE JOSEPH, U.S. congressman	Oct. 17, 1865	Oct. 19
*CONRAD, FRANK, U.S. engineer and radio expert	May 4, 1874	Dec. 11
COOK, GEORGE LEANDER, U. S. financier	Oct. 13, 1837	Sept. 27
COOKE-COLLIS, SIR (WILLIAM) JAMES NORMAN, British major general	May 7, 1876	Apr. 14
COOPER, SIR FRANCIS D'ARCY, British industrialist	Nov. 1882	Dec. 18
*COUCH, HARVEY CROWLEY, U.S. utilities executive	Aug. 21, 1877	July 30
COYNE, JOSEPH, U.S. actor	Mar. 27, 1867	Feb.20(?)
CRAWFORD, ROBERT, U.S. producer and music publisher	(?)	Sept. 20
CREIGHTON, JOHN THRALE, U.S. banker and lawyer	July 17, 1884	May 13
CROWTHER, ELIZABETH, U.S. educator	Nov. 15, 1864	Mar. 23
*CSÁKY, COUNT STEPHEN, Hungarian diplomat	1897	Jan. 27

Name	Birth date	Death date
*CUDAHY, EDWARD ALOYSIUS, SR., U.S. meat packer	Feb. 1, 1860	Oct. 18
CUNNINGHAM, FRANK SIMPSON, U.S. business executive	Apr. 16, 1866	Dec. 1
CUSHING, (TOM) CHARLES CYPRIAN STRONG, U.S. playwright	Oct. 27, 1879	Mar. 6
*D'ABERNON, EDGAR VINCENT, 1ST VISCOUNT, British diplomat	Aug. 19, 1857	Nov. 1
DALRYMPLE-HAY, SIR HARLEY H., British inventor	Oct. 7, 1861	Dec. 17
DANFORTH, WILLIAM, U.S. actor	May 13, 1867	Apr. 16
DARNALL, CARL ROGERS, U.S. brigadier general	Dec. 25, 1867	Jan. 18
*DAUGHERTY, HARRY MICAJAH, U.S. politician	Jan. 26, 1860	Oct. 12
DAVAZ, SUAD, Turkish diplomat	Aug. 6, 1878	Aug. 22
*DAVENPORT, EUGENE, U.S. agriculturist	June 20, 1856	Mar. 31
DAVIES, SIR ALFRED THOMAS, British M.P.	July 17, 1881	Nov. 16
*DAVIES, SIR HENRY WALFORD, British organist and composer	Sept. 6, 1869	Mar. 11
DAVIS, HOWARD A., U.S. judge	(?)	Sept. 21
*DAVIS, WILLIAM RHODES, U.S. oil executive	Feb. 10, 1889	Aug. 1
DEAN, JOHN PAUL, U.S. major	Apr. 11, 1897	Apr. 9
DE CORDOVA, RUDOLPH, British actor and dramatist	1859(?)	Jan. 11
DERÈME, TRISTAN (PHILIPPE HUC), French poet and essayist	1889	Oct.26(?)
DERICK, CARRIE MATILDA, Canadian educator and author	Jan. 14, 1862	Nov. 10
DE UGARTE, RAFAEL, Bolivian politician	1871(?)	Nov. 7
*DEVANEY, JOHN PATRICK, U.S. judge	June 30, 1883	Sept. 21
DE VRY, HERMAN A., U.S. manufacturer of motion picture equipment	(?)	Mar. 23
*DINSMORE, CHARLES ALLEN, U.S. educator and clergyman	Aug. 4, 1860	Aug. 14
DOANE, RALPH HARRINGTON, U.S. architect	Oct. 2, 1886	Nov. 6
DOLLY, JENNY, U.S. vaudeville star	Oct. 25, 1892	June 1
*DORMOY, MARX, French socialist leader	1889(?)	July 26
DOWNES, WILLIAM HOWE, U.S. author and critic	Mar. 1, 1854	Feb. 19
*DRIESCH, HANS ADOLF EDUARD, German biologist and philosopher	Oct. 28, 1867	Apr. (?)
DRINKWATER, GEORGE CARR, British architect and portrait painter	July 10, 1880	May (?)
*DUBOIS, EUGENE, Dutch physician and geologist	1858	Feb. (?)
DU BOSE, HORACE M., U.S. Methodist bishop	Nov. 7, 1858	Jan. 15
DUFFIELD, HOWARD, U.S. clergyman	Apr. 9, 1854	Jan. 5
DUNCAN, WALTER JACK, U.S. artist and magazine illustrator	Jan. 1, 1881	Apr. 11
DUNGAN, PAUL BAXTER, U.S. admiral	July 21, 1877	Nov. 27
DUNN, J. ALLAN, U.S. author, journalist and explorer	Jan. 21, 1872	Mar. 25
DUPRE, HON. MAURICE, Canadian statesman	Mar. 20, 1888	Sept. 2
DU PUY, WILLIAM ATHERTON, U.S. journalist and author	Jan. 6, 1876	Aug. 11
DYER, FRANK LEWIS, U.S. mechanical and electrical expert, inventor and writer	Aug. 2, 1870	June 4
EDELSTEIN, M. MICHAEL, U.S. congressman	Feb. 5, 1888	June 4
EDMUNDS, CHARLES W., U.S. educator	Feb. 22, 1873	Mar. 1
*EDWARDS, AGUSTÍN, Chilean statesman	June 17, 1878	June 18
*EIDMANN, FRANK LEWIS, U.S. educator	Dec. 20, 1887	Sept. 4
EILSHEMIUS, LOUIS MICHEL, U.S. artist	Feb. 4, 1864	Dec. 29
ELLIOTT, JOHN CAMPBELL, Canadian politician	July 25, 1872	Dec. 20
*ELLIS, CARLETON, U.S. research chemist and inventor	Sept. 20, 1876	Jan. 13
*ELTINGE, JULIAN, U.S. actor	May 14, 1883	Mar. 7
EMMERSON, LOUIS LINCOLN, U.S. ex-governor of Illinois	Dec. 27, 1863	Feb. 4
EMMET, WILLIAM LE ROY, U.S. electrical engineer and inventor	July 10, 1859	Sept. 26
ENDICOTT, WILLIAM, U.S. railroad executive, banker	1865(?)	Aug. 25
ESCH, JOHN JACOB, U.S. congressman	Mar. 20, 1861	Apr. 27
*EVANS, SIR ARTHUR JOHN, British archaeologist	July 8, 1851	July 11
EVANS, FRANK EDGAR, U.S. brigadier general	Nov. 19, 1876	Nov. 25
EVERITT, GEORGE BAIN, U.S. corporation officer	May 25, 1885	Aug. 2
*EVES, REGINALD GRENVILLE, British portrait painter	1876	June 14
FACKENTHAL, BENJAMIN FRANKLIN, U.S. industrialist	June 2, 1851	Oct. 10
FAIRLEY, EDWIN, U.S. clergyman and educator	Feb. 7, 1864	May 16
FAUTH, PHILIPP, German astronomer	Mar. 19, 1867	Jan. 6
*FEDER, GOTTFRIED, German statesman	Jan. 27, 1883	Sept. 24
FERRARIN, ARTURO, Italian pilot	Feb. 13, 1895	July 18
FIELDING, MANTLE, U.S. architect	Sept. 20, 1865	Mar. 27
*FIELDS, LEW (LEWIS MAURICE FIELDS), U.S. comedian	Jan. 1, 1867	July 20
*FINGER, CHARLES JOSEPH, U.S. author and editor	Dec. 25, 1869	Jan. 7
*FISHER, CLARENCE STANLEY, U.S. archaeologist	Aug. 17, 1876	July 20
*FISHER, FREDERIC JOHN, U.S. manufacturer of automobile bodies	Jan. 2, 1878	July 14
FISKE, JAMES PORTER, U.S. orthopaedic surgeon	Nov. 22, 1866	Oct. 24
FLOWERS, WILLIAM WASHINGTON, U.S. tobacco executive	Nov. 5, 1874	May 1
FOERSTER, ROBERT FRANZ, U.S. educator and economist	July 8, 1883	July 29
FORD, MRS. BLANCHE CHAPMAN, U.S. actress	1850	June 7
FORD, JOHN, U.S. judge	July 28, 1862	July 25
FORD, WILLIAM WEBBER, U.S. bacteriologist	Dec. 15, 1871	Feb. 10
FORD, WORTHINGTON CHAUNCEY, U.S. author and editor	Feb. 16, 1858	Mar. 7
FORREST, ALLAN (EMIL FISHER), U.S. film star	(?)	July 25
FOSTER, JOHN B., U.S. baseball writer	July 16, 1863	Sept. 29
*FOUGNER, G. SELMER, U.S. newspaperman	Aug. 24, 1884	Apr. 2
FRANKLIN, IRENE, U.S. stage and screen star	June 12, 1876	June 16
*FRAZER, SIR JAMES GEORGE, British anthropologist	Jan. 1, 1854	May 7
FRAZER, LADY LILLY, British author	(?)	May 8
FREDMAN, SAMUEL, U.S. rabbi	Mar. 7, 1886	Apr. 14
FRENCH, JAMES J., U.S. clergyman and educator	Apr. 5, 1850	Mar. 6
*FREW, WALTER EDWIN, U.S. banker and financier	July 18, 1864	May 19
FULLER, STUART JAMIESON, U.S. diplomat	May 4, 1880	Feb. 2
*GEHRIG, HENRY LOUIS, U.S. baseball star	June 19, 1903	June 2
GETTY, ROBERT NELSON, U.S. brigadier general	Jan. 17, 1855	Apr. 15
GEYER, LEE EDWARD, U.S. representative	Sept. 9, 1888	Oct. 11
GHERARDI, BANCROFT, U.S. telephone engineer	Apr. 6, 1873	Aug. 14
GILL, WILSON LINDSLEY, U.S. engineer, architect and educator	Sept. 12, 1851	Sept. 12
GILLESPIE, LOUIS JOHN, U.S. chemist and educator	June 10, 1880	Jan. 24
GLASS, ALEXANDER, U.S. industrialist	July 24, 1850	Apr. 18
GOELET, ROBERT WALTON, U.S. corporation director	Mar. 19, 1880	May 2
GOLDMARK, HENRY, U.S. civil engineer	June 15, 1857	Jan. 15
GOODRICH, ARTHUR (FREDERICK), U.S. author and playwright	Feb. 18, 1878	June 26
GOODSELL, CHARLES TRUE, U.S. educator	Mar. 2, 1880	Nov. 25
*GRANGER, WALTER, U.S. explorer and palaeontologist	Nov. 7, 1872	Sept. 7
*GRASER, EARLE W. ("LONE RANGER"), U.S. radio actor	(?)	Apr. 8
GRASSI, EUGENE CINDA, French composer	July 5, 1887	July16(?)
*GRAUERT, ULRICH, German col. gen., air force commander	(?)	May (?)
GREENFIELD, ABRAHAM LINCOLN, U.S. educator	Feb. 15, 1898	July 25
GREGORY, MENAS SARKIS, U.S. psychiatrist, neurologist	1878(?)	Nov. 2

Name	Birth date	Death date
GRESLEY, SIR NIGEL, British railroad engine designer	Apr. 22, 1894	Apr. 5
GREY, CLIFFORD, British lyric writer	Jan. 5, 1887	Sept. 26
GRIERSON, SIR GEORGE ABRAHAM, British linguist	Jan. 7, 1851	Mar. 8
*GRIFFITH, JOHN PRICE CROZER, U.S. pediatrician	Jan. 5, 1856	July 28
GRIMSHAW, ROBERT, U.S. engineer	Jan. 25, 1850	Apr. 9
*GRINDELL-MATTHEWS, HARRY, British scientist and inventor	Mar. 17, 1880	Sept. 11
GROSSI, CAMILLO, Italian general, president of Italian-French armistice commission	Sept. 30, 1876	June 16
GRUBER, L. FRANKLIN, U.S. clergyman and educator	1871(?)	Dec. 5
GUDGER, EMMETT CARLYLE, U.S. navy captain	Feb. 21, 1881	May 10
*GUERTNER, FRANZ, German jurist and politician	Aug. 26, 1881	Jan. 28
*GUGGENHEIM, SIMON, U.S. financier	Dec. 30, 1867	Nov. 2
GUGGENHEIM, WILLIAM, U.S. industrialist and philanthropist	Nov. 6, 1868	June 27
GUGLIELMINETTI, AMALIA, Italian novelist	Apr. 5, 1885	Dec. 4
GULLAND, GEORGE LOVELL, British physician, authority on blood diseases	1862	May 4
*GUNTHER, FRANKLIN MOTT, U.S. diplomat	Feb. 28, 1885	Dec. 22
*HACKETT, HORATIO BALCH, U.S. architect	May 8, 1880	Sept. 8
HAGENBECK, HEINRICH, German circus owner	July 5, 1875	Jan.(?)
HALL, GEORGE WASHINGTON, U.S. psychiatrist and neurologist	June 18, 1869	Oct. 25
*HALL, GROVER CLEVELAND, U.S. editor	Jan. 11, 1888	Jan. 9
HAMMOND, FRANK CLINCH, U.S. gynaecologist	Mar. 7, 1875	Apr. 12
HANUS, PAUL HENRY, U.S. educator	Mar. 14, 1855	Dec. 14
HARBORD, SIR ARTHUR, British M.P.	1865	Feb. 24
HARLAN, EDGAR RUBEY, U.S. historian and Indian authority	Feb. 28, 1869	July 13
*HARRIS, JAMES RENDEL, British scholar	1852	Mar. 1
*HARRIS, SAM H., U.S. theatrical producer	Feb. 3, 1872	July 3
*HARRISON, BYRON PATTON, U.S. senator	Aug. 29, 1881	June 22
HARTMAN, LEE FOSTER, U.S. magazine editor	Oct. 2, 1879	Sept. 23
*HARTY, SIR HERBERT HAMILTON, Irish composer and conductor	Dec. 4, 1880	Feb. 19
HAWKE, SIR JOHN ANTHONY, British judge	1869	Oct. 30
*HAWLEY, WILLIS CHATMAN, U.S. congressman	May 5, 1864	July 24
HAY, EDUARDO, Mexican statesman	Jan. 29, 1877	Dec. 27
*HAYES, SIR BERTRAM FOX, British sea captain and commodore of shipping line	Apr. 25, 1864	May 15
HAYES, SAMUEL W., U.S. jurist	Sept. 17, 1875	Mar. 15
*HAZEN, CHARLES DOWNER, U.S. historian	Mar. 17, 1868	Sept. 18
HEAD, FREDERICK WALDEGRAVE, archbishop of Melbourne	Apr. 18, 1874	Dec. 18
*HECKSCHER, AUGUST, U.S. philanthropist	Aug. 27, 1848	Apr. 26
HEIDEL, WILLIAM ARTHUR, U.S. university professor	Mar. 10, 1868	Jan. 15
HEINZ, HOWARD, U.S. food manufacturer	Aug. 27, 1877	Feb. 9
HENRY, JULES, French diplomat	1889	June 10
HERNE, EDMUND DONALD COLRICK, U.S. radio commentator	Nov. 13, 1889	June 8
HEWLETT, JAMES MONROE, U.S. architect and artist	Aug. 1, 1868	Oct. 18
*HIGGINSON, MARY POTTER THACHER, U.S. poet and author	Nov. 26, 1844	Jan. 9
HILDRETH, STANLEY BARBOUR, U.S. inventor and manufacturer	June 8, 1845	Jan. 12
*HILFERDING, RUDOLF, German statesman	Aug. 10, 1877	Sept. (?)
*HILL, SIR ARTHUR WILLIAM, British botanist	Oct. 11, 1875	Nov. 3
HILL, JOHN BOYNTON PHILIP CLAYTON, U.S. congressman, lawyer	May 2, 1879	May 23
*HILL, ROBERT THOMAS, U.S. geologist	Aug. 11, 1858	July 28
HINCKLEY, ROBERT, U.S. portrait painter	Apr. 3, 1853	June 1
HINDS, ERNEST, U.S. major general	Aug. 18, 1864	June 17
*HINTZE, PAUL VON, German admiral and diplomat	Feb. 13, 1864	Aug. 23
HITCHCOCK, THOMAS, SR., U.S. sportsman	Nov. 12, 1860	Sept. 29
*HOBART, ESTHER JANE TUTTLE, wife of U.S. Vice-President Hobart	Apr. 30, 1849	Jan. 8
*HOBSON, ROBERT LOCKHART, British authority on porcelain and pottery	July 26, 1872	June 6
*HOLLAND, CHARLES THURSTAN, British scientist and radiologist	(?)	Jan. 16
*HOLT, SIR HERBERT SAMUEL, Canadian financier	Feb. 12, 1856	Sept. 28
HOLT, SIR RICHARD DURNING, British ship owner	Nov. 13, 1868	Mar. 21
HOMBERG, OCTAVE, French financier	(?)	July 10
HOOPER, OSMAN CASTLE, U.S. educator	Apr. 10, 1858	May 11
HOPKINS, ALFRED, U.S. architect	Mar. 14, 1870	May 3
*HORGAN, STEPHEN HENRY, U.S. inventor of photoengraving processes	Feb. 2, 1854	Aug. 30
HORN, JOSEPH V., U.S. founder of automat restaurants	1861(?)	Oct. 13
*HOUGHTON, ALANSON BIGELOW, U.S. diplomat	Oct. 10, 1863	Sept. 16
HOVENDEN, MARTHA MAULSBY, U.S. sculptress	May 8, 1884	Feb. 27
*HOVEY, OTIS ELLIS, U.S. civil engineer	Apr. 9, 1864	Apr. 15
*HOXIE, CHARLES A., U.S. inventor	1867	Oct. 13
HUGGINS, WILLIAM L., U.S. jurist	May 14, 1865	May 24
HULING, CAROLINE ALDEN, U.S. author and suffragist	(?)	Mar. 10
HUMPHREYS, FREDERIC ERASTUS, U.S. brigadier general and first army flyer	Sept. 16, 1883	Jan. 20
HUNT, CLYDE DU VERNET, U.S. sculptor	May 31, 1861	Feb. 1
*HUNTZIGER, CHARLES LÉON CLEMENT, French general	June 25, 1880	Nov. 12
*HYMANS, PAUL, Belgian statesman	Mar. 23, 1865	Mar. 8
*HYVERNAT, (EUGENE-XAVIER-LOUIS) HENRY, U.S. orientalist and educator	June 30, 1858	May 29
IDLEMAN, FINIS SCHUYLER, U.S. clergyman	Sept. 12, 1875	Mar. 22
IMES, ELMER SAMUEL, U.S. Negro scientist	1884(?)	Sept. 11
IMLAY, LORIN EVERETT, U.S. electrical engineer	Nov. 2, 1864	June 9
IRWIN, ROBERT, lieutenant governor of Nova Scotia	1865(?)	May 16
ISAACS, NATHAN, U.S. educator	July 10, 1886	Dec. 18
ISRAEL, EDWARD L., U.S. rabbi	Aug. 30, 1896	Oct. 19
JACKSON, DANIEL DANA, U.S. educator	Aug. 1, 1870	Sept. 1
JACKSON, FREDERICK JOHN FOAKES, U.S.-British theologian	Aug. 10, 1855	Dec. 1
*JAMES, ARTHUR CURTISS, U.S. railroad industrialist	June 1, 1867	June 4
JAMESON, ANDREW, Irish distiller and senator	Aug. 17, 1855	Feb. 15
JENSON, ANDREW, U.S. Mormon historian	1851(?)	Nov. 18
JOHNS, GEORGE SIBLEY, U.S. newspaper editor	Dec. 27, 1857	July 16
JOHNSON, ALEXANDER, U.S. social worker	Jan. 2, 1847	May 17
*JOHNSON, AMY, British aviatrix	1903	Jan. 5
JOHNSON, F. M. G., Canadian educator	(?)	Apr. 7
JOHNSON, HOWARD E., U.S. song writer	(?)	May 1
JONES, CHESTER LLOYD, U.S. trade authority, educator and writer	Mar. 6, 1881	Jan. 13
JONES, FREDERICK ROBERTSON, U.S. historical writer and educator	Jan. 4, 1872	Dec. 26

Name	Birth date	Death date
*Jones, Howard Harding, U.S. football coach	Aug. 23, 1885	July 27
Jones, Jefferson, U.S. publisher	Apr. 5, 1891	Nov. 1
Jones, John Joseph, British M.P.	Dec. 8, 1873	Nov. 21
Jonescu, Michael, Rumanian chief of staff	(?)	Sept. 17
*Joyce, James, Irish author and poet	Feb. 2, 1882	Jan. 13
*Just, Ernest Everett, U.S. zoologist	Aug. 14, 1883	Oct. 27
Kabayama, Sukehide, Japanese statesman	July 1868	Mar. 19
Kahn, Gus, U.S. song writer	(?)	Oct. 8
*Kaspar, Karel, Czech cardinal	May 16, 1870	Apr. 21
Kast, Ludwig, U.S. medical research director	Mar. 2, 1877	Aug. 14
*Kelly, Colin P., Jr., U.S. army flier	July 11, 1915	Dec. 10
Kendall, William Mitchell, U.S. architect	Feb. 13, 1856	Aug. 8
Kenmare, 5th Earl of, Valentine Charles Browne, British M.P.	Dec. 1, 1860	Nov. 14
Kernahan, Mrs. Coulson, British novelist	1856(?)	Jan. 17
*Kerrl, Hanns, German minister of religious affairs	Dec. 11, 1887	Dec.14(?)
Kessinger, Albert R., U.S. newspaper editor and publisher	Oct. 15, 1866	Feb. 24
Ketcham, John Clark, U.S. congressman	Jan. 1, 1873	Dec. 4
*Kidd, Isaac Campbell, U.S. admiral	Mar. 26, 1884	Dec. 7
Kienzl, Wilhelm, Austrian composer	Jan. 17, 1857	Oct. 3
Kiest, Edwin John, U.S. newspaper publisher	Sept. 24, 1861	Aug. 11
Kilmer, Aline Murray (Mrs. Joyce Kilmer), U.S. children's writer	Aug. 1, 1888	Oct. 1
Kinnear, Wilson Sherman, U.S. railroad and tunnel engineer	May 25, 1864	Aug. 8
*Kittredge, George Lyman, U.S. educator	Feb. 28, 1860	July 23
Klapka, Otakar, Czech mayor of Prague	(?)	Oct.3(?)
Knapp, Frances Louise, U.S. educator	Apr. 24, 1879	July 31
Kneeland, Elbert Walter, Canadian grain merchant and industrialist	1871(?)	May 20
Koch, Theodore Wesley, U.S. librarian	Aug. 4, 1871	Mar. 23
*Koffka, Kurt, U.S. psychologist	Mar. 18, 1886	Nov. 22
*Korizis, Alexander, Greek banker and statesman	Apr. 15, 1885	Apr. 18
*Kourkoulis, Methodios, Greek church leader in U.S.	Oct. 26, 1862	Apr. 9
*Krause, Allen Kramer, U.S. tuberculosis expert	Feb. 13, 1881	May 12
*Krivitsky, Walter G., former Russian army chief of intelligence	June 28, 1899	Feb. 10
Kyles, Lynwood Westinghouse, U.S. Negro bishop	May 3, 1874	July 19
Ladd, William Palmer, U.S. theologian and author	May 13, 1870	July 1
*Laffoon, Ruby, U.S. politician	Jan. 15, 1869	Mar. 1
Lagergren, Carl Gustaf, U.S. theologian and educator	June 21, 1846	Oct. 27
*Lamberton, Robert Eneas, mayor of Philadelphia, Pa.	Sept. 11, 1886	Aug. 22
Lane, Gertrude Battles, U.S. editor	(?)	Sept. 25
Lane, William J., U.S. manufacturer and inventor	Feb. 3, 1840	Jan. 3
*Langmuir, Arthur Comings, U.S. research chemist	Feb. 7, 1872	May 14
Laning, Harris, U.S. rear admiral	Oct. 18, 1873	Feb. 2
*Lanman, Charles Rockwell, U.S. Sanskrit scholar	July 8, 1850	Feb. 20
*Lapointe, Ernest, Canadian statesman	Oct. 6, 1876	Nov. 26
Lardner, Rex, U.S. journalist	Sept. 3, 1881	June 23
*Lasker, Emanuel, German chess player	Dec. 24, 1868	Jan. 11
*Laughlin, Clara Elizabeth, U.S. travel writer	Aug. 3, 1873	Mar. 3
*Laughlin, Irwin Boyle, U.S. ambassador	Apr. 20, 1871	Apr. 18
*Lauri, Lorenzo, Italian cardinal and chamberlain of the Roman Catholic church	Oct. 15, 1864	Oct. 8
*Lavery, Sir John, British painter	Mar. 1856	Jan. 10
*Lawrence, William, U.S. Episcopal bishop	May 30, 1850	Nov. 6
Lawton, William Cranston, U.S. classical scholar and educator	May 22, 1853	Apr. 18
Learmonth, Sir Frederick Charles, British admiral	Jan. 14, 1866	June 4
*Lebesgue, Henri, French mathematician	1875	Aug.6(?)
*Leblanc, Georgette, French singer and actress	1875	Oct.28(?)
*Leblanc, Maurice, French detective story writer	Dec. 11, 1864	Nov. 6
Lecky, Prescott, U.S. psychologist and lecturer	Nov. 1, 1802	May 30
Ledoux, Urbain J. (Mr. Zero), U.S. benefactor of Bowery's poor	Aug. 13, 1874	Apr. 8
Lee, Auriol, British stage director and actress	Sept. 1883	July 2
Lee, Henry Haworth, U.S. railroad executive	Nov. 3, 1880	July 30
Leech, Paul Nicholas, U.S. chemist and author	Aug. 12, 1889	Jan. 14
Lees-Smith, Hastings Bertrand, British politician	1878	Dec. 18
Leicester, 3rd Earl of, Thomas William Coke, British soldier	July 20, 1848	Nov. 19
Leith, Gordon, British banker	Mar. 10, 1879	Apr. 2
*Leonard, Eddie (Lemuel Gordon Toney), U.S. minstrel and vaudeville star	Oct. 1875	July 29
Le Tellier, Pol, Belgian diplomat	(?)	Aug. 3
*Levinson, Salmon Oliver, U.S. attorney	Dec. 29, 1865	Feb. 2
*Levitzki, Mischa, U.S. concert pianist and composer	May 25, 1898	Jan. 2
*Lewis, Dean De Witt, U.S. surgeon	Aug. 11, 1874	Oct. 9
Lewis, Lucy Biddle, U.S. pacifist and suffragist	1860(?)	Jan. 14
Lewis, Mary Sybil, U.S. opera star	Jan. 7, 1900	Dec. 31
Lieberman, Herman, Polish statesman	1870	Oct. 21
Lincoln, Allen Bennett, U.S. prohibition leader	Aug. 2, 1858	Sept. 1
Lindley, Allen L., U.S. business executive	Sept. 14, 1880	Feb. 28
*Liverpool, Earl of (Arthur William De Brito Savile Foljambe), British peer and first governor general of New Zealand	May 27, 1870	May 16
*Llewellyn, Sir William, British artist	Dec. 1863	Jan. 28
Lloyd, Sir Owen Edward Pennefather, British major general	Jan. 1, 1854	July9(?)
Lloyd George, Dame Margaret, wife of former British prime minister	1863(?)	Jan. 20
*Lloyd of Dolobran, George Ambrose Lloyd, 1st Baron, British statesman	Sept. 19, 1879	Feb. 4
Lobligeois, Felix, French physicist	(?)	Oct. 20
Longstaff, Sir John, Australian portrait painter	Mar. 10, 1862	Oct. 1
Lord, Frederick Taylor, U.S. physician and educator	Jan. 16, 1875	Nov. 4
Louderback, Harold, U.S. judge	Jan. 30, 1881	Dec. 11
*Loudon, Hugo, Netherlands oil executive	1860(?)	Sept. 6
Lovell, Frederick Anthony, U.S. geologist	Dec. 28, 1838	Dec. 13
*Lo Wen-kan, Chinese lawyer and politician	1888	Oct. 16
Lowy, Alexander, U.S. organic chemist	Mar. 31, 1889	Dec. 25
Luckstone, Isidore, U.S. singing teacher and accompanist	Jan. 29, 1861	Mar. 12
Lumpkin, Alva Moore, U.S. judge and senator	Nov. 13, 1886	Aug. 1
Mabon, James Brown, U.S. business executive	(?)	Mar. 10
*McAdoo, William Gibbs, U.S. lawyer and senator	Oct. 31, 1863	Feb. 1
Macaulay, Fannie Caldwell (Frances Little), U.S. author	Nov. 22, 1863	Jan. 6
*McCormick, Harold Fowler, U.S. industrialist	May 2, 1872	Oct. 16
McCune, George Shannon, U.S. Presbyterian clergyman and educator	Dec. 15, 1873	Dec. 5
McCurdy, Charles Albert, British M.P.	Mar. 13, 1870	Nov. 10
McDonald, Angus Daniel, U.S. rail executive	Apr. 14, 1878	Nov. 15
MacDonald, Cordelia Howard, U.S. actress	Feb. 1, 1848	Aug. 8
Macdonell, Sir Archibald Cameron, Canadian lieutenant general	Oct. 6, 1864	Dec. 23
Macdonell, Archibald Gordon, British novelist and journalist	Nov. 3, 1895	Jan. 16
McDougall, Alexander, Canadian major general	Jan. 15, 1878	Feb. 28
MacDowell, William Melbourne, U.S. actor	1856(?)	Feb. 19
McGarry, William James, U.S. theologian and clergyman	Mar. 14, 1894	Sept. 23
McHarg, Henry K., U.S. banker and philanthropist	Feb. 6, 1851	Jan. 28
McKibben, Paul Stilwell, U.S. educator	Mar. 14, 1886	Nov. 11
McKinlay, Whitfield B., U.S. Negro politician	Sept. 15, 1857	Dec. 23
McKinley, James F., U.S. army general	Feb. 22, 1880	Jan. 17
*McLean, Edward Beale, U.S. publisher	1883	July 27
*McNamara, James B., U.S. labour agent	1881(?)	Mar. 8
McNeil, Archibald, U.S. serologist	(?)	Oct. 13
Magnusson, Carl Edward, U.S. college dean and authority on engineering	Sept. 29, 1872	July 10
*Mahmud, Mohammed Pasha, Egyptian politician	1882	Feb. 1
Mailhouse, Max, U.S. neurologist	Feb. 5, 1857	Oct. 19
*Mallory, Clifford D., U.S. shipping executive and yachtsman	May 26, 1881	Apr. 7
*Mallory, Frank Burr, U.S. pathologist	Nov. 12, 1862	Sept. 27
*Mann, Tom, British labour leader	Apr. 15, 1856	Mar. 13
Manson, Phillip, U.S. shipping executive	1877	Oct. 6
*Marchand, Jean, French painter	Nov. 22, 1883	Oct. (?)
Marcoussis, Louis, French cubist painter	(?)	Oct. 24
Marland, Ernest Whitworth, U.S. governor and oil executive	May 8, 1874	Oct. 3
Marshall, Harriet Gibbs, U.S. Negro musician and educator	(?)	Feb. 25
Marshall, John Patten, U.S. musician and educator	Jan. 9, 1877	Jan. 17
Martin, Archer, Canadian judge	May 6, 1865	Sept. 1
*Martin, Frank Lee, U.S. educator	July 7, 1881	July 18
Martinez Nadal, Rafael, Puerto Rican senator	1878	July 6
Marvell, George Ralph, U.S. admiral	Sept. 25, 1860	Nov. 12
*Mascheroni, Edoardo, Italian conductor and composer	Sept. 4, 1859	Mar. 4
Mason, Joseph Warren Teets, U.S. columnist and editor	Jan. 3, 1870	May 13
Massingale, Sam Chapman, U.S. congressman	Aug. 2, 1870	Jan. 17
Más y Prat, José, Spanish author	(?)	Sept. 20
Mather, Alonzo Clark, U.S. philanthropist	1860(?)	Jan. 25
*Mathews, Shailer, U.S. theologian and educator	May 26, 1863	Oct. 23
Maybin, Sir John Alexander, governor of Northern Rhodesia	Aug. 5, 1889	April (?)
Mead, Charles Larew, U.S. bishop of Kansas	July 20, 1868	May 17
Mead, Kate Campbell H., U.S. physician and author	Apr. 6, 1867	Jan. 1
Mee, Walter Raycroft, U.S. church executive	Aug. 21, 1880	Oct. 2
*Menocal, Mario Garcia Menocal y Deop, Cuban statesman	Dec. 16, 1866	Sept. 7
*Merezhkovsky, Dmitri Sergeievich, Russian novelist and critic	Aug. 2, 1865	Dec. (?)
*Metaxas, John, Greek dictator and premier	Apr. 12, 1871	Jan. 29
Meyercord, George R., U.S. manufacturer	May 23, 1875	Feb. 22
Miley, Marion, U.S. golf star	1914(?)	Sept. 28
Millard, Bailey, U.S. editor and author	Oct. 2, 1859	Mar. 20
Mille, Pierre, French author	1864	Jan. (?)
*Miller, Dayton C., U.S. physicist	Mar. 13, 1866	Feb. 22
Million, John Wilson, U.S. college president	Mar. 6, 1863	Sept. 5
Minkowski, Giacomo, Russian composer	June 3, 1873	May 5
Minne, George, Belgian sculptor	1866	Mar. (?)
*Mitchell, Charles Hamilton, Canadian general and educator	Feb. 18, 1872	Aug. 26
*Mochizuki, Keisuke, Japanese statesman	Mar. 1867	Jan. 1
*Moelders, Werner, German war pilot	1913(?)	Nov. 22
Mohler, Henry Keller, U.S. physician and educator	Apr. 2, 1887	May 16
*Monivong, Sisowath, Indo-Chinese monarch	Dec. 27, 1875	Apr. 23
Montague, James Jackson, U.S. newspaperman	Apr. 16, 1873	Dec. 16
Moore, Robert Walton, U.S. congressman and counsellor of state department	Feb. 26, 1850	Feb. 8
Moore, William Emmet, U.S. newspaper editor	June 30, 1878	Dec. 27
*Moran, (John) Léon, U.S. artist	Oct. 4, 1864	Aug. 4
Morgan, Florence Hower, U.S. playwright, editor and author	1853	Jan. 11
*Morgan, Helen, U.S. stage, screen and radio singer	1900(?)	Oct. 8
Morgan, Maud, U.S. harpist	Nov. 22, 1864	Dec. 2
Morgan, Tali Esen, U.S. composer and choral conductor	Oct. 28, 1858	June 30
Morrow, George Keenan, U.S. industrialist	Sept. 10, 1873	May 17
Morton, Ferdinand, U.S. Negro jazz musician	1887(?)	July 10
Morton, James Ferdinand, U.S. museum curator	Oct. 18, 1870	Oct. 7
*Mosca, Gaetano, Italian scholar and political scientist	Apr. 1, 1858	Nov. 9
Mosher, Gouverneur Frank, U.S. missionary bishop of Philippine islands	Oct. 28, 1871	Ju'y 19
Mott, Lewis Freeman, U.S. educator	Sept. 29, 1863	Nov. 20
Moure, Jean G. E., French laryngologist	(?)	Dec. ?
*Mowat, Robert Balmain, British historian	Sept. 26, 1883	Sept. 1
*Muir, John Ramsay Bryce, British historian and parliamentarian	1872	May 4
*Murphy, J. Harvey, U.S. clergyman	Apr. 28, 1882	Sept. 19
*Murray, Charlie, U.S. motion picture comedian	July 22, 1872	July 29
*Murray, Samuel, U.S. sculptor	June 1870	Nov. 3
*Mussolini, Bruno, Italian aviator, son of Benito Mussolini	1918	Aug. 7
*Nagayo, Matao, Japanese educator and bacteriologist	Apr. 1878	Aug. 16
Naon, Romulo S., Argentine statesman	1875(?)	Dec. 30
Narelle-Currie, Marie, British concert singer	1870(?)	Jan. 28
*Natalie, Queen of Serbia	May 2, 1859	May (?)
Nelligan, Emile, Canadian poet	1880(?)	Nov. 18
*Nernst, Walter, German physical chemist	June 25, 1864	Nov. 18
Neuman, Leo Handel, U.S. heart specialist and educator	Sept. 12, 1868	Mar. 15
*Nevinson, Henry Woodd, British war correspondent and author	1856	Nov. 9
Newcastle, Duke of, Henry Francis Hope Pelham-Clinton-Hope, British nobleman, one-time owner of the Hope diamond	Feb. 3, 1866	Apr. 21
Newell, Edward Theodore, U.S. numismatist	Jan. 15, 1886	Feb. 18
*Newlon, Jesse Homer, U.S. educator	July 16, 1882	Sept. 1
Newton, Walter Hughes, U.S. congressman and lawyer	Oct. 10, 1880	Aug. 10
Nice, Harry Whinna, U.S. ex-governor of Maryland	Dec. 5, 1877	Feb. 25
Niles, Walter Lindsay, U.S. medical educator	Jan. 2, 1878	Dec. 22

Name	Birth date	Death date
*Noel, Carlos Martin, Argentine statesman and writer	Oct. 30, 1886	Jan. 3
Nollet, Edouard, French general	1865	Jan. 28 (?)
Norcross, Wilbur Harrington, U.S. educator	June 28, 1882	June 11
Norton, Thomas Herbert, U.S. chemist	June 30, 1851	Dec. 2
*Noyes, William Albert, U.S. chemist	Nov. 6, 1857	Oct. 24
Nutting, Wallace, U.S. clergyman, photographer and writer	Nov. 17, 1861	July 19
Nyswander, Reuben E., U.S. educator	Jan. 4, 1878	Apr. 8
*O'Brien, Edward Joseph Harrington, U.S. author and editor	Dec. 10, 1890	Feb. 25
*O'Connor, Andrew, U.S. sculptor	June 7, 1874	June 11
Ohl, Jeremiah Franklin, U.S. clergyman and author	June 26, 1850	Jan. 21
Olmsted, Edward, U.S. army officer	Jan. 5, 1872	Aug. 21
*Osumi, Baron Mineo, Japanese admiral and supreme war councillor	May 1876	Feb. (?)
Owen, Sir David John, British expert on ports and shipping	Mar. 8, 1874	May 17
*Oxenham, John (William Arthur Dunkerley), British author	(?)	Jan. 24
Paderewska-Wilkonska, Antonina, sister of Ignace Jan Paderewski	Oct. 1, 1858	Oct. 6
*Paderewski, Ignace Jan, Polish pianist, composer and statesman	Nov. 6, 1860	June 29
Pagdin, William, U.S. singer	1872(?)	Jan. 9
Panfiloff, Ivan, Russian general	(?)	Nov. (?)
*Papi, Gennaro, U.S.-Italian conductor	Dec. 1886	Nov. 29
Pardee, George Cooper, governor of California	July 25, 1857	Sept. 1
*Parmoor, Charles Alfred Cripps, 1st Baron, British lawyer and statesman	Oct. 3, 1852	June 30
*Parr, Sir (Christopher) James, New Zealand statesman	May 18, 1869	May 2
Parsons, Claude Van, U.S. congressman	Oct. 7, 1895	May 24
Patenaude, Joseph Oscar, Canadian statesman	May 20, 1869	Feb. 1
Paterson, ("Banjo") Andrew Barton, Australian author and journalist	Feb. 17, 1864	Feb. 5
Patterson, John J., U.S. naval officer	June 14, 1896	Sept. 13
*Paxton, William McGregor, U.S. artist	June 22, 1869	May 13
Pease, Charles Giffin, U.S. antitobacco crusader	Dec. 4, 1854	Oct. 7
Pecori-Giraldi, Count Guglielmo, Italian marshal	1860(?)	Feb. 15
Penn, Arthur A., U.S. musician and composer	1880	Feb. 6
*Penner, Joe (Joseph Pinter), U.S. comedian	Nov. 11, 1904	Jan. 10
Penniman, Josiah Harmar, U.S. educator	July 20, 1868	Apr. 10
Pennybacker, James Edmund, U.S. highway expert	Jan. 1, 1878	Feb. 25
Peoples, Christian Joy, U.S. rear admiral	Oct. 17, 1876	Feb. 3
Perry, Roland Hinton, U.S. sculptor and painter	Jan. 25, 1870	Oct. 27
Peters, Le Roy Samuel, U.S. tuberculosis specialist	Apr. 6, 1882	Dec. 17
Petersen, Carl O., U.S. explorer	1897(?)	Nov. 10
*Phillips, Sir Tom Spencer Vaughan, British naval officer	1888(?)	Dec. 10
Picard, Émile, French mathematician	July 24, 1856	Dec. 12
Pick, Frank, British transportation authority	Nov. 23, 1878	Nov. 7
Pierce, E. Wallace, U.S. chemist, lecturer and author	Dec. 9, 1875	Feb. 8
Pike, Charles Burrall, U.S. historical society executive	June 29, 1871	Apr. 26
Plaskett, John Stanley, Canadian astronomer	Nov. 17, 1865	Oct. 17
Poole, Sir Reginald Ward Edward Lane, British attorney	Nov. 23, 1864	Aug. 11
*Porter, Edwin S., U.S. motion picture pioneer	1869(?)	Apr. 30
Portney, Jan Kuszel, Polish socialist and labour leader	(?)	Sept. 27
Poteet, Fred Halstead, U.S. naval captain	Aug. 2, 1879	July 28
Pourtalès, Count Guy de, French writer	1884	June 13
*Power, Sir D'Arcy, British surgeon	Nov. 11, 1855	May 18
*Prajadhipok, Prince of Sukhodaya and King of Siam	Nov. 8, 1893	May 31
*Prévost, Eugène Marcel, French novelist	May 1, 1862	Apr. 8
*Prien, Guenther, German submarine commander	1908(?)	(?)
Priestman, Sir John, British philanthropist and industrialist	Mar. 22, 1855	Aug. 5
Pulteney, Sir William, British general	May 18, 1861	May 14
Purvis, Arthur Blaikie, British industrialist	Mar. 31, 1890	Aug. 14
*Quidde, Ludwig, German pacifist and winner of 1927 Nobel peace prize	Mar. 23, 1858	Mar. 4
*Radziwill, Princess Catherine (Mrs. Charles Louis Kolb-Danvin), U.S. writer and lecturer	Mar. 30, 1858	May 11
Radziwill, Princess Marie, Polish noblewoman	Oct. 8, 1863	Aug. 7
Rand, Ellen Emmet, U.S. portrait painter	Mar. 4, 1876	Dec. 18
Raper, Alfred Baldwin, British member of parliament	May 8, 1889	July (?)
Rappoport, Charles, French journalist and politician	1866(?)	Nov. (?)
Rayner, Minnie, British actress	May 2, 1869	Dec. 13
Reid, Helen R. Y., Canadian educator	(?)	June 8
*Rennell, First Baron of Rodd (James Rennell Rodd), British diplomat	Nov. 9, 1858	July 27
Rexford, Frank A., U.S. educator	Aug. 22, 1876	Jan. 3
Reyes, Juan, Chilean pianist	1899	Jan. 21
Rhodes, Sir Campbell, British member of council of India	1874	Feb. 7
*Ribeiro, Manoel, Portuguese novelist	1879(?)	Nov. (?)
Richards, John Gardiner, U.S. governor	Sept. 11, 1864	Oct. 9
*Rickert, Thomas A., U.S. labour leader	Apr. 24, 1876	July 28
*Riddle, John Wallace, U.S. diplomat	July 12, 1864	Dec. 8
*Ridge, Lola (Mrs. David Lawson), U.S. poetess	1884	May 19
Rieffel, Aristide, French pacifist	1859(?)	Oct. 7
*Ripley, William Zebina, U.S. economist	Oct. 13, 1867	Aug. 16
*Roberts, Elizabeth Madox, U.S. novelist	1886	Mar. 13
Roberts, Frederick Owen, British M.P.	1876	Oct. 24
Roberts, George Lucas, U.S. educator	Nov. 19, 1860	Feb. 26
Roberts, William Carman, U.S. magazine editor	1877(?)	Nov. 21
*Robinson, Frederick Bertrand, U.S. college president	Oct. 16, 1883	Oct. 19
Robinson, John Wallace, U.S. Negro clergyman	Dec. 7, 1870	Nov. 27
Robinson, Lucius F., Sr., U.S. lawyer	June 12, 1863	June 11
Robinson, Oliver Prescott, U.S. colonel and head of R.O.T.C.	Mar. 29, 1879	Dec. 10
Rockley, Evelyn Cecil, 1st Baron, British M.P.	May 30, 1865	Apr. 1
Rogers, Robert Emmons, U.S. professor of English	Apr. 12, 1888	May 13
Rollet, Paul, French general of the foreign legion		Apr. 16
*Roosevelt, Gracie Hall, U.S. electrical engineer	June 28, 1891	Sept. 25
Roosevelt, Philip James, U.S. corporation executive	May 15, 1892	Nov. 8
*Roosevelt, Sara Delano, mother of Franklin Delano Roosevelt	Sept. 21, 1854	Sept. 7
*Rourke, Constance Mayfield, U.S. writer	Nov. 14, 1885	Mar. 23
Rowe, William Stanhope, U.S. banker	July 30, 1857	May 20
*Rowell, Newton Wesley, Canadian politician and jurist	Nov. 1, 1867	Nov. 22
*Rubens, Horatio Seymour, U.S. lawyer	June 6, 1869	Apr. 3
*Rumbold, Sir Horace George Montagu, British diplomat	Feb. 5, 1869	May 24
Runkle, Erwin William, U.S. psychologist	May 20, 1869	Feb. 14
Russell, Charles Edward, U.S. crusader, newspaperman and author	Sept. 25, 1860	Apr. 23
*Russell, Lady Mary Annette (pseudonym Elizabeth), British author	1866	Feb. 9
Rutherford, Alexander Cameron, Canadian statesman	Feb. 2, 1857	June 11
*Sabatier, Paul, French chemist	Nov. 5, 1854	Aug. 14
*Sackett, Frederic Moseley, U.S. ambassador and senator	Dec. 17, 1868	May 18
St. Just, 1st Baron (Edward Charles Grenfell), British financier	May 29, 1870	Nov. 26
*Sakatani, Viscount Yoshiro, Japanese financier	Jan. 16, 1863	Nov. 14
Salmon, Sir Isidore, British M.P. and head of restaurant chain	Feb. 1876	Sept. 16
*Sanborn, John Pitts, U.S. newspaperman and music critic	1879	Mar. 7
Sanders, William Stephen, British statesman	Jan. 2, 1871	Feb. 4
Saporiti, Alessandro, Italian general	Feb. 12, 1863	July 20
Schaeffer, John A., U.S. college president	May 31, 1886	Apr. 6
Schaff, David Schley, U.S. clergyman and church historian	Oct. 17, 1852	Mar. 2
Schermerhorn, James, U.S. newspaper publisher	Mar. 13, 1865	Dec. 2
Schertzinger, Victor, U.S. movie director	1889	Oct. 26
Schmidt-Degener, Frederik, Dutch art historian	Dec. 10, 1881	Nov. 21
*Schobert, Eugen Ritter Von, German general	1883(?)	Sept. 12
Schoenheimer, Rudolf, U.S. biochemist	May 10, 1898	Sept. 11
*Schroeder, Ludwig Von, German general	Sept. 12, 1884	July 29
Schuetz, Ludwig H., German linguist	Oct. 1, 1873	Mar. (?)
*Schulte, Karl Josef, German cardinal	Sept. 14, 1871	Mar. 11
Schwert, Pius L., U.S. congressman	Nov. 22, 1892	Mar. 17
Scott, William Sherley, U.S. brigadier general	Jan. 12, 1856	Aug. 31
Shatzky, Boris, Russian jurist and professor	1889(?)	Jan. 22
Shawkey, Morris Purdy, U.S. college president	Feb. 17, 1868	Feb. 6
Shearer, Augustus Hunt, U.S. librarian	Feb. 21, 1878	May 31
*Sheppard, Morris, U.S. senator	May 28, 1875	Apr. 9
Sherley, Swagar, U.S. attorney and congressman	Nov. 28, 1871	Feb. 13
Shuman, Edwin Llewellyn, U.S. magazine editor	Dec. 13, 1863	Dec. 13
Sibley, Frederick H., U.S. professor of mechanical engineering	1872	Apr. 2
*Siemens, Carl Friedrich Von, German industrialist and munitions manufacturer	Sept. 5, 1872	July 10
Sikes, Enoch Walter, U.S. educator	May 19, 1868	Jan. 8
Simonds, Frederic William, U.S. geologist and educator	July 3, 1853	Mar. 27
Simpson, Kenneth Farrand, U.S. congressman and lawyer	May 4, 1895	Jan. 25
Sinding, Christian, Norwegian composer	Jan. 11, 1856	Dec. 3
Sirois, Joseph, Canadian notary	Oct. 2, 1881	Jan. 17
Skelton, Oscar Douglas, Canadian statesman and author	1878	Jan. 28
Skilton, Charles Sanford, U.S. composer and organist	Aug. 15, 1868	Mar. 12
Skinner, Richard Dana, U.S. writer and economist	Apr. 21, 1893	Nov. 6
Slotemaker De Bruïne, Jan Rudolph, Dutch statesman	May 6, 1869	Apr. (?)
Smedley, Constance (Mrs. Maxwell Armfield), British author and playwright	(?)	Mar. 9
*Smith, Preserved, U.S. historian and professor	July 22, 1880	May 15
*Smoot, Reed, U.S. senator	Jan. 10, 1862	Feb. 9
Smyth, Sir Nevill Maskelyne, British major general	Aug. 14, 1868	July (?)
*Sombart, Werner, German economist	Jan. 19, 1863	May 19
Somerville, Norman, K. C., Canadian lawyer	Oct. 24, 1878	July 4
Soutar, Andrew, British novelist	Dec. 13, 1879	Nov. 24
Southesk, Earl of (Charles Noel Carnegie), British nobleman	Mar. 20, 1854	Nov. 10
Spafford, Edward Elwell, U.S. American Legion officer	Mar. 12, 1878	Nov. 13
Speyer, James, U.S. banker and philanthropist	July 22, 1861	Oct. 31
Stafford, Lord Edward Stafford Fitzherbert, British admiral	1864	Sept. 28
*Stamp, Josiah Charles Stamp, 1st Baron, of Shortlands, British economist and banker	June 21, 1880	Apr. 16
*Stang, Fredrik, Norwegian statesman, educator and jurist	1867	Nov. 15
Stanton, Walter T., U.S. judge	Apr. 5, 1877	Nov. 8
Staver, Wilson Willard, U.S. educator, author and poet	1880	Jan. 7
Stearly, Wilson Reiff, U.S. Episcopal bishop	May 8, 1869	Nov. 8
Stelzle, Charles, U.S. clergyman and sociologist	June 4, 1869	Feb. 27
Stephenson, James, British motion picture actor	Apr. 14, 1900	July 29
Stewart, De Lisle, U.S. astronomer	Mar. 10, 1870	Feb. 8
*Stiles, Charles Wardell, U.S. medical zoologist	May 15, 1867	Jan. 24
Stillwell, Lewis Buckley, U.S. electrical engineer	Mar. 12, 1863	Jan. 19
*Stolz, Joseph, U.S. rabbi	Nov. 3, 1861	Feb. 7
Stone, George Edward, U.S. botanist	Sept. 6, 1860	May 28
Stone, Hannah Mayer, U.S. pioneer in the birth control movement	1893	July 10
*Stonehaven, 1st Viscount of Ury (John Lawrence Baird), British statesman	Apr. 27, 1874	Aug. 20
Strawbridge, Anne West, U.S. author and pilot	Mar. 20, 1883	Sept. 9
Strong, Lee Abram, U.S. entomologist	June 17, 1886	June 2
Stroock, Solomon M., U.S. lawyer and executive in American Jewish Committee	Sept. 22, 1873	Sept. 11
Stuart, Duane Reed, U.S. educator	Sept. 27, 1873	Aug. 29
*Stuart, James Everett, U.S. painter	Mar. 24, 1852	Jan. 1
*Suffolk and Berkshire, Earl of (Charles Henry George Howard), British scientist	Mar. 2, 1906	May 12
Sutherland, John Preston, U.S. homoeopathist and educator	Feb. 9, 1854	Feb. 21
Sweet-Escott, Sir (Ernest) Bickham, British colonial administrator	Aug. 20, 1857	Apr. 10
Swift, Ernest John, U.S. Red Cross official	Jan. 8, 1883	Oct. 19
Symmonds, Charles Jacobs, U.S. brigadier general	Oct. 6, 1866	July 16
Taberski, Frank, U.S. billiard champion	1889	Oct. 23
*Tagore, Sir Rabindranath, Indian poet and author	May 6, 1861	Aug. 7
Taliaferro, Thomas Hardy, U.S. educator	Mar. 22, 1871	Sept. 25
*Tassin, Algernon De Vivier, U.S. author and educator	Dec. 11, 1869	Nov. 3
Tauscher, Hans, U.S. munitions manufacturer	(?)	Sept. 5
Taylor, Charles Henry, U.S. journalist	Oct. 2, 1867	Aug. 18
Taylor, Edward Thomas, U.S. representative	June 19, 1858	Sept. 3
*Taylor, Henry Osborn, U.S. historian and philosopher	Dec. 5, 1856	Apr. 13
*Teleki, Pál, Count, Hungarian statesman and geographer	Nov. 1, 1879	Apr. 3

Name	Birth date	Death date
TENNENT, DAVID HILT, U.S. biologist and teacher	May 28, 1873	Jan. 14
THOMPSON, CHARLES MINER, U.S. magazine editor and author	Mar. 24, 1864	Dec. 19
THOMPSON, GEORGE L., U.S. state senator	Nov. 22, 1864	Sept. 1
*THOMPSON, JAMES WESTFALL, U.S. historian	June 3, 1869	Sept. 30
*THOMPSON, REGINALD CAMPBELL, British archaeologist and Assyriologist	Aug. 21, 1876	May 24(?)
TIMBERLAKE, CHARLES BATEMAN, U.S. congressman	Sept. 25, 1854	May 31
*TITULESCU, NICOLAE, Rumanian diplomat	1883	Mar. 17
TODD, HENRY STANLEY, U.S. portrait painter	June 7, 1871	Apr. 21
TREANOR, WALTER EMANUEL, U.S. judge	Nov. 17, 1883	Apr. 26
TREAT, CHARLES GOULD, U.S. major general	Dec. 30, 1859	Oct. 11
TRIMBLE, WILLIAM COPELAND, Irish publisher	1851	Nov. 25
TRUMBULL, CHARLES GALLAUDET, U.S. editor	Feb. 20, 1872	Jan. 13
TUCKER, GARDINER CHYLSON, U.S. Episcopal clergyman	Oct. 1, 1851	Nov. 10
TUTTLE, ROBERT C., U.S. oil firm official	(?)	Sept. 16
*UDET, ERNST, German aviator	Apr. 26, 1896	Nov. 17
*UPDIKE, DANIEL BERKELEY, U.S. printer	Feb. 24, 1860	Dec. 28
*USSISHKIN, MENAHEM, Zionist leader	Aug. 15, 1863	Oct. 2
*VAN DEVANTER, WILLIS, U.S. associate justice, U.S. supreme court	Apr. 17, 1859	Feb. 8
VAN GELDER, MARTINUS, U.S. pianist and composer	July 31, 1854	Feb. 26
VAN HORN, ROBERT OSBORN, U.S. brigadier general	Aug. 15, 1876	June 26
VARA, FELIX, German major general	(?)	Nov.(?)
VENTURI, ADOLFO, Italian senator and art authority	Sept. 4, 1856	June 9
VERNON, GRENVILLE, U.S. author and journalist	July 22, 1883	Nov. 30
VESTEY, LADY EVELYN, British shipping executive	(?)	May 23
VIARDOT, PAUL, French opera conductor and violinist	July 20, 1857	Oct. (?)
*VINCENT, GEORGE EDGAR, U.S. educator	Mar. 21, 1864	Feb. 1
*VINCENT, HENRY BETHUEL, U.S. composer	Dec. 28, 1872	Jan. 7
VINCENT, LEON H., U.S. author and lecturer	Jan. 1, 1859	Feb. 10
VON BRIESEN, KURT, German general	1883(?)	Nov. 20
VON DONOP, SIR STANLEY BRENTON, British army officer	Feb. 22, 1860	Oct. 17
*WAKEFIELD, CHARLES CHEERS WAKEFIELD, 1ST VISCOUNT OF HYTHE, British philanthropist	Dec. 1859	Jan. 15
WALBROOK, HENRY MACKINNON, British drama critic, playwright and author	1863	Feb. 13
WALLACE (DAVID), EUAN, British statesman	1892	Feb. 10
WALLACE, EDWARD WILSON, Canadian educator	Nov. 2, 1880	June 20
*WALPOLE, SIR HUGH SEYMOUR, British novelist	1884	June 1
WALSH, WILLIAM HENRY, U.S. hospital expert	Mar. 8, 1882	Mar. 28
WARNER, HENRY EDWARD, U.S. author, poet and composer	Jan. 17, 1876	Apr. 11
*WATSON, JOHN CHRISTIAN, Australian politician	Apr. 9, 1867	Nov. 18
WEAR, JOSEPH WALKER, U.S. tennis player and official	Nov. 27, 1876	June 4
WELCH, MICHAEL ("MICKEY"), U.S. baseball star	July 4, 1859	July 30
WELCH, WILLIAM ADDAMS, U.S. major and consulting engineer	Aug. 20, 1868	May 4
WELLINGTON, 5TH DUKE OF, ARTHUR CHARLES WELLESLEY, great-grandson of 1st duke of Wellington	June 9, 1876	Dec. 11
WELLINGTON, BARRETT R., U.S. attorney and mathematician	1884(?)	Jan. 14
WELLS, RULON SEYMOUR, U.S. Mormon leader	July 7, 1854	May 7
WHEELWRIGHT, J.S., U.S. surgeon	Nov.23, 1875	Oct. 9
WHITE, TRUMBULL, U.S. magazine editor, author and explorer	Aug. 12, 1868	Dec. 13
*WHORF, BENJAMIN LEE, U.S. anthropologist	Apr. 24, 1897	July 26
WICK, FRANCES GERTRUDE, U.S. educator	Oct. 2, 1875	June 15
WILBERFORCE, SIR HERBERT WILLIAM WRANGHAM, British tennis star	1864	Mar. 28
WILE, FREDERIC WILLIAM, U.S. newspaperman and author	Nov. 30, 1873	Apr. 7
WILKES, ERNEST H., U.S. insurance executive	Sept. 17, 1876	July 31
*WILLCOX, SIR WILLIAM HENRY, British expert on poisons	Jan. 18, 1870	July 8
*WILLIAM II, German Emperor	Jan. 27, 1859	June 4
WILLIAMS, WILLIAM T. B., U.S. educator	June 3, 1866	Mar. 26
*WILLINGDON, MARQUESS OF (FREEMAN FREEMAN-THOMAS), British diplomat	Sept. 12, 1866	Aug. 12
WILSON, GEORGE ARTHUR, U.S. author and educator	Mar. 17, 1864	Oct. 4
WILSON, SIR HENRY FULLER MAITLAND, British lieutenant general	Feb. 18, 1859	Nov. 16
WINCHESTER, JAMES RIDOUT, U.S. Episcopal bishop	Mar. 15, 1852	Oct. 27
WINGO, IVY, U.S. baseball player	1890(?)	Mar. 1
WINN, FRANK L., U.S. major general	Oct. 4, 1864	Feb. 24
WITMARK, ISIDORE, U.S. music publisher and composer	(?)	Apr. 9
WITTIG, EDWARD, Polish sculptor	1881	Nov. 28
WOODRUFF, EDWIN HAMLIN, U.S. educator	Sept. 2, 1862	July 8
WOODRUFF, THOMAS ADAMS, U.S. ophthalmologist	June 4, 1865	Apr. 15
*WOOLF, VIRGINIA, British novelist and essayist	1882	Mar.28(?)
WORTH, JACQUES, French dressmaker	(?)	Jan. 28(?)
*WREN, PERCIVAL CHRISTOPHER, British soldier and author	1885	Nov. 23
WRIGHT, HUNTLEY, British actor	Aug. 7, 1869	July 10
YARROW, WILLIAM, U.S. mural painter	Sept. 24, 1891	Apr. 21
YCAS, MARTYNAS, Lithuanian statesman	1884	Apr. 5
YOST, CASPER SALATHIEL, U.S. newspaper editor	July 1, 1864	May 30
YOUNG, ROSE, U.S. author, editor and suffragist	(?)	July 6
*ZAHLE, HERLUF, Danish diplomat	Mar. 14, 1873	May 4

O'Brien, Edward Joseph Harrington (1890 – 1941), U.S. author and editor, was born Dec. 10 in Boston. He was educated at Boston college and at Harvard, and at the age of 25 he persuaded a publisher to bring out a volume of short stories that he edited. In this volume, *Best Short Stories* (1915), he devised a method for grading short stories which made him famous in following years. His short story anthologies appeared annually after 1915. He edited *Best British Short Stories*, also an annual anthology (the first four volumes of which were co-edited with John Cournos) (1921–40), etc. He translated the works of Henri Barbusse and Paul Claudel from the French. O'Brien died at his home, Gerrards Cross, Buckinghamshire, England, Feb. 25.

Obstetrics: *see* GYNAECOLOGY AND OBSTETRICS.

Oceanography. So far as is known, very few field observations were carried out during 1941. Moreover, few oceanographic publications were received from European countries, so that it is only possible to summarize such developments as were reported in the United States.

Ocean Currents.—The rather detailed thermal structure of the surface layer in regions of great lateral shear was further investigated with the bathythermograph. Especially complete surveys were carried out by the "E. W. Scripps" off the coast of southern California.

The exchange of heat and water vapour between the sea and the atmosphere received considerable attention from a number of investigators, both from the meteorological and the oceanographical standpoints. The importance of evaporation from the sea surface became more generally recognized.

Plankton.—Additional detailed biological surveys were carried out by the "Atlantis" in the Georges Bank area, but so far as was known no other extensive biological field work was attempted. Most reports published during 1941 dealt with collections made previously. (*See* also FISHERIES; MARINE BIOLOGY; ZOOLOGY.)

BIBLIOGRAPHY.—"Fine Structure of the Edge of the Gulf Stream," *Amer. Geophysical Union, Transactions of 1941;* "Research Within Physical Oceanography and Submarine Geology at the Scripps Institution of Oceanography," *ibid.;* "On the Energy Exchange Between Sea and Atmosphere," *Bull. Amer. Meteorological Society*, vol. xxii, no. 7; "Surface Cooling and Streaming in Shallow Fresh and Salt Waters," *Jour. of Marine Research*, vol. iv, no. 2; "Plankton Studies, IV, Georges Bank," *Bull. Bingham Oceanogr. Coll.*, vol. vii, no. 4; "The Effect of the Circulation of Water on the Distribution of the Calanoid Community in the Gulf of Maine," *Biol. Bull.* vol. lxxx, no. 1. (C. O'D. I.)

O'Connor, Andrew (1874–1941), U.S. sculptor, was born June 7 in Worcester, Mass. His father was a tombstone cutter and the boy learned to carve figures in his father's stoneyard. Later, he studied art under John Sargent and Auguste Rodin. He began winning prizes early in the century and he is best known for his statue of Abraham Lincoln in Springfield, Ill., for which he received $50,000. In 1928 he won the Beaux Arts Salon prize for sculpture, the first time that this famous French award was ever conferred upon a foreigner; in 1906 he had won the Salon's second prize. Among his other works are "Mourning Woman," in the National gallery in London; "Tristan and Isolde"; a marble statue of Gen. Lew Wallace in Washington, D.C., and a bronze statue of the general at Crawfordsville, Ind.; and a bronze statue of Lafayette in Baltimore. O'Connor died in Dublin, Eire, June 11.

OEM: *see* EMERGENCY MANAGEMENT, OFFICE FOR.

Office for Emergency Management: *see* EMERGENCY MANAGEMENT, OFFICE FOR.

Office of Civilian Defense: *see* CIVILIAN DEFENSE, OFFICE OF.

Office of Price Administration: *see* PRICE ADMINISTRATION, OFFICE OF.

Office of Price Administration and Civilian Supply: *see* PRICE ADMINISTRATION, OFFICE OF.

Office of Production Management: *see* PRODUCTION MANAGEMENT, OFFICE OF.

Office of Scientific Research and Development: *see* SCIENTIFIC RESEARCH AND DEVELOPMENT, OFFICE OF.

O. Henry Memorial Awards: *see* LITERARY PRIZES: *United States.*

Ohio. A north central state of the United States, popularly known as the "Buckeye state." Area, 41,222 sq.mi.; pop. (1940) 6,907,612, of whom 2,294,626 were rural and 4,612,986

urban; foreign-born, 519,266. Capital, Columbus (306,087). Other cities of more than 100,000 were Cleveland (878,336), Cincinnati (455,610), Toledo (282,349), Akron (244,791), Dayton (210,718), Youngstown (167,720) and Canton (108,401).

History.—When Gov. John W. Bricker was inaugurated Jan. 13, 1940, it was the first time since 1904 that a Republican governor had taken the oath for a second consecutive term. Sworn in with him were Paul M. Herbert (Rep.) as lieutenant governor, Don H. Ebright (Rep.) as treasurer, Thomas J. Herbert (Rep.) as attorney-general, John E. Sweeney (Dem.) as secretary of state and Joseph T. Ferguson (Dem.) as auditor.

The state legislature, which remained in session from early in January to May 17, passed considerable important legislation. Notable new laws prohibited the sale and use of fireworks except for public display; established a new state guard to replace the national guard, which had been made a part of the United States army; set up uniform traffic regulations conforming with those of other states; legalized medical service associations; forbade sit-down strikes; required applicants for marriage licences to produce certificates showing freedom from syphilis; and exempted newspapermen from revealing the source of their information in any legal procedure.

Although the state budget of $352,800,000 for the 1941–42 biennium was the largest in the state's history, Democrats and representatives of the cities charged that Gov. Bricker was hoarding a huge surplus in the state treasury in order to make tax reductions in 1942, when he ran for re-election. Representatives of the local subdivisions met in Columbus Dec. 11 and demanded that the governor call a special session of the legislature to make a "more equitable" distribution of state sales tax receipts, asserting that those receipts had risen and that the cities, counties, villages and townships needed more money to meet extra expenses necessitated by the war. As the year closed, the governor had not yielded to these demands.

As new defense industries went into production and old ones expanded there was a great demand for labour and a consequent shifting of population. A serious housing shortage resulted in some regions, where it was necessary in some instances to set up trailer camps and begin emergency housing construction. The situation was most critical in Ravenna, Sandusky, Akron, Dayton, Warren and Youngstown.

Education.—Ohio in 1939–40 had 3,835 elementary schools with a total enrolment of 675,343 pupils and a total teaching staff of 21,079; 129 junior high schools with an enrolment of 87,441 and a teaching staff of 2,860; 1,078 secondary schools with an enrolment of 393,397 and a teaching staff of 14,775; 124 special schools with an enrolment of 23,110 and a teaching staff of 899; 197 kindergarten classes with an enrolment of 20,466 and a teaching staff of 392. Counting postgraduate students and special-subject teachers, the state had 5,363 schools with an enrolment of 1,200,769 and a teaching staff of 40,630.

The five state-supported universities in Ohio are: Ohio State university at Columbus with an enrolment of 17,568 and a teaching staff of 800 in 1941; Ohio university at Athens with an enrolment of 4,305 and a teaching staff of 251; Kent State university at Kent with an enrolment of 4,432 and a teaching staff of 149; Miami university at Oxford with an enrolment of 3,474 and a teaching staff of 239; Bowling Green State university at Bowling Green with an enrolment of 2,221 and a teaching staff of 155.

Public Welfare, Charities, Correction.—Ohio's relief-case load for Oct. 1941 was 42,020, the lowest since the state started keeping relief records. The average number of general relief cases for 1941 was 54,618 and the total spent was $16,877,736. Average of WPA employment, 72,404, at a total cost of $51,180,865; average number of cases of aid for the aged, 137,443, at total cost of $38,499,052; aid to dependent children, 11,725, at cost of $5,578,963; aid to the blind, 4,006, at cost of $967,238; average number of unemployment benefit recipients (11 months), 17,815, at total cost of $11,023,253.

State institutions as of Dec. 1, 1941, included nine hospitals for the insane with 19,814 inmates; three institutions for the feeble-minded with 5,605 inmates; four penal institutions with 7,929 inmates; two industrial schools with 1,128 inmates; one hospital for epileptics with 2,074 inmates; one sanatorium with 165 inmates; one soldiers' and sailors' home with 576 inmates. In 1940, $8,779,269 was spent on these institutions.

Communication.—Ohio had 82,488 mi. of highways in 1941 outside municipalities; 16,299 mi. were classified as rural. Expenditures on highways in 1941 were $40,283,734.43, of which $23,394,294.82 were for construction and $16,889,439.61 were for maintenance. The state had 8,870.26 mi. of railroads, 111 airports and landing fields and 1,426,697 telephones.

Banking and Finance.—There were 452 state banks in Ohio with deposits (Sept. 24, 1941) of $1,806,686,071 and resources of $1,995,155,268. On the same date there were 242 active national banks in Ohio with deposits aggregating $1,367,174,000 and resources of $1,517,327,000. As of June 30, 1941, there were 559 state-chartered savings and loan associations with total resources of $653,363,266.72. As of Dec. 31, 1940, there were 75 state-chartered savings and loan associations in liquidation with assets of $42,204,390.40. There were 121 federal savings and loan associations in Ohio with total assets of $250,519,099 as of Dec. 31, 1941.

The state budget for the 1941–42 biennium was $352,800,000.

Agriculture.—The total acreage harvested in Ohio in 1941 (46 crops) was 9,893,900; in 1940, 9,790,000. Total value of agricultural production in the state in 1940 was $346,226,000. Cash income from crops in 1940 was $101,136,000; from livestock and livestock products, $228,119,000; from government payments, $16,971,000. In general, 1941 was favourable for crop production in Ohio, with high yields prevailing in spite of a marked deficiency in rainfall.

Table I.—*Leading Agricultural Products of Ohio, 1941 and 1940*

Crop	1941	1940
Corn, bu.	160,974,000	122,360,000
Wheat, bu.	48,978,000	42,121,000
Oats, bu.	51,374,000	44,396,000
Barley, bu.	1,140,000	840,000
Rye, bu.	1,332,000	1,296,000
Buckwheat, bu.	158,000	288,000
Soybeans, bu.	13,143,000	8,835,000
Potatoes, bu.	10,614,000	9,476,000
Apples, bu.	7,064,000	5,074,000
Peaches, bu.	1,427,000	443,000
Pears, bu.	840,000	816,000
Grapes, tons	25,700	37,500
Tame hay, tons	3,325,000	3,842,000
Tobacco, lb.	26,025,000	28,943,000
Popcorn, lb.	14,525,000	7,700,000
Sugar beets, tons	42,600	45,000
Maple syrup, gal.	323,000	332,000

Manufacturing.—The total estimated value of manufactures in 1939 was $4,584,665,659; total employment, 598,397; total wages paid, $812,676,444.

Table II.—*Principal Industries of Ohio, 1939 and 1937*

Industry	Value of products	
	1939	1937
Steel works and rolling mill	$609,804,548	$733,351,272
Motor vehicles, bodies and parts	285,681,412	206,133,017
Tires and inner tubes	268,010,485	307,255,214
Meat packing, wholesale	132,483,991	139,069,127
Blast furnace products	131,824,375	154,655,026
Bread and other bakery products	84,324,585	105,261,182
Petroleum refining	84,137,190	97,297,783

Mineral Production.—The total estimated value of mineral production for Ohio (1940) was $61,457,191.

Table III.—*Principal Mineral Products of Ohio, 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Bituminous coal	$37,114,560	$32,981,760
Petroleum	3,514,560	3,534,720
Sand and Gravel	*	6,142,642
Fireclay	*	1,175,976
Sandstone	*	528,891
Foundry sand	*	401,733
Natural abrasives	*	290,614

*Unavailable.

(P. Bv.)

Ohio State University.

Formally established as a land-grant institution in 1870, the Ohio State university opened its doors on Sept. 17, 1873, to a student body of 17. In the autumn quarter of 1940 the full-time, resident enrolment reached a figure of 13,007. The enrolment, including summer quarter, was 17,568 in 1941. Centrally located in Columbus, the capital city of Ohio, the university draws its student body from all 88 counties, as well as from other states and nations.

The university is open to women and to men. It has ten colleges: agriculture, arts and sciences, commerce and administration, dentistry, education, engineering, law, medicine, pharmacy and veterinary medicine; a graduate school; and five special schools: home economics, journalism, nursing, optometry and social administration. Graduate work is offered through the doctor of philosophy degree. Recent additions include an exploratory course for students undecided on their college plans, a general course for those not working for degrees, a marketing curriculum

for women. A new building program starting in the fall of 1941 included new facilities for music, agricultural laboratories and a library addition. Dr. Howard L. Bevis, president, took office Feb. 1, 1940. (H. L. B.)

Oil: *see* PETROLEUM.

Oils and Fats, Vegetable and Animal: *see* VEGETABLE OILS AND ANIMAL FATS.

Oklahoma. A west south-central state and the 46th of the United States. The people of the state are popularly known as "Sooners," from the name applied to those who crossed the starting line sooner than the time fixed by the government for the first land run into Oklahoma, April 22, 1889. Area, 69,283 sq.mi.; pop. (1940) 2,336,434, a decrease of 59,606 since 1930. The rural population in 1940 numbered 1,456,771; urban, 879,663. Approximately 87% of the population was native white, 7% Negro, 4% Indian and 2% foreign born, Mexican and miscellaneous. The state's two largest cities are Oklahoma City (204,424), the capital, and Tulsa (142,157).

History.—Perhaps the most important development during 1941 was the adoption, at a special election on March 11, of a constitutional amendment sponsored by Governor Leon C. Phillips, providing for the financing of the state government. This amendment required the state to operate with a balanced budget by making unlawful any appropriations or expenditures in excess of current income. Since the state's revenue may not be secured from ad valorem taxes—the income from these goes to local units—the state legislature found it necessary to increase the revenue from various tax sources to maintain the functions of government and to pay off the debt resulting from the deficits piled up from 1930 to 1940. As a result of the new levies and the rise in prices and volume of business, state revenues during the first quarter of the fiscal year 1941–42 were $4,000,000 over corresponding collections in the preceding year. It was anticipated in 1941 that the state would close the fiscal year with a surplus. Two other constitutional amendments were adopted at the March election. The first made possible more liberal old-age pensions. The second established a nine-member board of state regents for higher education, to co-ordinate all state educational institutions. Under Governor Phillips in 1941 were the following other state officers: James E. Berry, lieutenant governor; C. C. Childers, secretary of state; Frank C. Carter, state auditor; Mac Q. Williamson, attorney-general; Carl B. Sebring, state treasurer.

Education.—In the public elementary schools in 1940–41 were enrolled 466,597 children, with 20,980 teachers. In the 819 public secondary schools were enrolled 139,591, with 5,154 teachers. In the University of Oklahoma, Norman and Oklahoma City 8,527 students were enrolled during 1940–41, with a staff of 375. In the Oklahoma Agricultural and Mechanical college, Stillwater, 7,649 students were enrolled, with a staff of 411. In the six state-supported colleges at Ada, Alva, Durant, Edmond, Tahlequah and Weatherford, a total of 7,283 students was enrolled, with a staff of 328. The state also maintains the Panhandle Agricultural and Mechanical college, Goodwell, and the Oklahoma College for Women, Chickasha. The State College for Negroes at Langston had 1,028 students and a faculty of 73.

Communication.—Oklahoma maintained approximately 101,000 mi. of state and rural highways in 1941, not including streets in towns and cities. Expenditures for 1940–41 were $21,571,000, including $3,300,000 contributed by the federal government. In addition, the state apportioned $1,503,000 to cities and towns for the upkeep of streets. Within the state there were 6,487 mi. of railroad and about 750 mi. of airways with 46 airports.

Banking and Finance.—National banks numbered 207 in June 1941, with capital of $52,963,000 and deposits of $442,771,000. There were 184 state banks with capital of $9,071,000 and deposits of $65,177,000. There were 31 federal savings and loan associations with resources of $49,756,000 and 32 state associations with resources of $19,864,000. State receipts during 1940–41 were $74,353,000, including $13,000,000 from the federal government; expenditures were $80,429,000. The state funded debt stood at $39,037,735, with accrued reserves of $1,413,305, leaving a net debt of $37,624,430.

Agriculture.—The total value of agricultural production in 1941 was $204,626,000, as compared with $157,889,000 in 1940; the total number of acres harvested in 1941 was 13,420,000. The cash income to farmers in 1940 was $86,209,000 from crops, $88,839,000 from livestock and $25,638,000 from government payments, a total of $200,686,000.

Table I.—*Leading Agricultural Products of Oklahoma, 1941 and 1940*

Crop	1941	1940
Wheat, bu.	48,610,000	58,290,000
Corn, bu.	31,202,000	38,743,000
Oats, bu.	25,900,000	35,351,000
Grain sorghums, bu.	13,260,000	15,664,000
Barley, bu.	9,216,000	7,310,000
Cotton, bales	750,000	802,000
Hay, tons	1,716,000	1,555,000
Forage, tons	1,210,000	982,000

Manufacturing.—Total value of manufactures in 1939 was $312,168,499, as compared with $366,088,721 in 1937. State industries employed 33,528 persons in 1939. During the year salaries of $11,090,299 and wages of $30,465,185 were paid.

Table II.—*Principal Industries of Oklahoma, 1939 and 1937*

Industry	1939	1937
Petroleum refining	$106,666,837	$144,474,915
Meat packing	33,001,703	38,555,703
Milling—flour and other grain products	23,023,319	33,110,822
Creamery butter	13,162,718	15,149,654
Publishing and printing	10,288,905	12,066,319
Bakery products	10,052,666	10,787,412
Smelting and refining of nonferrous metals	9,122,686	13,537,488
Oil field machinery	8,523,190	8,320,390
Glass, clay and stone products	6,887,716	6,783,870
Boiler shop products	6,355,903	7,527,539
Cottonseed products	6,142,384	5,661,596

Mineral Production.—The total value of minerals produced in 1940 was $236,000,000, about the same as in 1939. The production of petroleum declined in 1940 and 1941 in some of the older pools, but four new pools were discovered, the Cumberland, Prague, Apache, and Hotulke pools, and six extensions were developed. Iron ore, a new product for Oklahoma, was mined in the Arbuckle mountains near Sulphur.

Table III.—*Principal Mineral Products of Oklahoma, 1940 and 1939*

Mineral	Value 1940	Value 1939
Petroleum	$162,500,000	$166,300,000
Natural Gas	31,603,000	28,103,000
Zinc	20,529,810	14,590,410
Natural Gasoline	8,026,000	15,502,000
Bituminous Coal (est.)	4,350,000	2,486,000
Lead	2,124,000	2,605,680

(R. GIT.)

Old-Age Insurance: *see* SOCIAL SECURITY.

Old Age Pension: *see* RELIEF; SOCIAL SECURITY. *See* also under various states.

Oleomargarine: *see* BUTTER.

Oman and Muscat: *see* ARABIA.

Ontario. One of the four original provinces of the Dominion of Canada (*q.v.*); area 412,582 sq.mi.; population 1941, 3,756,632. Capital, Toronto, 656,930. The population is 77% native-born and 60% urban. The lieutenant governor in 1941 was Albert Matthews; the premier, M. F. Hepburn.

Education.—The registration in the public schools in 1941 was 724,531; in the private schools 20,190. The state university is the University of Toronto, with 6,031 students and 1,057 instructors in 1941. The other universities are Queen's, in Kingston, with 1,819 students and 133 instructors, and the University of Western Ontario, in London, with 1,374 students and 245 instructors.

Communications.—There were 56,298 mi. of surfaced highways and 16,302 mi. of earth roads in 1941. The highway cost for the fiscal year 1939–40 was $36,054,382. The railroad mileage was 10,570 and the number of telephones, 629,096.

Table I.—*Leading Agricultural Products of Ontario, 1941 and 1940*

Crop	1941	1940
Wheat, bu.	23,400,000	23,821,000
Oats, bu.	86,554,000	86,639,000
Barley, bu.	15,519,000	16,600,000
Corn, bu.	6,956,000	8,007,000
Potatoes, cwt.	6,753,000	7,247,000
Turnips, cwt.	21,528,000	21,036,000
Hay and clover, tons	5,021,000	4,682,000

Finance.—Government receipts for the fiscal year 1939–40 were $106,384,670; expenditures $109,618,967. The gross debt was $607,788,555; net debt $596,890,132. The province had assets valued at $235,000,000. These assets include the Ontario Hydro-Electric and the Temiskaming and Northern Ontario railroad.

Agriculture.—The acreage of land under cultivation in 1941 was 9,156,800, crops produced were valued at $343,137,000.

Manufacturing.—The value of manufactures in 1939 was $1,745,674,707; number of employees 318,781 and wages paid $378,376,209.

Table II.—Principal Industries of Ontario, 1938 and 1937

Industry	Value of products	
	1938	1937
Smelting and refining	$166,012,623	$192,248,914
Automobiles	110,207,173	133,315,645
Meat packing	79,197,442	75,917,387
Electrical supplies	68,240,333	74,510,006
Flour and feed	66,763,154	70,815,603
Pulp and paper	60,946,197	72,048,378
Butter and cheese	54,850,365	54,744,598

BIBLIOGRAPHY.—*Report of the Department of Labour; Statistical Year Book of Ontario; Canada Year Book, 1941.* (J. C. HE.)

OPA: *see* PRICE ADMINISTRATION, OFFICE OF.

OPACS: *see* PRICE ADMINISTRATION, OFFICE OF.

Opera: *see* MUSIC.

OPM: *see* PRODUCTION MANAGEMENT, OFFICE OF.

Oranges. Indicated production of oranges in the United States in 1941 was 84,482,000 boxes, the department of agriculture reported as of Dec. 1, 1941. This estimate covered the crop from the 1941 bloom. The 1940 crop was 84,082,000 boxes; the ten-year (1930–39) average, 60,283,000 boxes. The 1941–42 early and midseason crops were estimated, as of Dec. 1, at 40,462,000 boxes, compared with 38,876,000 boxes in 1940–41 and 36,363,000 boxes in 1939–40.

U.S. Production of Oranges by States, 1941 and 1940

State	1941 boxes	1940 boxes	State	1941 boxes	1940 boxes
California			Texas	3,100,000	2,750,000
Valencias	29,520,000	30,006,000	Arizona	600,000	500,000
Navels & miscellaneous	19,764,000	19,472,000	Louisiana	192,000	253,000
Florida			Alabama*	5,000	1,000
Early & midseason	16,800,000	15,900,000	Mississippi*	1,000	.....
Valencias	12,700,000	12,500,000			
Tangerines	1,800,000	2,700,000			

*Production estimated in terms of standard boxes, each equal to about two of the "half-straps" commonly used.

Brazil adopted control of its orange market on Sept. 18, 1941 and fixed export quotas. Before war broke out in 1939, Brazil shipped between 5,000,000 and 6,000,000 boxes of oranges annually: more than 2,000,000 boxes each to the United Kingdom and the Argentine, about 500,000 boxes each to Belgium and the Netherlands and about 275,000 boxes to Germany. But the war greatly limited the market for Brazilian exports. The British ministry of food contracted with Jamaica orange growers for 4,480 short tons of bitter orange marmalade pulp and 6,720 tons of sweet orange pulp, to be preserved in sulphur dioxide and shipped in 50-gal. bbl.

The Spanish crop of oranges for 1941 was estimated at 14,172,000 boxes (70 lb. to the box), about 30% under the 1940 crop. The government's national orange syndicate controls the crop, about 8,000,000 boxes of which were marked for export, chiefly to Germany.

Canada lifted its ban on imports of U.S. tangerines and mandarines Oct. 28, 1941. Such imports from nonsterling countries had been prohibited since Dec. 2, 1940. Japan formerly supplied the Canadian market with tangerines and mandarines. (S. O. R.)

Oregon. A Pacific state of the U.S.A., admitted to the union Feb. 14, 1859. Area, 96,350 sq.mi.; pop. (1940) 1,089,684. Capital, Salem (30,908); chief city, Portland (305,394.) Governor in 1941, Charles A. Sprague.

History.—The state's financial situation being favourable, the legislature left taxation and everything else approximately as they found it at the beginning of 1941. This restraint proved wise as the year moved on, for the income tax and unexpected inheritance taxes piled up a surplus. Under existing constitutional limitations, the money could not be spent.

So far as the defense program was concerned, Oregon's chief contributions in 1941 were shipbuilding and expansion of lumber production to meet the nation's construction needs. At the end of 1941, there were many thousands of persons at work in the Portland shipyards. The yards had delivered several ships; more were at the outfitting docks, others were on order and still others were under construction. New yards were ordered. The state became one of the world's new centres of ship construction.

A giant aluminum plant was awarded to Oregon; a new air base was built. The Portland air base was expanded and two great cantonments were tentatively planned for the western part of the state.

Education.—In 1940 there were 205,928 pupils in the public schools, including 63,057 in high schools. There were 8,104 teachers and school properties were valued at $62,719,297. The school debt was $13,371,251.65.

Finance.—The state ended 1941 with a surplus of about $1,500,000. The state bonded debt (Jan. 1, 1941) was $35,141,285.

Communication.—On Jan. 1, 1939 there were 4,394 mi. in the primary state highway system, of which 4,254 mi. were surfaced. Highway expenditures for 1939 amounted to $16,182,000. In 1938 there were 3,428 mi. of steam railways in Oregon.

Agriculture.—The total cash income of Oregon farmers in 1940 was $115,547,000, of which $5,699,000 represented government payments. The production of the principal grain crops increased in 1941 with the exception of spring wheat, which showed a sharp decline from the harvest of 1940.

Table I.—Principal Agricultural Products of Oregon, 1941 and 1940

Crop	1941	1940	Crop	1941	1940
Corn, bu.	1,920,000	1,860,000	Barley, bu.	6,048,000	5,000,000
Oats, bu.	10,426,000	7,950,000	Spring wheat, bu.	3,105,000	4,700,000

Manufacturing.—The census of 1939 showed 2,248 manufacturing establishments in Oregon; 69,880 persons employed; salaries and wages, $91,326,581; value of products, $365,374,436. Major items: logging camps, $23,363,038; sawmills, $108,663,140; planing mills, $8,122,845; meat packing, $15,178,448; paper mills $15,698,747.

Mineral Production.—Mineral products of Oregon had a total value of $8,636,440 in 1939, as compared with $7,536,408 in 1938.

Table II.—Principal Mineral Products of Oregon, 1939 and 1938

Mineral	Value, 1939	Value, 1938	Mineral	Value, 1939	Value, 1938
Gold	$3,268,020	$2,860,515	Mercury	$477,293	$347,917
Stone	1,682,175	2,025,335	Clay products	410,963	226,312
Sand and gravel	1,233,320	926,601			

(P. H. P.)

OSRD: *see* SCIENTIFIC RESEARCH AND DEVELOPMENT, OFFICE OF.

Osteopathy. There never had been any bar in federal laws to the service of osteopathic physicians in the medical corps of the army or navy. But neither had there been expression of congressional recognition of eligibility until 1941, when the Military Appropriations act authorized employment of osteopathic interns in army hospitals, looking toward commissions in the medical corps.

The osteopathic colleges were represented in the National Council of Defense Committees of Colleges and Universities in February, which discussed educational institutions in preparedness. Curricula of osteopathic colleges were modified, and courses added, in view of current developments.

In view of health needs, the Office of Production Management recommended to the Selective Service system the deferment of osteopathic physicians and students, but many osteopathic physicians voluntarily entered service, from the officers' reserve corps, the national guard, or directly. They were active also in civil defense councils, and in the home guard, and under the Selective

Service law, serving as draft board members and examiners, as members of medical advisory boards, etc.

Numerically and institutionally, osteopathy advanced. The total number of osteopathic hospitals was increased from 132 in 1940 to 145 in 1941; accredited for training interns, from 27 to 33. The American Association of Osteopathic Colleges set up a council to correlate research activities. Electromyographic research into the nature of the osteopathic lesion was reported in the *Journal of Neurophysiology*. The College of Osteopathic Physicians and Surgeons, Los Angeles, Calif., announced a more comprehensive system of graduate and postgraduate education than any previously undertaken. (R. G. HU.)

Ostland: *see* ESTONIA; LATVIA; LITHUANIA; POLAND.

Osumi, Mineo, BARON (1876–1941), Japanese admiral and supreme war councillor, member of an old noble family, was born in May at Aichi-ken. He was graduated from the Japanese naval academy in 1897 and was Japanese naval minister in 1931, 1933 and 1936, the year that Japan denounced the London-Washington naval pact. At that time he pressed Tokyo to join the shipbuilding race, regardless of the expense. He ranked next to the late Prince Saionji as the most outstanding leader of Japanese liberalism. Admiral Osumi was killed in the crash of a naval plane in Kwangtung province, China, in February while inspecting the Chinese war front.

Ottawa. The capital of the Dominion of Canada (*q.v.*) and the seat of the supreme court, is situated on the right bank of the Ottawa river near the mouth of the Rideau, both rivers having very beautiful falls. The city itself is divided into an upper and a lower town by the Rideau canal. The parliament buildings are situated on a series of high bluffs which overlook the river, in one direction toward the Chaudière falls and in the opposite direction toward the Rideau falls. The population of the city was 149,881 in 1941.

The gross value of manufactured products in 1940 was $26,482,490.

Its most important educational institution is the Université d'Ottawa.

BIBLIOGRAPHY.—*Handbook of the City of Ottawa; The Canada Year Book, 1941.* (J. C. HE.)

Outdoor Advertising: *see* ADVERTISING.
Outer Mongolia: *see* MONGOLIA.

Oxenham, John (? –1941), British author whose real name was William Arthur Dunkerley, was widely known as a writer of popular verse under the pseudonym of Oxenham. His volumes of war poems written during World War I were best sellers, especially his *Hymn for Men at the Front,* which reportedly sold 8,000,000 copies. Among his other works were *A Saint in the Making; The Hidden Years* (1931); *Anno Domini* (1932); *God and Lady Margaret* (1933); *Christ and the Third Wise Man* (1934).

He was reticent about his age, but was believed to be over 80 when he died on Jan. 24 at his home, High Salvington, near Worthing, Sussex, Eng.

Oxford University. The academic year 1940–41, which began with upwards of 2,750 undergraduates in residence, ended with 2,941. The number of men matriculating in Hilary (141) and Trinity (287) terms was far above the normal. This was doubtless due largely to the facilities given to men liable to be called up for national service to begin their courses in any term, and to their desire to get the best balance possible between school and university education.

The degree-giving examinations in all except medical and other scientific subjects (students of these subjects are normally reserved from military service to complete their courses) were divided into two shortened "parts," each representing a normal academic year's work, and were subdivided into "sections" which could be taken at the end of Michaelmas or Hilary term. Thus, however suddenly a man was called up, he could count on being able to record his progress up to date.

Most university scholarships and prizes remained suspended, but college scholarships were mostly awarded as usual.

Benefactions received during the year included £25,000 from Lord Nuffield to promote research in ophthalmology, £14,600 under the will of the late Dr. G. H. Fowler for the foundation of a readership in ancient Icelandic literature and antiquities, and £10,500 under the will of the late J. B. Lockey to be devoted to the interests of science.

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Pacific Islands, British. Territories of the British empire in the Pacific ocean, of which certain statistics are given in the table on page 501. *See* BRITISH EMPIRE for population, capital towns, status and governors.

History.—Precautions of defense undertaken by the British Pacific islands in 1941 were redoubled after the outbreak of war in the Pacific Dec. 7. The war had not touched most of the islands by the end of the year, although the mandated island of Nauru, south of the Japanese Marshalls, was reported occupied by Japan Dec. 8. (*See* WORLD WAR II.)

In Fiji the budget rose in 1941 to the record of £1,034,742, compared with £835,887 in the previous year, and increased taxation was imposed. Defense was a main item of expenditure, for though Fiji's annual contribution of £5,000 towards imperial defense had ceased at the outbreak of war, this relief had been far outbalanced by her accepting entire responsibility for local needs. The 1941 revenue from the comparatively recent mining industry was estimated at £58,000, mainly from royalties; and it was announced that from the start of the industry in 1935 to 1940 inclusive the value of gold produced amounted to £2,782,609; it gave employment in 1941 to 2,000 natives and prospecting during 1941 caused expectation of the opening of new mines. Natives were trained as wireless operators, and at the medical school at Suva, supported by the Rockefeller foundation, about a dozen students graduate annually, after a four-year course, as practitioners in Fiji and the other Pacific islands.

Further evidences of progress were construction of aerodromes on Fiji and Tonga for the accommodation of Pan American Airways and of a British transpacific service when this was able to operate; the establishment at Sydney of a joint copra board which, while it assisted this important Pacific islands industry, did not in any way extend Australia's control over the islands' economic life; and the fact that Papua by 1941 was supplying Australia with some 15% of the latter's total rubber consumption.

In 1941 compulsory military training was in force for all men from 18 to 36 throughout the islands, and Fiji had an efficient and well-equipped home guard; every island contributed generously to the Red Cross, Spitfire, and other funds; and in the condominium of the New Hebrides, which was the first part of the French colonial empire to swear allegiance to Gen. de Gaulle, the postage stamps were surcharged "France libre."

Fiji experienced a bad hurricane in Feb. 1941, soon after the Archbold U.S. scientific expedition had left the island. In April

Pacific Islands, British

Territory and Area Square Miles	Principal Products	Imports and Exports (in thousand £)	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary
FIJI, 7,055	(exports 1940) sugar £F. 1,285,191 copra £F. 125,063 gold bullion £F. 1,024,923 bananas £F. 41,747	(1940) imp. £ Fiji 1,826 exp. £ Fiji 2,679	(1939) rev. £ Fiji 931 exp. £ Fiji 1,096	(1939) schls., 393; schlrs., 29,718 (1,647 Europ., 19,444 Fiji, 8,627 Asiatics
PAPUA (administe ed by the Commonwealth of Australia; *see also* PACIFIC ISLANDS, MANDATED) 87,786 (mainland); 2,754 (islands)	(exports 1939-40) rubber £152, 87 gold £135,879 copra £45,568	(1939-40) imp. 826.4 exp. 510.7	(1939-40) rev. £A. 177.9 exp. £A. 178.3	Mission schools with compulsory attendance for native children (1939-40) Europ. schls., 3; schlrs., 63
GILBERT AND ELLICE ISLANDS COLONY (including the Gilbert group; the Ellice group; Ocean island [seat of administration]; Fanning, Washington and Christmas islands; and the Phoenix group*) *c.* 200	(metric tons) natural phosphates (1939) 325,000 copra (1938) 4,900	(1937-38) imp. 207 exp. 351	(est. 1939-40) rev. 73.1 exp 82.7	(1939) schls., 236; schlrs., 6,828
NEW HEBRIDES (a condominium administered jointly by the British and French Governments †) 5,700	(1938) (metric tons) copra 11,600 cocoa 1,900	(1939) imp. 118.6 exp. 123.9	(1939-40) rev. 24.3 exp. 22.7	Numerous Presbyterian and Catholic mission native schls., 1 Fr. Govt. schl., and 1 Catholic mission schl. for whites
BRITISH SOLOMON ISLANDS PROTECTORATE, 11,458	(1939-40) copra 21,944 tons	(1939-40) imp. 186.9 exp. 180.9	(est. 1939-40) rev. 58.9 exp. 73.6	(1937-38) elem. schls., 6; schlrs., 4,697
TONGAN ISLANDS PROTECTORATE. *c.* 250	(exports 1940) copra 7,316 tons bananas, 29,069 cases	(1940) imp. 76.3 exp. 62.2	(est. 1939-40) rev. 67.7 exp. 78.9	(1940) schls., 125; schlrs., 9,324

*Canton and Enderbury Islands, in the Phoenix group, are shared with the U.S.A. under the Anglo-American pact, Aug. 10, 1938.
†New Hebrides adhered to the Free French cause of General de Gaulle in 1940.

a U.S. naval squadron, consisting of the cruisers "Chicago" and "Portland" with a number of destroyers, under the command of Rear Admiral Newton, visited Suva. (L. H. D.)

Pacific Islands, French.

The latest statistics available in 1941 for this French colony are given herewith: area (Society, Tuamotu, Tubai and Marquesas isls.), 1,540 sq.mi.; pop. (est. Dec. 31, 1938) 45,000 (whites, *c.* 3,700). Chief town: Papeete (in Tahiti), cap., 8,460. Governor: Commandant Georges Thierry d'Argenlieu.

Finance.—(1939): local budget (est.) 27,560,000 francs.

Trade and Communication.—Imports (1939) 80,482,000 francs; exports 63,536,000 francs; roads (1937): Tahiti 48 mi.; Raiaeta 19 mi.; shipping (1938) cleared, 162,927 net tons.

Production.—(1939): copra 23,000 metric tons; natural phosphates (export) 161,000 metric tons. (*See* also FRENCH COLONIAL EMPIRE.)

Pacific Islands, Mandated.

The former German possessions in the western Pacific comprise part of New Guinea with adjacent archipelagos, Western Samoa, the Marshall, Caroline, Palau and Ladrone, or Marianne islands, and the islet of Nauru. Statistics for these territories are given in table at bottom of page. For capital towns and governors of New Guinea, Western Samoa and Nauru, *see* BRITISH EMPIRE.

Mandated Pacific Islands

Territory and Area Square Miles	Population and Status	Principal Products	Imports and Exports (000's omitted)	Revenue and Expenditure (000's omitted)
NEW GUINEA, mandated territory (69,700) ncluding Bismarck Archipelago (19,200) and Solomon Is (4,100)	(1939) native 627,283; European 4,327; others 1,930. Under mandate of the Commonwealth of Australia	Exports: gold (1939) 7,500 kg. Copra (1938) 74,400 metric tons	(1937-38) imp. £1,611 exp. £2,980	(1937-38) rev. £A506 exp. £A500
WESTERN SAMOA (1,133)	(1940) 61,240 (white 410) Under mandate of New Zealand	(Export 1939) copra 12,700 metric tons; bananas £74,965	(1939) imp. £195 exp. £220	(1939-40 rev. £131 exp. £136
MARIANNE IS., CAROLINE IS., PALAU, and MARSHALL IS. (811)	(1936) 107,137 (Japanese, 56,406) Under Japanese mandate	cane sugar (1937-38) 74,500 metric tons; phosphates (export 1938) 104,000 metric tons	(1936) imp. 13,866 yen exp. 25,108 yen	(1939) rev. 9,904 yen exp. 9,675 yen
NAURU (8)	(1940) 3,460 (European 171, Chinese 1,512). Under British mandate, held jointly by Great Britain, Australia, and New Zealand; reported occupied by Japan, Dec. 1941	natural phosphates (export 1939) 955,000 metric tons	(1939) imp. £A170.6 exp. £A605.9	(1939) rev. £A33.0 exp. £A29.4

Pacific Relations, Institute of.

The institute is a private international organization founded in 1925 for the study of the peoples of the Pacific and their mutual relations. It conducts an extensive research and educational program and publishes its studies through an international publications office, its national councils and its quarterly, *Pacific Affairs*. Since 1937 it has carried on an international "Inquiry into the Sino-Japanese War," twenty volumes in the series having been issued. The last international meeting of the institute was held at Virginia Beach, Va., in Nov. 1939.

The chairman of the Pacific council, the institute's international governing body, in 1941 was Professor Philip C. Jessup, and its secretary general, Edward C. Carter. The International Secretariat was temporarily located at 129 E. 52nd street, New York city.

Prior to the outbreak of war the institute consisted of eleven active national councils in the following countries:

Australia, Canada, China, France, Great Britain, Japan, the Netherlands, New Zealand, the Philippines, the U.S.S.R. and the U.S.A.

As of the end of 1941, however, the French and Netherland councils were inactive and contact with the Japanese council was totally suspended.

The chairman of the institute's American council in 1941 was Dr. Ray Lyman Wilbur and its secretary, W. W. Lockwood. During the year the council continued its fortnightly periodical, the *Far Eastern Survey*, issued a number of volumes and a series of popular pamphlets.

Its educational work included far eastern seminars for teachers and round table discussions in Boston, Cleveland, Chicago, Des Moines, Honolulu, Los Angeles, New York, Princeton, San Francisco, Seattle, Spokane, Syracuse and Victoria.

A radio program with the title "Spotlight on Asia" was inaugurated through the facilities of CBS.

The council's nationwide activities centred in Honolulu, the Pacific northwest, Chicago, New York, Los Angeles and San Francisco.

Among its other activities the San Francisco division continued and enlarged the circulation of its fortnightly news summary, *Inparel*. (K. GE.)

Pacifism. While some pacifists in 1941 rejected war under every circumstance (the so-called "absolutist" pacifists) the majority of pacifists wished to create a system of international law for the settlement of all disputes between nations, backed by the necessary power to enforce peace. These pacifists believed in the necessity for a common defense against the forces of aggression, because only in such a way the forces of aggression could be stopped. Therefore they would participate in wars of defense, but they did not restrict the word defense to the narrow defense of what is called or what appears at the moment as national self-interest. Absolute pacifists, on the other hand, refuse military service as "conscientious objectors." While fascist countries did not recognize the rights of conscientious objectors, their rights were fully recognized and preserved in Great Britain and in the United States. They had the right to argue the sincerity of their convictions before special tribunals and be then assigned to noncombatant service and thus be exempt from military duty. In spite of the fact that Great Britain had been since 1939 involved in a life and death struggle, it put no restrictions on pacifist propaganda.

Pacifists evolved several schemes for a pacifist world order after World War II, and a number of committees in all democratic countries, especially in Great Britain and the United States were at work to lay the basis for such a peaceful world order. Among these plans the proposal of *Union Now* made by Clarence Streit for a federation of all democratic nations found itself widely sponsored. In Washington, D.C., citizens of 16 nations met in June 1941 to form the "Free World Association" with headquarters in New York city. It published a monthly *Free World* and wished to prepare a world organization which would organize for a concerted peace effort to establish a lasting peace on democratic foundations after the victorious conclusion of World War II. As the year 1941 drew to its end and as practically the whole world was drawn actually into a declared war, the conviction spread that World War II would result in either the establishment of a world order on the basis of Hitlerism and its principles which disregard and despise peace, or in a world federation in which all peoples of good will would share and which would maintain peace as the highly desirable goal of political human development, made possible by the concerted effort of all peace-loving peoples. On the 150th anniversary of the bill of rights, Federal Union submitted a petition to the president for forming a powerful union of free peoples to win the war and the peace by a gradual and peaceful extension of the American principles of federal union to all peoples willing and able to adhere to them as the nucleus of a universal world government of, by and for the people. (*See* also INTERNATIONAL LAW; RELIGION; UNION NOW.)

CONSCIENTIOUS OBJECTORS completing work on their home-made library at Camp Patapsco, Md. in 1941

BIBLIOGRAPHY.—*The World's Destiny and the United States.* A Conference of Experts in International Relations, publ. by World Citizens' Association (1941). (H. Ko.)

Paderewski, Ignace Jan (1860–1941), Polish pianist, composer and statesman, was born Nov. 6 at Kurylówka in Podolia, then a province of Russian Poland. For his career, see *Encyclopædia Britannica.* Paderewski's 20th and last concert tour in the United States ended abruptly in May 1939, when he collapsed from a heart attack in Madison Square garden, where he was scheduled to appear in a concert. A few days later he returned to his home in Morges, Switzerland, to convalesce, but the nazi invasion of Poland in Sept. 1939 again drew him into the arena of European politics. Paderewski immediately voiced full approval of Col. Beck's foreign policy, but later declined an offer to assume the presidency of Poland after the flight of Mościcki. In Dec. 1939 he joined the Polish national council, and in Jan. 1940 he accepted the presidency of the Polish parliament in exile, then sitting in Angers, France. Ill health, however, prevented his attendance at the diet's sessions and he again returned to Switzerland. In late 1940 he left for the United States and resided in New York, where he was active in Allied causes. He died of pneumonia after a short illness in New York city, June 29.

Page, Irvine H. (1901–), U.S. clinical research chemist, was born Jan. 7 in Indianapolis, Ind., and received his M.D. from Cornell university in 1926. He served his internship at the Presbyterian hospital in New York city and was then chief of the chemical division of the Kaiser Wilhelm institute in Munich, 1928–31. Upon his return to the U.S., he was associate member of the Rockefeller Institute hospital, 1931–37, and in 1937 became connected with the Lilly Laboratory for Clinical Research, Indianapolis City hospital, where he conducted investigations in high blood pressure. In April 1941, Dr. Page reported to members of the American Physicians college that he had obtained "distinctly encouraging results" in the treatment of high blood pressure with a purified renin extract from the kidneys of cattle. He said the problem of producing the extract in sufficient quantity to make its use widespread had not been solved. Dr. Page also stated that if the extract was available, thousands of high blood pressure cases (the annual mortality rate in the U.S. is 375,000) would be greatly improved. The substance is found in normal human kidneys, but when the kidneys fail to produce a sufficient quantity, arterial pressure mounts to dangerous heights.

Paget, Bernard Charles Tolver (1883–), British army officer, was born Sept. 15, son of the bishop of Oxford. He was educated at Shrewsbury school, served in World War I as a brevet major, was made a companion of the Distinguished Service order and received the Military cross and the Italian silver medal for military valour. He was commandant of the Staff college of Camberley, 1938–39, and was named commander of the college in 1939. In May 1940, he directed the successful withdrawal of the British force in the disastrous Norwegian campaign, and in the same month he was appointed chief of the general staff of British home forces.

Lt. Gen. Paget was made commander in chief of home forces on Nov. 18, 1941, to succeed Sir Alan Brooke (*q.v.*).

Pahlevi, Mohammed Reza (1919–) shah of Iran, was born Oct. 26 in Tehran. He was educated in Switzerland, was thoroughly schooled in military training and commanded his own regiment while in his teens. In Sept. 1941 his father, Reza Shah Pahlevi, failed to answer with sufficient dispatch British and Russian ultimatums to oust all axis nationals from Iran. As a result, troops from both countries overran Iran and Reza Shah renounced the throne in favour of his 21-year-old son, on Sept. 16, 1941. (*See* also IRAN.)

Painting. War and art have never been congenial bedfellows. In Europe, the first two years of World War II proved no exception. During that period many important artists, faced by the impossibility of working freely in their native lands, found their way to the United States. At the same time, much of the U.S. attention formerly accorded European art was turned toward work nearer home, or at any rate within the western hemisphere. Exploration of this latter field had been given generous official encouragement to the end of cementing a firmer cultural unity among the Americas. And art in the United States, during 1941, showed definite consequences of these developments. The presence of certain European artists whose work had been well known for years, and the work they were exhibiting, contributed a new immediacy to their influence. Hispanic-American work encouraged a boldness of colour and expression tonic to U.S. conservatism.

Certain of the European artists, notably the sculptor Jacques Lipchitz, caught attention with new work equal or superior in quality to that of any similar period of their production in Europe during the previous three decades. Central and South American group exhibitions brought to light the talent of several little recognized artists working in the United States in various centres along the Atlantic and Pacific seaboards. In the end, however, the most striking feature of the year in American art was the distinct advance in quality evident in native work; on one hand, the vitality shown by certain well established men, such as Max Weber, adding to their breadth and stature as artists; and on the other hand, the confirmation of younger reputations, as in the case of Julien Levi, and the appearance of several new figures of substantial promise.

Among the older men the most striking work shown in 1941 was unquestionably that of Max Weber. His large New York exhibition was the outstanding contemporary American one-man show of the year. Sensibility and an extreme subtlety and sophistication of technique were the keynotes of several large rooms of oils. A new freedom of brushwork marked his most recent expressions; a richer, deeper gamut of colour, sonorous, intense, yet under complete control; purples, greens, deep reds; a religious expression, with the haunted oppressive sadness of Hebrew music. In the latest work Weber had completely personalized his expression, returning for inspiration from the Paris of his brief apprenticeship between 1905 and 1908 to his racial background of generations. Through this exhibition he proved himself one of the leading figures in U.S. painting, for sensibility, individuality, technical mastery and emotional expression.

Weber's New York exhibition was followed almost immediately by wide national acknowledgment of the quality of the work it included. In Philadelphia Weber was awarded the Temple Gold medal by the Pennsylvania Academy of Fine Arts; in Washington, D.C. the $1,000 prize by the Corcoran gallery; and the Ada S. Garrett prize at the Art Institute of Chicago.

Another prominent prize winner of the year was Franklin Watkins, the winner of the Pennsylvania Academy of Fine Arts Beck award for portraiture, with his painting "Misses M. and M. deS." Watkins' baroque, dramatic compositions, such as "Suicide in Costume," and his delicate still lifes, had been widely recognized for several years; 1941 saw him also take a definite place in the forefront of U.S. portraiture.

Among the muralists, Anton Refregier won the $26,000 award of the section of fine arts competition to decorate the new San Francisco post office. At the New York World's Fair in 1939, Refregier had carried off first honours for his outdoor murals on the Federal Works agency building. In 1935 he painted the murals for the children's ward at Greenpoint hospital, New York. In San Francisco the decoration was to be constituted of 27 mural paintings for the 208-ft. main lobby and the 34-ft. "L"-shaped lobby opening into it. In these murals the artist was to tell the story of San Francisco in casein tempera to be painted directly on the walls.

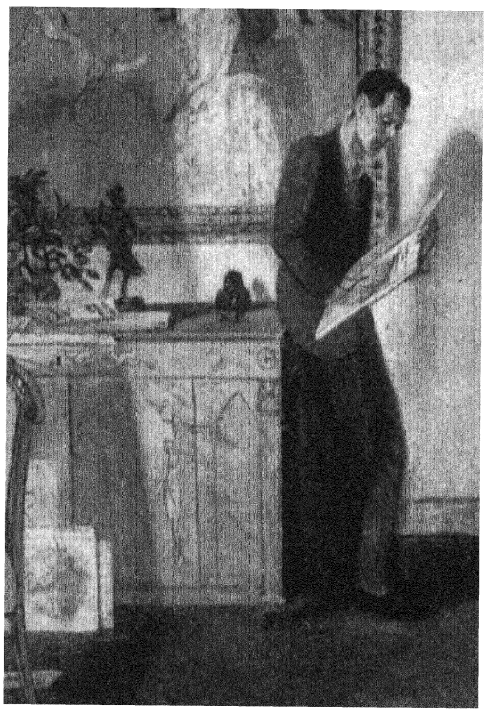
Probably the most striking one-man exhibition of the year after that of Max Weber was Charles Burchfield's large show of water colours. In these there was a notable brightening of expression over his work of previous years. No drama was sacrificed—the tones merely spoke out with a new clarity. For his "House of Mystery" Burchfield was awarded the 1941 Blair prize at the Art Institute of Chicago.

John Marin was another of the well known leaders whose 1941 exhibition showed a steadily growing mastery of his medium. Marin's work, as in the previous two years, was again principally seascapes in oil. But just as each of his 1939 and 1940 pictures in turn marked an advance over the other, Marin's work in 1941 showed him almost at the point where he found himself as much at home with oils as with water colours. Even the most tempestuous subject matter, and what appeared to be the most frenzied brushwork, steadily offered more and more of that subtle integrity of form that is Marin's extremely personal idiom.

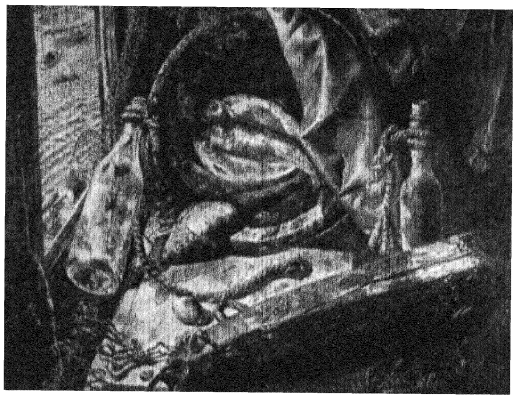
On the other hand, as a water colourist, the caricaturist Adolf Dehn came steadily to the front. The easy amplitude, the green distant slopes and "juicy," storm-laden clouds of his studies promised to put him in the van of U.S. landscapists. Edward Hopper, while his single one-man show of 1941 included only work of the years 1907–14, in isolated water colours and oils throughout the season showed a constantly growing technical subtlety in his characteristic romantic vein. Kuniyoshi and Sheeler likewise continued, without any notable innovations, an even level of quality of their work of the years preceding 1941.

Among the younger men, Julien Levi maintained the promise of his initial one-man show of 1940. Portraiture took a greater place in his work. Still his landscapes and figure pieces of 1941 kept the same qualities that had won him such wide recognition the year before and grew in vibrancy, subtlety and technical brilliance. Peter Blume, whose "South of Scranton" had won the Carnegie award in 1934, but whose work had not in later years been showing the vitality of its earlier promise, in 1941 produced several "Key West" studies in oil quite fresh in conception and execution. Abraham Rattner, better known in Paris than in the United States, won attention with the boldness of his colour handling and the brilliant, assured rhythms of his compositions. Still a trifle too reminiscent of Paris influences, his work showed him to be probably the most promising of the younger men growing out of the School of Paris tradition.

During 1941 among the newer names, Darrel Austin's has probably received the widest recognition. He was born in Raymond, Washington, in 1907. He studied art at Columbia and Notre Dame. Under the WPA he painted murals for the medical college of the University of Oregon at Eugene. He had his first one-man show in 1938 at the Putzel gallery in Los Angeles. Later his work was purchased by several of the leading U.S. museums; one of his strongest compositions, "The Black Beast" (1941), was acquired by Smith College Museum of Art, Northampton, Mass.

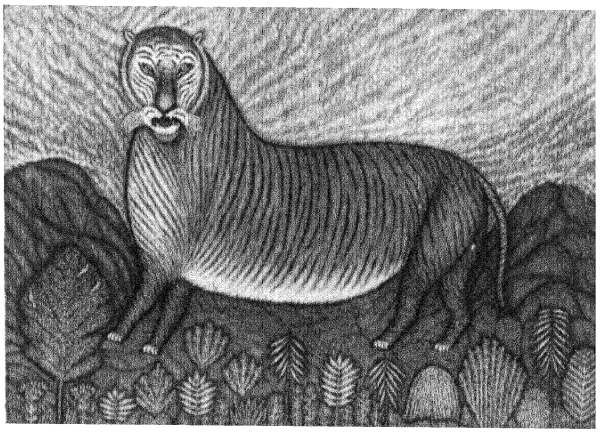


Above: "THE NIGHT CLASS" by Max Weber, whose New York exhibition in March 1941 was an outstanding one-man show of the year

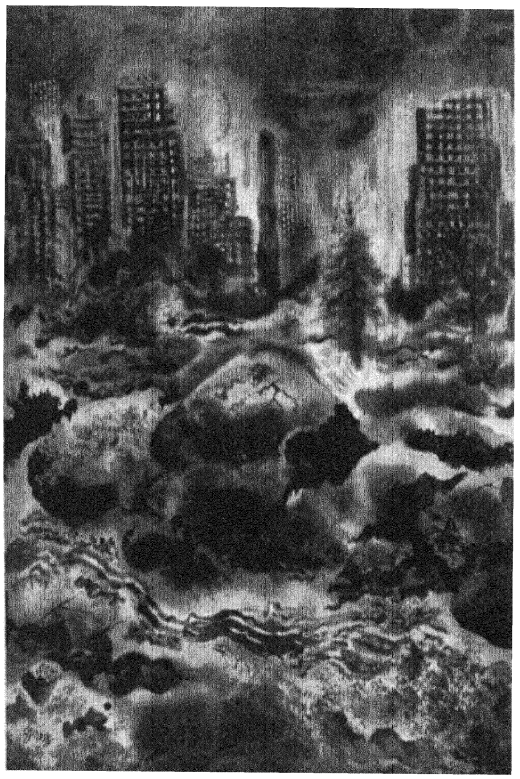


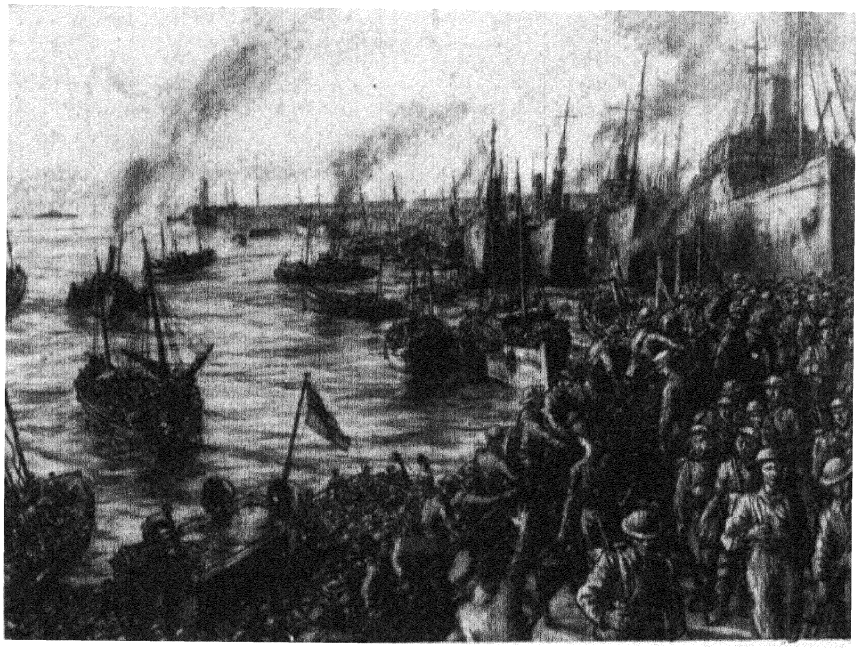
Above, left: "HENRY P. McILHENNY, ESQ.," by Franklin Watkins, painted in 1941. Watkins won the Beck award of the Pennsylvania Academy of Fine Arts in 1941 for his painting "Misses M. and M. deS."

Left: "AH, GOD—HERRINGS, BUOYS, THE GLITTERING SEA," a gouache by Ivan Le Lorraine Albright, was purchased by the Art Institute of Chicago in Nov. 1941



Right: "TIGER," an oil on canvas by Morris Hirshfield, painted in 1940





Above: MUIRHEAD BONE'S "The Miracle of Dunkerque—Arrival at Dover"

Left: "CENTRAL PARK AT NIGHT" by George Grosz, an expatriate German artist living in the U.S.

Two other young artists whose work attracted particular attention in 1941 were Hyman Bloom and Jack Levine, both from Boston. Bloom was born in Latvia in 1913 and emigrated to the United States in 1920. His work has a violent expressionist quality about it, at times too closely reminiscent of Soutine. Still he has an exceptional colour sense, technical ability and boldness of vision. Levine was born in Boston in 1915. Also expressionist in his use of colour and modelling, Levine tends to give an anecdotal emphasis to his subject matter in contradistinction to Bloom's emotional emphasis. And while Bloom also leaned toward Soutine in his early work, his forms later took on a much firmer character without any compromise in his colour effects.

But of all this generation, Morris Graves of Seattle, Wash., probably offered the greatest originality of vision. Graves was born in Oregon in 1910. The Seattle Art museum and the WPA art program, on which he worked for some time, own examples of his work. The technique and the symbolism he employs are peculiarly individual and his work in gouache shows a stubborn persistence in protecting this personal character against external influences.

In the field of sculpture, Alexander Calder continued to offer the most individual expressions in his metal and wood "mobiles" and "stabiles." His large one-man exhibition in the spring of 1941 conveyed a new sense of monumentality in the scale of both small and large pieces. A new dignity marked this group of his work, an increased seriousness of approach to his medium of expression which did not in any way militate against the gaiety of the result. The rhythms of the "mobiles" made no concession to the "expected," yet the architectonic relationships of volumes and planes and the organizations of coloured elements struck a new note of calm and assurance. (*See* also SCULPTURE.)

John Flannagan in 1941 made his first entrance into the Metropolitan Museum of Art in New York with his granite "Goat." He was working for a large one-man exhibition in the spring of 1942 when he committed suicide Jan. 6, 1942. William Zorach continued to hold his position of leadership in the conservative field; while among the experimenters with form and material, Hugo Robus and David Smith attracted most interest.

In the death of Louis Eilshemius in 1941 U.S. painting lost one of its most romantic, if pathetic, figures. A painter all his life, he did not win recognition till well in his 70s when too feeble to enjoy his long-awaited success: a type of American Douanier Rousseau in the stubborn confidence he always had in the eventual recognition of his genius. (J. J. Sw.)

USES OF LUMINOUS PAINT in blackouts were demonstrated in 1941 by Henry S. Prescott of Mt. Kisco, N.Y. This "blacked out" scene shows a girl with luminous necklace, spectacles and flower in her hair, playing checkers

Paints and Varnishes. United States sales of paints, varnishes and lacquers in 1941 valued at $555,398,819, topped the high year of 1929 by 20% and showed the even greater improvement of 35% over 1940 sales. Industrial sales, $227,400,363, showed a 42% gain over 1940 as compared to 25% gain for trade sales coatings.

The impact of World War II affected the formulation of practically all paint and varnish products, in some instances in a drastic manner. Much of the technical effort of the year dealt with the study of replacement materials and additional materials that could be used to make up for shortages and allow for an increase in production demands.

In the pigment field, rutile type titanium oxide was available commercially for the first time. This crystalline form as opposed to the older anatase crystalline form gives a pigment of greater opacity. Either can be used on a calcium sulphate base or as the pure oxide. Increased production of many pigments was announced, particularly in the field of iron oxide yellows which are so important to the production of military finishes as well as of camouflage colours. Zinc chromate reached a position of primary importance due to the requirements of huge volumes of primers for aircraft.

Paint vehicles and varnishes were greatly affected by shortages of not only certain oils such as china wood but of chemicals required for the production of many classes of synthetic resins. Because of the wartime need of nitrogen, much equipment that had been used for the production of methanol, which in turn was converted to formaldehyde, affected the availability of the phenol formaldehyde resins. Limited availability of phenols themselves also restricted the production of resins. Polyhydric alcohols other than glycerine were also the subject of much study, particularly pentaerythritol and mannitol. Pentaerythritol, requiring the use of formaldehyde in its manufacture, was of necessity a limited replacement for glycerine but for the first time commercial quantities of the rosin-ester of pentaerythritol became available as a companion product to the older ester gums. As a worthy companion to these available polyhydric alcohols came the first commercial quantities of polymerized rosin with its greater hardness and stability. Phthalic anhydride, used as a basis of many synthetic resins, was also limited in supply, due to military needs. There was much work done to make the maximum usage of natural resins to alleviate the shortage of the newer synthetics.

Lacquer solvents had their share of attention because of the shortage of alcohols, etc., which are used in the production of military powders. Nitrocellulose lacquer materials were definitely available short of the demand

toward the end of the year.

Resin emulsion paint continued to show improvement and became more favourable among the painter items. Blackout and camouflage paint continued to receive much attention, particularly in the United States. Emphasis was placed on developing paint for which materials would be reasonably available.

In the industrial field finishes were developed which would give even faster schedules in production of implements of war, and to the tools needed in their manufacture. Development of organic coatings to replace metal protective coatings such as galvanized iron was a major problem. Replacements for aluminum paint was a necessary development in the metal protective field. Much thought was also given to the replacement of tin-coated steel so essential to the food packing industry. (A. B. Ho.)

Palaeontology. In the United States, Barnum Brown and Erick Schlaikjer published an extended study of the Upper Cretaceous Mongolian dinosaur *Protoceratops*. Based on a large suite of specimens ranging from embryo to adult, they were enabled for the first time to describe the complete osteology and growth changes of a dinosaur. This contribution is excellently illustrated. A. S. Romer and L. W. Price thoroughly reviewed the Pelycosauria in all its aspects, thus bringing the knowledge of this important reptilian group up to date. The paper is profusely illustrated with 71 text figures and 46 plates. George Gaylord Simpson announced the discovery of jaguar bones and footprints in a cave in Tennessee; in another paper the species of *Hoplophoneus* were reviewed. Of the 11 described species Simpson concluded that 7 are either variants or females of the remaining 4 species. Charles W. Gilmore published a history of the Division of Vertebrate Paleontology in the United States National museum. It covers a period of more than 90 years. All phases of its development, organization, personnel, explorations, exhibits and records are discussed. Charles C. Mook described a new genus and species of the Crocodilia from the Upper Cretaceous of Wyoming.

Erwin Hinckley Barbour and Claude W. Hubbard announced the discovery in Kansas of an incomplete specimen of the shovel-tusked mastodon *Amebelodon fricki*. A detailed study and comparison of the osteology of the extinct aardvark *Orycteropus gaudryi* from the island of Samos, with the modern forms of northern Africa was published by Edwin H. Colbert. It is shown that there has been a progressive increase in size from Lower Pliocene time up to the present. C. Lewis Gazin reviewed the Palaeocene faunas of central Utah, of which three new genera and twelve new species of fossil mammals were described. The discovery of a new fossiliferous locality representing a lower stage nearly equivalent to the Puerco and having a new fauna was announced.

In Manchoukuo, Ruiji Endo described a new genus *Monjurosuchus splendens*, which is regarded as pertaining to the Thecodontia. This specimen comes from the Lycoptera beds in the Lower Mesozoic. In England, Guy E. Pilgrim published an interesting discussion regarding the dispersal of the extinct Artiodactyla. By a process of elimination the conclusion is reached that central Africa is the probable dispersal centre of this great group of extinct mammals.

A CARNIVOROUS DINOSAUR nearly 100 ft. long, believed to be the largest thus far found, was unearthed by an amateur palaeontologist near Edmonton, Alberta, Canada in 1941

Of outstanding importance in research upon invertebrate fossils was Dr. Charles W. Merriam's monographic study of the fossil Turritellas from the Pacific coast region of North America. A total of 95 species, subspecies and varieties (34 new) are described and illustrated. This comprehensive and beautifully illustrated monograph may well serve as a model for other students of invertebrate fossils.

A work of inestimable value to everyone working with Palaeozoic gastropods was Dr. J. Brookes Knight's extended research on the Palaeozoic gastropod genotypes of the world. This work has descriptions and illustrations of all of the genotype species of each generic name proposed prior to 1938. It was found that 80% of the type materials are still available.

L. W. LeRoy published a compact volume on the small fossil foraminifera of the Netherlands East Indies. The article is divided into three parts dealing with as many areas. In all, 326 species and varieties are described, of which 20 are new. The foraminifera range in age from the Miocene to the Pleistocene.

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Palestine. Palestine lies on the western edge of Asia, being bounded on the west by the Mediterranean, on the southwest by Egypt, on the south by the gulf of Aqaba, on the east by Trans-Jordan, on the northeast by Syria and on the north by the Lebanon. Area 10,100 sq.mi.; pop. (est. June 30, 1939) 1,466,500. Chief towns: (pop. est. 1939): Jerusalem (cap. 129,800); Haifa (104,800); Jaffa (77,400); Tel-Aviv (130,300). High Commissioner: Sir H. A. MacMichael, K.C.M.G., D.S.O.; languages: English, Arabic, Hebrew; religions: (1939) Mohammedan 848,933; Jewish 424,373; Christian 114,624.

History.—Between the beginning of April 1941, when the German counterattack developed in Cyrenaica, and June 8, when Free French and British forces crossed the northern frontier into Syria, Palestine seemed for the first time to be directly threatened by the forces of the axis. And in June the invasion of Syria was followed by a number of air raids on Haifa and Tel-Aviv, in which, however, the casualties were not heavy.

The effects of the war upon Palestine's economic life became clearer in 1941. As a result of Italy's intervention in the previous summer, citrus exports, already seriously affected by the loss of many European markets, were brought almost to a standstill. The value of the citrus fruits exported in the first quarter of 1941 was only £P.7,000, as compared with £P.1,162,000 in the corresponding months of 1940. Since in normal years citrus fruits had constituted roughly 80% of Palestine's total exports, and

it was estimated that a fifth of the population was wholly or partly dependent on citriculture, the effects of this calamitous season were widespread. But the same shipping difficulties which cut off Palestine from its overseas markets also provided a compensating protection from competitive imports for some of its producers. Depression on the plantations and in the ports was thus to some extent offset by an increase in the manufacture of consumption goods, both for the civilian population and for the middle eastern army, and in food production. In addition, new demands created by the war resulted in an expanding production of potash and other chemical extracts from the Dead sea, and in the maintenance of the building industry by military contracts.

The government took a number of measures designed either to assist the readjustment of the country's economy to these new conditions or to reduce distress to a minimum. Among the positive measures, the most important dealt with the agricultural situation. Loans, amounting in all to £P.544,000, were again granted to the citrus growers; but they were made in order "to preserve in being a reasonable proportion of the matured and fully efficient groves," and applied only to 37,400 of the 55,000 acres in respect of which applications were received. The government probably took the view that, even in conditions of peace, the industry was threatened with a crisis resulting from overproduction, and the loan for maintaining a limited number of the citrus groves was accompanied by a further promise of £P.100,000 to assist citrus farmers to diversify their activities. Negatively, steps were taken to prevent speculation in foodstuffs; sugar and flour were imported on government account, and in October the government undertook the retail sale of these two commodities in Jerusalem. An attempt was made to keep down the figures of unemployment by suspending immigration from Oct. 1940 to March 1941, and again from April to June. Later, for the period from July 1 to Sept. 30, certificates were issued for 850 families.

Other decisions announced by the government in 1941 were to impose an income tax—this came into effect September 1—and to assume power to prohibit strikes and lockouts, while providing a procedure of compulsory arbitration.

Palestine continued to contribute, in both men and goods, to the war effort of Great Britain and her Allies. At the end of October, 7,985 Jews and 3,383 Arabs were serving with various units of the army in the middle east. In addition to these and to a number of casualties, 1,023 Jews and 421 Arabs had been reported as missing in Greece and Crete. Early in the year a War Supply board was established, to act as intermediary between the middle east command and the Palestinian manufacturers. Its chairman explained that there was no intention of attempting to create a munitions industry in Palestine, which lacked the necessary raw materials and could not import sufficient machines and tools; the object was rather to organize the supply of general stores.

Such internal political activity as existed remained for the most part below the surface. It was clear that the Arab population was pleased by Anthony Eden's speech of May 29, in the course of which he said that the British government would give their full support to any generally approved scheme for strengthening "the cultural and economic ties between the Arab countries, and the political ties too." Among exiled Arab leaders who were now permitted to return to Palestine were Husayn al-Khalidi, the ex-mayor of Jerusalem, and Auni Abdul-Hadi, who returned in July. The only remaining political refugees were the Mufti of Jerusalem and his immediate entourage; the Mufti, after broadcasting in support of Rashid Ali el-Gailani's revolutionary Iraqi government during its armed conflict with Great Britain, eluded British pursuit first in Baghdad and later in Tehran, from where he escaped to Berlin.

Jewish opinion was displeased by the continued refusal of the mandatory power to create distinctive Jewish units in the British army, and by the suspension of immigration schedules. The strength of Zionist feeling on the question of immigration was again illustrated by the report of the commission appointed to enquire into the destruction of the "Patria," a ship on which nearly 2,000 illegal immigrants had been assembled for deportation to Mauritius, in Haifa harbour on Nov. 25, 1940. The commission found that the explosion as a result of which the ship sank was caused by persons on shore who acted out of sympathy with the deportees. (H. By.)

Education.—1938–39, Arab public system maintained by government, 395 schools (12 with secondary sections), 50,020 scholars; Moslem schools, private 181 (2 with secondary sections) with 14,172 scholars; Jewish public schools (1939–40) 407 (including 6 training colleges and 18 secondary, 5 trade and vocational schools) with 56,056 scholars; Jewish private schools 308 (including 22 secondary schools and 2 training colleges) with 25,153 scholars; Christian schools 192 with 23,996 scholars; Hebrew university, Jerusalem (1939–40) 133 teachers, 1,106 students.

Banking and Finance.—Revenue and expenditure (actual 1939–40) revenue £P.6,768,352; expenditure £P.6,004,738; (1940–41) revenue est. £P.8,435,856; expenditure est. £P.8,857,584; public debt (March 31, 1939) £P.4,475,000; surplus balance (April 1, 1939) £P.2,533,265; notes in circulation (June 30, 1939) £P.5,931,967; exchange rate £P.1=£1 sterling=about $4.03 (Dec. 15, 1941).

Trade and Communication.—Overseas trade 1939 (merchandise): imports (excluding military stores) £P.14,632,822; exports, domestic £P.5,117,769; re-exports £P.348,682. Communications and transport: roads (1939) all weather 1,110 mi.; seasonal about 1,100 mi.; railways (1939) 649 ml.; airways (1938): passengers 600, mail 86.9 tons; shipping (1938) entered 1,971 vessels; 5,201,473 net tons. (Dec. 31, 1939) Motor vehicles licensed: 4,362 private cars, 1,157 public cars, 862 buses, 2,688 trucks and vans, 1,158 cycles, 10 tractors; wireless receiving set licences (1938) 35,708; telephone subscribers (1938), number 9,241.

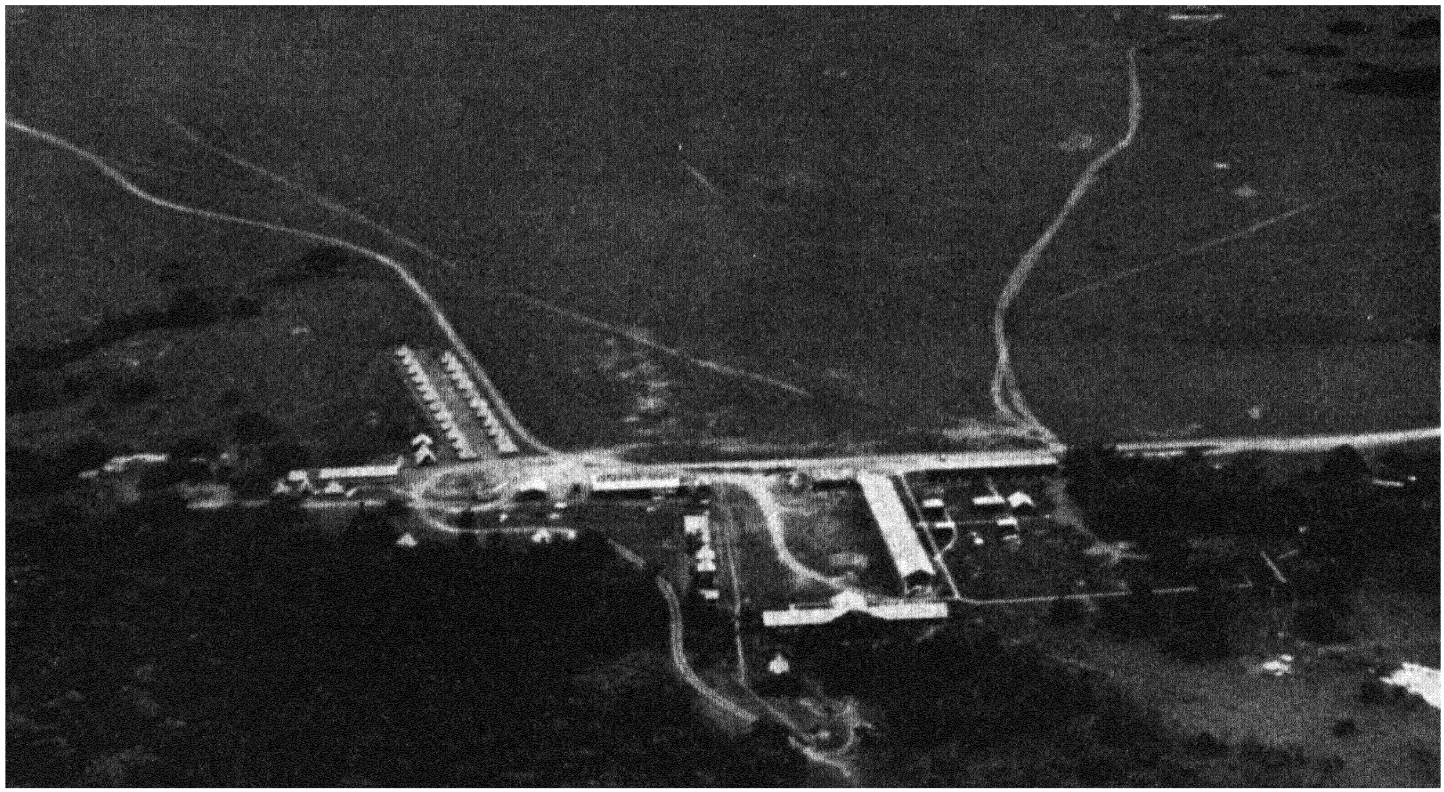
Agriculture and Mineral Production.—Production 1939: potash (exports) £P.381,162; citrus fruits (exports) £P.3,807,570; (in metric tons): barley 78,800; wheat 89,200; olive oil 3,000; maize 6,200; tobacco 500; potatoes 10,400; sesamum 3,800; wine (1938) 30,000 hectolitres.

Panama. A republic at the juncture of Central and South America: area, including the Panama Canal Zone (under United States jurisdiction), 34,169 sq.mi. Returns from the Sept. 8, 1940 census had not been made public at the close of 1941; the total, however, was estimated at somewhat more than 600,000, not including the Canal Zone (1940 census: 51,827). The chief cities are Panama, the capital (1930 census: 82,827; 1941 est., 100,000), and Colón (1930: 33,460; 1941 est., 50,000). President (after Oct. 1941): Dr. Ricardo Adolfo de la Guardia.

History.—The most important development in Panama during 1941, from both internal and external points of view, was the bloodless coup d'état of Oct. 7 which deposed Dr. Arnulfo Arias from the presidency. Behind this event were both domestic and external factors. On assuming office late in 1940, Arias had pushed through a new constitution (effective Jan. 2, 1941), which extended his presidential term and increased his powers. He then embarked upon numerous changes. In the ensuing months his supporters were able to claim among his achievements settlement of the long-standing boundary dispute with Costa Rica, judicial and administrative reorganization, a social security system, agricultural aid through a loan system and a homestead law, and other reforms.

On the other hand, a steadily increasing opposition, headed by the president's brother, Harmodio Arias, former president himself and later a leading editor, charged suppression of civil liberties, including freedom of the press and unfair discrimination against foreigners. The president's policy of defiant antagonism toward the United States, his refusal to co-operate in common defense measures, and his pro-axis declarations and countenancing of axis propaganda were also severely criticized, as was his domineering attitude toward his associates and subordinates.

In March, after considerable pressure from within and without, Pres. Arias granted to the United States permission to erect canal defense outposts in Panama. His refusal, however, in September, to permit arming of Panamanian merchants ships



U.S. AIR BASE at Rio Hato, Panama, outside the Canal Zone. On March 5, 1941 President Arnulfo Arias of Panama granted the U.S. permission to establish bases on his nation's territory to strengthen defenses of the Panama canal

(many of which were United States-owned) roused strong criticism and brought on a serious crisis. A few days later Arias secretly left the country for a brief visit to Cuba, and the opposition took advantage of the fact that his absence was a violation of the constitutional requirement that permission be obtained from the national assembly. On Oct. 9, in strict conformity with the constitution, the cabinet proclaimed Second Presidential Designate (*i.e.*, "second vice-president") Ernesto Jaén Guardia acting president (the First Designate being also out of the country). The cabinet then resigned, and a new cabinet, headed by Dr. Ricardo Adolfo de la Guardia, was installed. Pres. Jaén then resigned, and under the constitution, Dr. de la Guardia became president.

Meanwhile, from his exile, Dr. Arias charged the United States with conniving in his deposition. So, too, did the axis nations. No supporting evidence was presented, however.

Pres. de la Guardia promptly took steps to bring Panama into close accord with the United States, despite thinly veiled threats from Germany and Japan. The ban on armed merchant ships was lifted Oct. 20, and a German diplomatic attaché, accused of heading nazi propaganda activity, and the Spanish ambassador, who had publicly criticized Panama's foreign policy, were expelled. In December, Panama promptly aligned itself with the United States and declared war against the principal axis powers.

Education.—There were more than 600 primary schools in 1941, with some 60,000 enrolment, several secondary schools (nearly 4,000 enrolment), and the National university, with around 500 students, at Panama.

Finance.—The monetary unit is the balboa, equal to the U.S. dollar.

Communication.—Panama had 257 mi. of railway and 726 mi. of highway in 1941, not including a 55 mi. link of the Inter-American highway and the transisthmian highway (connecting Panama and Colón by road for the first time), under construction with completion expected by the end of 1942. Panama's strategic geographic position makes it the hub of inter-American air and maritime transport. The merchant marine is one of the largest in Latin America.

Trade and Resources.—In 1939 imports were $20,464,000, exports (excluding $3,339,000 re-exports) $3,487,000 in value. In the absence of complete official compilations, 1940 imports were estimated at $23,000,000, exports at $4,600,000. The United States supplied $19,070,324 of imports in 1940, 42% more than in 1939, and took $4,279,787 of all exports (1939: $3,851,632, or 85.8% of all exports). In the first nine months of 1941, Panama's imports from the United States alone aggregated $23,663,980 value, 80.7% more than in the same period of 1940, while exports to the United States rose 14%, to $3,342,921. Tourist and ship purchases and Canal Zone trade offset the unbalance between imports and exports. Imports comprise foodstuffs, textiles and miscellaneous manufactures. Domestic exports are mainly bananas (79% in 1939). Some other fruits are grown in quantity, and gold mining is important. The economic bases of national life, however, stem from the canal. (*See* CENTRAL AMERICA; HISPANIC AMERICA AND WORLD WAR II.) (L. W. BE.; L. C. DEA.)

Panama Canal and Canal Zone.

Area, 552·95 sq.mi., of which 190·94 are water; the population, as of the yearly census taken June 30, 1941, exclusive of U.S. army and navy personnel, 42,346, of whom 15,434 were United States citizens. The length of the canal from shore line to shore line is 40·27 mi. and 50·27 mi. from deep water to deep water. Both the canal and Canal Zone are under the jurisdiction of the United States.

The Panama canal connects the Atlantic and Pacific oceans through the narrow isthmus of Panama at approximately 9° N. latitude and 79° W. longitude. It was opened to traffic on Aug. 15, 1914. The canal was constructed because of the distances it saves ocean commerce. Between New York city and San Francisco, the distance of 13,135 nautical miles by way of the Straits of Magellan was reduced to 5,262 by the canal, a saving of 7,873 mi.; from Liverpool to San Francisco the distance by way of the Straits of Magellan, 13,502 mi., was reduced to 7,836 mi., a saving of 5,666 mi. It is estimated that the saving of four days at sea will pay the cost of tolls through the canal, not taking into account the commercial advantages that accrue from the time saved.

During 1941 there was a great increase in local activity in the Canal Zone. The total force employed by the Panama canal and Panama Railroad company in June 1941 was 7,260 on the "gold roll," and 25,994 on the "silver roll." As compared with June 1940 this represents an increase of 2,002 or 38% on the "gold roll," and an increase of 7,103 or 38% on the "silver roll." The terms "gold roll" and "silver roll" originated during the construction period of the canal from the practice of paying the United States skilled labour in gold and paying the native unskilled labour in silver. This classification has been continued, although all employees are paid in U.S. currency. The "gold roll" comprises the supervisory, technical, higher clerical and highly skilled mechanical employees; these employees are, with a few exceptions, citizens of the U.S.

The gross capital investment as of July 1, 1940 was $559,635,-

638, and the net investment, after deducting reserves, $509,170,281. An interest return of 3% on the net capital investment would have been $15,275,108 for the year's operations, or $5,414,330 more than was actually realized.

The increase in local activity evidenced by the increased working force in 1941 was due to the construction activities in the Canal Zone for national defense projects of the U.S. army and the U.S. navy, and the project for the improvement and enlargement of the capacity of the Panama canal by the building of a third set of locks. The latter project involves the construction of a complete new set of locks at Gatun, Pedro Miguel and Miraflores, with by-pass channels paralleling the existing facilities. The size of the new locks will accommodate the largest existing vessels. The length of each lock chamber in the new set of locks will be 1,200 ft., the width 140 ft. and usable depth 45 ft., as compared with the 1,000-ft. length, 110-ft. width and 40-ft. depth of the present locks. The third set of locks will consist of only 6 chambers as compared with the 12 chambers in the existing locks. The flights of locks in the existing sets are duplicate or "double barrelled," and ships may be passed in opposite directions simultaneously. The estimated total excavation for the third locks project is 71,837,000 cu.yd. of material; the estimated total cost for the third locks project is $277,000,000, including appurtenant works.

Revenues for the fiscal year 1941, principally from tolls, totalled $19,474,896 and the net appropriation expenses were $9,614,118, which left a net revenue of $9,860,778, or a return of 1.95% to the United States government on its investment in the canal enterprises.

During the fiscal year ended June 30, 1941, there were 4,727 transits of ocean-going commercial vessels in comparison with 5,370 in the fiscal year 1940. Net tonnage (Panama Canal measurement) of the 4,727 vessels transiting in 1941 totalled 20,642,736, and cargo carried aggregated 24,950,791 long tons.

(G. E. ED.)

Pan-American Highway: *see* ROADS AND HIGHWAYS; *Inter-American Highway.*

Pan American Union.

An international body created in 1891 and maintained by the 21 western hemisphere republics to promote peace, commerce and friendship between the republics by fostering economic, juridical, social and cultural relations. The union is supported by annual contributions from all member countries, in amounts proportional to population. Special divisions deal with trade, economics, agricultural co-operation, juridical matters, intellectual co-operation and other subjects, with an especially well organized division of economic information. Headquarters: Washington, D.C.; director general, Dr. Leo Stanton Rowe; assistant director, Señor don Pedro de Alba.

Among the functions of the union is the sponsoring of inter-American conferences, of both a general and a specialized nature, and the facilitating of the work of inter-American committees and similar organizations. During the year 1941 the union was especially active in promoting inter-American co-operation in the face of World War II. Under its aegis two important regional conferences were held, sequels to the second meeting of the foreign ministers of the American republics (popularly called the Havana conference) in July 1940: the Economic conference of the Río de la Plata at Montevideo in February (*see* URUGUAY) and the third meeting of the Inter-American Union of the Caribbean, at Port-au-Prince in May. Other specialized inter-American conferences during 1941 included a South American railway congress at Bogotá and a Pan American geography and history congress at Lima. The union issues several periodicals as well as numerous irregular publications on special topics of American interest (see below).

The Inter-American Financial and Economic Advisory committee, set up under union auspices in Sept. 1939, having effected a coffee quota agreement in 1940, turned its attention to studies of similar plans for the regulation of cacao and cotton.

Unofficial suggestions were made during the year that, in view of changing world conditions, the Dominion of Canada be invited to become a member of the union. The union itself, however, gave neither official nor unofficial consideration to the proposal.

As the year closed, the union was preparing for the third meeting of the foreign ministers of the American republics, which was scheduled to meet at Rio de Janeiro on Jan. 15, 1942. (*See* HISPANIC AMERICA AND WORLD WAR II.)

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(L. W. BE.)

Paper and Pulp Industry.

The pulp and paper industry in 1941 was approaching wartime economy, with its problems of inflation, priorities, transportation, shortages of materials and high production requirements.

In brief, it was the greatest year in the industry's history from the production standpoint. More than 16,000,000 tons were produced, or 11% more than in 1940 (14,372,000 tons).

Every effort was being made to enable the industry to meet its 1942 production requirements of about 26,000,000 tons, including newsprint and paperboard. In 1941 the production, including these grades, was about 21,600,000 tons. It is interesting to note the 1941 productive capacity of the industry based on a 310-day basis as shown in Table I.

Table I.—*United States Paper Production Capacity for 1941*

Kind of paper	Capacity* (1 ton = 2,000 lb.)
Newsprint	1,080,000
Groundwood	700,000
Book**	2,105,300
Writing	758,000
Cover	30,000
Text	16,200
Sulphite and other wrapping	1,250,000
Kraft wrapping	1,700,000
Tissue	794,000
Paperboard	8,650,000
Building	938,000
All other	260,000
Total	18,280,500

*Including idle mills and equipment.
**Including coating raw stock and machine-coated papers.

In Oct. 1941 the industry was running at 106.7% of capacity. In the 36 years from 1904 to 1940 paperboard production increased 1,070%.

In the same period paper production increased 190%. This increase on the part of paperboard was due to the increased use of packages. In the same period per capita consumption of paperboard increased 630%, while the increase for paper was 93%.

Table II.—*United States Paper Production, 1937-40*
In Short Tons (U.S. Census)

	1937	1938	1939	1940
Newsprint and similar papers	975,854	1,090,000	954,259	1,030,000
Book papers and coating raw stock	1,520,523	1,424,000	1,534,591	1,624,000
Paperboard	5,802,036	5,137,000	6,104,908	6,550,000
Wrapping	2,053,387	1,897,000	2,238,903	2,350,000
Writing	578,147	510,000	594,594	625,000
Cover	24,437	21,500	19,401	20,500
Tissue	546,152	500,000	655,723	720,000
Building	608,086	568,000	635,024	690,000
All other, including absorbent	196,317	180,000	704,124	762,500
Total—all grades	12,304,930	11,327,500	13,512,877	14,372,000

Table III.—*United States Production and Consumption of Paper, Wood Pulp, and Pulpwood (Estimated)*

	Paper Short tons		Wood pulp Short tons		Consumption of Pulpwood (Cords)		
	Production	Consumption	Production	Consumption	Domestic	Imported	Total
1934	9,186,266	11,185,682	4,425,669	5,969,633	5,979,700	817,000	6,796,700
1935	10,506,195	12,490,886	4,944,220	6,877,869	6,590,942	1,037,332	7,628,274
1936	11,670,000	14,456,046	5,695,219	7,420,829	7,506,156	1,209,760	8,715,916
1937	12,837,003	16,055,681	6,573,918	8,692,489	8,377,132	1,572,868	9,000,000
1938	12,860,000	16,000,000	5,034,000	7,506,000	8,194,000	1,030,000	9,221,000
1939	13,493,476	16,000,000	6,903,334	9,003,937	..	..	10,816,466
1940	14,372,000	16,621,000	8,851,740	9,612,588	12,692,000	1,435,800	14,127,800

Table IV.—*U.S. Production and Consumption of Paperboard and Paper*

Year	U.S. population	Production—tons		Per capita consumption—pounds	
		Paperboard	Paper	Paperboard	Paper
1904	82,601,384	559,700	2,546,900	13.6	61.7
1909	90,691,354	883,100	3,238,500	19.5	71.3
1914	97,927,516	1,291,800	3,860,900	26.4	78.8
1919	105,003,065	1,807,100	4,099,000	35.5	78.1
1925	114,807,141	3,286,600	5,895,600	55.5	102.7
1930	123,090,000	4,060,700	6,108,400	65.9	99.1
1935	127,521,000	4,695,900	5,783,200	73.6	90.7
1940	131,669,275	6,550,000	7,822,000	99.6	118.9

Table V.—*Wood Pulp Production* (Short tons)

Kind	1939	1940
Mechanical groundwood	1,444,875	1,762,821
Sulphite		
Bleached	1,217,249	1,561,789
Unbleached	729,203	1,029,895
Sulphate and kraft		
Bleached	424,453	558,872
Unbleached	2,538,204	3,160,263
Soda	441,565	548,047
All other	197,785	224,053
Total	6,993,334	8,851,740

Canada.—The rated capacity of Canadian mills is set at 4,300,000 tons, of which 2,869,266 tons represent newsprint. A new machine was installed in the mill of the Rolland Paper company. There were no other major improvements during the year.

Table VI gives the statistics of wood pulp production and consumption in Canada for 1939, the latest figures available.

Table VI.—*Canadian Production and Consumption of Wood Pulp, 1939*

Material in tons (2,000 lb.)	Production	Consumption
Sulphite, bleached	404,268	105,477
Sulphite, unbleached	624,552	534,726
Sulphate	292,066	184,309
Other / Soda	21,502	12,685
Chemical screenings	27,760	27,760
Mechanical (groundwood)	2,738,011	2,569,380
Mechanical screenings	58,082	47,992
Total, all grades	4,166,301	3,482,329

United Kingdom.—There were no up-to-date statistics available regarding pulp and paper production in the British Isles. In Great Britain there was established a Paper Control board. The size of newspapers was reduced. This was in part occasioned by the urgent need of shipping for other more important purposes. In Australia a similar action for the same purposes was reported.

World Pulp Production.—World statistics may mean little under the disrupting circumstances of war. The 1938 world production of chemical pulp was the latest for which world figures were available.

Table VII.—*World Production of Chemical Pulp*

1938 (thousands of short tons)

United States	4,596	Estonia	87
Sweden	2,620	Lithuania	60
Finland	1,621	Rumania	52
Germany	1,469	Switzerland	50
Canada	1,147	Netherlands	46
Japan	643	Italy	45
U.S.S.R.	600	Newfoundland	41
Norway	502	Latvia	32
Austria	300	Yugoslavia	23
Czechoslovakia	280	Great Britain	16
France	139	Mexico	3
Poland	120		
		Total	14,492

(R.G.M.)

Papi, Gennaro (1886–1941), U.S.-Italian conductor at the Metropolitan Opera house in New York city, was born in December in Naples, Italy. He began his musical education at the Conservatory of San Pietro a Maiella at Naples and was graduated from the Naples Conservatory of Music in 1904. He became assistant conductor at the San Carlo in Naples, 1905, was assistant to Richard Strauss, 1905–08, and assistant to Campanini at Covent Garden, 1911–12. He was engaged by Arturo Toscanini in 1913 as assistant director at the Metropolitan in New York city. In 1916 he conducted his first opera and thereafter he was one of the leading conductors of Italian repertoire at the Metropolitan. He died in New York city, Nov. 29.

Papua: *see* BRITISH EMPIRE; PACIFIC ISLANDS, BRITISH.

Paraguay. An inland republic in southern South America. Area, 154,165 sq.mi.; pop. (1938 official estimate: 954,848) approximately 990,000 in 1941. Capital: Asunción (104,819). Other important cities (with est. pop.) are: Villarrica (20,000); Concepción (11,000); Encarnación (10,000); Paraguarí (10,000). The population is almost entirely Roman Catholic, except for some 10,000–15,000 Mennonites in settlements in the Chaco area. Spanish is the official language, but most of the population outside of Asunción also speaks Guaraní, an Indian tongue. President in 1941: Gen. Higinio Morínigo.

History.—Political discord and uncertainty, accompanied by ironclad censorship and rigorous repression, marked the year in Paraguay. Scrapping of the progressive policies of Pres. José Félix Estigarribia, whose death in Sept. 1940 had brought to power Gen. Morínigo and the army group supporting him, caused two unsuccessful revolutionary outbreaks. Frequent rumours of an attempted comeback by totalitarian-minded former dictator Gen. Rafael Franco (exiled to Uruguay in 1936) failed to materialize.

Paraguay participated in the Río de la Plata regional conference at Montevideo in January (*see* URUGUAY), and in June concluded a comprehensive trade treaty with Brazil (*q.v.*). Relations with the United States, although lacking the cordiality which marked them under Pres. Estigarribia, were friendly, and on Dec. 10 the government announced Paraguayan solidarity with the United States "in the face of Japanese aggression."

Education.—There were nearly 2,000 primary schools in 1941 and a national university at Asunción. Education, however, is backward, since government efforts to expand facilities have failed to materialize, largely because of economic and political uncertainties.

Finance.—The monetary unit is the peso, valued at approximately ½ cent U.S. in 1941 (or 70 to the Argentine peso). The gold peso is used in foreign exchange transactions (value: 60.86 cents U.S. in 1941).

Trade.—In 1940 imports (chiefly textiles, tinplate for canning, foodstuffs and miscellaneous manufactures) totalled 14,832,657 pesos, a 16% rise; exports, 11,385,345 pesos, a 29% decline from 1939. Higher prices of imported goods and lower value of export commodities, both caused primarily by World War II, were responsible for the changes. The main exports were quebracho extract, 32,066 tons (22.1% of export values); canned meat, 9,100 tons (15%); yerba maté, 10,092 tons (12.9%); hides (12.5%); cotton, 19,347 bales (11.1%); lumber (6.1%); petit grain oil, 164 tons (4.5%). Exports went mainly to Argentina "in transit," 36.4% (1939: 44.7%); Argentina 22.5% (14.2%); United States 20.9% (14.7%); Great Britain 12.7% (7.8%); Uruguay 3.2% (2.6%). Latin American areas (including transit goods to Argentina) took 62.4% (1939: 61.6%). Imports were supplied chiefly by Argentina, 45.1% (1939: 37.5%); United States 21.3% (9.7%); Japan 12.7% (12.9%); British empire 8.6% (8.2%); Brazil 3.1% (3.1%).

Communication.—External communication is primarily by the Paraguay river to Buenos Aires (a route virtually monopolized by one steamship company), by rail to Argentina and by air. A railway from Asunción to Guairá, to connect with a Brazilian line already under construction, was being studied in 1941. There were, in 1941, 441 km. of railway. A highway system was being expanded through United States financial and technical aid obtained by Pres. Estigarribia's administration in 1939, at a total cost of $4,000,000.

Agriculture.—Paraguayan resources are agricultural, pastoral and forest.

Under the Agrarian statute of Feb. 29, 1940, provision was made for distribution of land to farmers, establishment of agricultural colonies and the setting of certain minimum cultivation acreage for leading crops, with areas as follows (in hectares): cotton 102,690 (1940–41 actual: 75,000); corn 71,190; mandioca 61,275; beans 26,984; peanuts 15,540; tobacco 7,926; rice 4,633; castor beans 3,850; wheat 1,235; potatoes 374; onions 160. Important crops not affected include sugar (1940 production: 12,447 tons), coco-nut oil and tung oil (1940 was the first important producing year of the latter). Cattle are raised extensively, with canned meats and meat extracts an important export item. Quebracho, source of tannin, is the leading forest product, with Yerba maté and petit grain oil next in importance.

Manufacturing.—Industry is chiefly textile manufacture, flour milling, and tannin extraction. (L. W. Be.)

Parents and Teachers, National Congress of.

The National Congress of Parents and Teachers, represented locally by parent-teacher associations, was established in Washington, D.C., Feb. 17, 1897, as the National Congress of Mothers. The membership, however, for many years included fathers, teachers and other citizens. On April 15, 1941, there were 2,480,188 active members enrolled in 28,050 units in the 48 states, the District of Columbia, Hawaii, Alaska and Puerto Rico.

A special war program was adopted in 1941 and was being translated into activity in all local associations. The program concentrated on the following seven areas of parent-teacher endeavour: Conservation of human and material resources; registration and identification of children; health through nutrition and increased production of protective foods; educational emergency; national victory book campaign; prevention of epidemics through immunization; purchase of U.S. defense savings bonds and stamps.

The *National Parent-Teacher* is the official parent-teacher magazine, issued ten times a year. The *National Congress Bulletin* is sent monthly from September to June to every local association. Among the many publications are the annual convention *Proceedings* and *Schools for Democracy*. The office of the National Congress is at 600 S. Michigan blvd., Chicago, Ill. President (1941): Mrs. William Kletzer of Portland, Ore. (V. M. K.)

Paris. Capital and largest city of France, Paris combines the features of an administrative and cultural centre with those of a large industrial town. Pop. (1936) 2,829,746; of Greater Paris, 4,933,855. On June 9, 1940, when the government, headed by Premier Paul Reynaud, quit the city because of the German advance (the German armies entered Paris June 14) Paris ceased to be the capital. The French government, headed by Marshal Henri Philippe Pétain, was located in Vichy (*q.v.*); Paris remained under German military occupation.

Like the rest of France, Paris lived on short rations as regards both food and fuel, and the people suffered a good deal from cold during the winter of 1940–41. There was a gradual drifting back to Paris, however, of the great numbers of refugees who fled from the city in June 1940; and unemployment, which at one time was estimated to be as high as 500,000, had fallen to about 100,000 by the end of 1941. The Germans encouraged the French factories to continue production and in some cases supplied raw materials from Germany and from German-occupied regions, exacting payment in the manufactured goods of the factories.

Despite the stern reprisals, including the mass shooting of hostages, which were inflicted for acts of revolt against the German military authorities, there were sporadic acts of violence in Paris during 1941. (*See* France.)

There were virtually no taxicabs or automobiles on the streets of Paris, apart from those belonging to the German officers or reserved for certain public services. Horse-cabs and bicycles became more common and the "Métro" (subway) was overcrowded because of the disappearance of other means of transportation. A curfew was enforced from midnight until 5 A. M., and anyone on the streets without special permission was liable to arrest, with the double danger of being treated as a hostage after the practice of inflicting merciless reprisals for attacks on German officers went into effect.

Food rations in Paris during 1941 were generally fixed at less than thirteen ounces of meat per week, a little over thirteen ounces of bread per day, and the following allotments: three and a half ounces of rice, eighteen ounces of sugar, nine ounces of noodles, seven-tenths of an ounce of soap, twenty-eight ounces of fats (oleomargarine, lentils and dried beans), eleven ounces of cheese. The allowance of potatoes was about five pounds a month. Sick persons and young children were allowed to purchase a pint of milk a day.

A card system was introduced for clothing, and there was an extreme shortage of cloth and thread. Tickets entitling the holder to purchase a new pair of shoes were doled out very sparingly, the applicant being required to prove that his old shoes were worn out beyond reasonable hope of repair. Silk stockings were at a premium because of the lack of new supplies and the wear and tear incidental to a mode of life in which walking and bicycling were often necessary modes of getting about.

There were a number of substitutions, pressed strawberry leaves being used as a compensation for tobacco. Some observers compared the bare aspect of Parisian shop windows under the nazi occupation to the impression of Russian shops in Moscow and other soviet cities. Another occasional feature of life in Paris that would recall the days of so-called war communism in the U.S.S.R. was the practice of paying in kind for services in some cases. Artists who took part in a benefit for French war prisoners received as a testimonial for their co-operation baskets of provisions. Each basket contained a duck, a chicken, some artichokes, a pound of mushrooms and two pounds of peaches.

Despite the undernourishment and the many privations of daily life, amusements in Paris went on much as usual. Both the Opera and the Opéra Comique played their regular repertories, and the German State Opera company gave some performances in Paris. Sixty theatres, 66 dance halls and night clubs and 175 motion-picture theatres were functioning in the summer of 1941. Audiences showed a distinct preference for old French pictures to new German films. Such fashionable restaurants as Maxim's, the Lido and the Boeuf sur le Toit were open for business.

A feature of life in Paris during 1941 was feverish speculation in luxuries, at a time when many necessities were short or were entirely lacking. The supply of jewels apparently overbalanced the demand, and prices fell somewhat. On the other hand, paintings, books, furniture and stamps were eagerly sought by purchasers, and some fine pieces of porcelain of the 18th century brought prices of 200,000 and 300,000 francs at the sales in the Hotel Drouot. (W. H. Ch.)

Parity Farm Prices: *see* Agriculture.

Parks and Monuments: *see* National Parks and Monuments.

Parliament, Houses of. The sixth session of the 37th parliament of the United Kingdom of Great Britain and Northern Ireland was opened by the king in person on Nov. 21, 1940, and it was not until many months later, after the destruction of the commons' chamber during the raid of May 10 (*see* London), that an interested public heard that the ceremony had taken place, not—according to invariable precedent—in the house of lords, but (as a rehearsal) in an entirely different building that had been prepared in anticipation of the disaster that eventually overtook the palace of Westminster. The catastrophe can be called so in the material sense only; it had no effect whatsoever on the continuity or on the spirit of the mother of parliaments.

House of Commons.—In the ten months Jan.–Oct. 1941 there were 21 by-elections, with no change in the representation of parties. From the outbreak of war to the same date 69 vacancies had been filled, 23 as the result of contested elections—the official candidates being rejected on two occasions, each time in favour of an unofficial supporter of the government. Before the end of the session an act prolonging the life of this parliament for a further year was passed; of the original 615 members elected in 1935, 147, or nearly a quarter, had been replaced.

Early in the year a simplified procedure had been adopted for determining the existence of a vacancy due to the presumed death of a member through enemy action; and in March, after Malcolm MacDonald had been appointed as high commissioner in Canada, the House of Commons Disqualification (Temporary Provisions) act was passed, which, for the war period only, prevented the disqualification from membership of the house on appointment to any office or place under the crown, on the prime minister's certificate. A select committee was also appointed to inquire into the whole matter of disqualification arising from this or other causes. Besides Malcolm MacDonald, other members serving the state abroad included Sir Samuel Hoare (Madrid), Sir Stafford Cripps (Moscow), Oliver Lyttelton (middle east), Sir Ronald Cross (Australia) and Duff Cooper (far east).

At the beginning of May the ministries of shipping and transport were amalgamated, and F. J. Leathers (who was given a peerage), a prominent industrialist and director of many coal companies, was put in charge; also, a new ministerial office was created, that of minister of state (£5,000 per annum), with a seat in the cabinet but without departmental duties. Lord Beaverbrook (unpaid), until then minister of aircraft production, was its first holder; on June 30, when he became minister of supply, he was succeeded by Oliver Lyttelton, who went to the middle east as the representative of the war cabinet.

House of Lords.—Following the appointment of Lord Halifax as ambassador in Washington, Lord Lloyd became leader in January, and on his death in February was succeeded by Lord Moyne, who also took Lord Lloyd's place as colonial secretary. Lord Addison was leader of the Labour party, and the marquis of Crewe of the Liberal; the chairman of committees was the earl of Onslow. Eleven new peerages were created during the session, two of them for sitting members of the house of commons—Herwald Ramsbotham (then president of the board of education) and Sir Hugh Seeley. One baron (Camrose) was raised to a viscountcy. (*See* also CABINET MEMBERS.) (L. H. D.)

Parmoor, Charles Alfred Cripps, 1ST BARON (1852–1941), British lawyer and statesman, was born Oct. 3. Lord Parmoor, a staunch foe of appeasement, resigned from the Labour party after his son, Sir Stafford Cripps, was expelled from the party in 1939 for his attempts to form a "popular front" in Britain. Lord Parmoor approved the principle of the League of Nations, but deplored the failure of the signatories to make it an effective instrument for peace. He died at his home in Buckinghamshire, Eng., June 30. (*See Encyclopædia Britannica.*)

Parr, Sir (Christopher) James (1869–1941), New Zealand statesman, was born James Christopher Parr, May 18, in Waikato, N.Z. He became mayor of Auckland in 1911, was knighted in 1914 and from 1920 to 1926 served in the New Zealand government as minister of public health, minister of justice, minister of education and postmaster general. He was then high commissioner in London (1926–29), during which period he also represented his government at the League of Nations. Sir James was a leader of the legislative council of New Zealand from 1931 to 1933 and was again high commissioner from 1934 to 1936. He died at his home in Berkhamsted, Hertfordshire, Eng., May 2.

Patents. New and important duties were imposed on the United States patent office by the country's preparations for defense and for actual war. The vital part certain to be played by inventions in the conflict was early recognized. It was accordingly imperative that all applications for patent currently filed or pending should be scrutinized to determine the military usefulness of the inventions they disclosed. A patent office defense committee, composed of examiners familiar with aeronautics, ordnance, explosives and other sources of warlike mechanisms and materials was appointed by the commissioner of patents to perform this task, in which it co-operates with experts of the army and the navy. In addition there was organized a division to decide in what cases licences should be granted to file outside the U.S. applications covering inventions originating in the U.S. These functions were originally fulfilled by the Export Control board. The activities of the defense committee and the division in charge of licensing were increased in volume and significance by the United States' entrance into World War II.

As one of the exigencies of war the patent office was ordered removed from Washington, D.C., to Richmond, Va., to remain there until the return of peace. Those of its sections most intimately related to the evaluation and safeguarding of warlike inventions revealed in applications, those assisting inventors in research, and the solicitor were retained in Washington, D.C.

Applications for patents filed in the year ended Dec. 31, 1941, numbered 69,857. This total was considerably below that for the preceding calendar year. The decrease was in large part attributable to the restrictions and difficulties of exchange and communication confronting inventors in foreign countries, especially those occupied by Germany and Italy.

Receipts of the office in 1941 declined heavily while expenditures mounted. Earnings totalled $3,979,310.16. The filing of fewer applications caused the decrease. Expenses were $4,728,929.94. Their increase was necessitated by the discharge of the additional duties assumed. (*See* also LAW: *Patents.*) (C. P. Co.)

Paxton, William McGregor (1869–1941), U.S. artist, was born June 22 in Baltimore, Md. He began painting at the Cowles Art school and continued at the École des Beaux Arts in Paris, returning to the United States in the early 1890s. He excelled in interiors, and his oils have frequently been compared with the early Dutch masters. Among his better-known canvases are portraits of Grover Cleveland and Calvin Coolidge. Many of his paintings are hung in the Boston Museum of Fine Arts and the Corcoran Gallery of Art, Washington, D.C. He died at his home in Newton Center, Mass., May 13.

Peaches. Unusually large peach crops were harvested in 1941 in all producing areas of the United States except in Iowa, Nebraska and Kansas, where many trees were killed or severely damaged by the low temperatures of Nov. 1940. The 1941

U.S. Production of Peaches in Leading States, 1941 and 1940

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
California			North Carolina	2,760,000	1,344,000
Clingstones*	13,626,000	14,709,000	Alabama	2,464,000	700,000
Freestones	8,626,000	8,876,000	Pennsylvania	2,308,000	2,500,000
Georgia	5,561,000	4,216,000	Illinois	2,254,000	200,000
South Carolina	3,471,000	2,158,000	Texas	2,231,000	2,036,000
Arkansas	3,042,000	2,040,000	Tennessee	2,186,000	264,000
Michigan	2,700,000	1,682,000	Virginia	2,017,000	1,392,000**

*Mainly for canning. **Includes 56,000 bu. harvested but not utilized because of excessive cullage owing to rain damage at harvest time.

crop was 69,610,000 bu., compared to 54,430,000 bu. in 1940 and a ten-year (1930–39) average of 54,356,000 bu. The Canadian crop in 1941 was 873,800 bu.; 787,000 bu. in 1940. In the year ending June 30, 1941, 88,000 cases of canned peaches were exported from the United States. Exports in 1940 were 1,920,000 cases and for the five years ending in 1936 the annual average of such exports was 1,672,000 cases. (S. O. R.)

Peanuts. The 1941 peanut crop for picking and threshing in the United States was estimated by the department of agriculture at 1,474,690,000 lb. This is about 15% less than the record 1940 crop of 1,734,340,000 lb., but almost 40% above the ten-year (1930–39) average of 1,063,374,000 lb. The yield per acre in 1941 was 772·9 lb. In 1940 the yield was 864·1 lb. per acre, and the ten-year average was 713·6 lb. per acre. The acreage in 1941 for picking and threshing, and not including that part of the crop used for forage, was 1,908,000 ac., compared with 2,007,000 ac. in 1940, and a ten-year average of 1,486,000 ac. November estimates by the department of agriculture are shown in the accompanying table.

U.S. Production of Peanuts by States, 1941 and 1940

	1941 lb.	1940 lb.		1941 lb.	1940 lb.
Georgia	488,250,000	577,500,000	Oklahoma	40,825,000	51,000,000
North Carolina	284,760,000	371,000,000	Mississippi	15,515,000	13,500,000
Alabama	224,000,000	205,800,000	South Carolina	13,050,000	23,250,000
Texas	168,000,000	179,200,000	Arkansas	10,500,000	12,100,000
Virginia	157,500,000	216,000,000	Tennessee	6,080,000	6,000,000
Florida	61,100,000	73,320,000	Louisiana	4,510,000	5,580,000

Chinese exports of peanuts to Germany and Japan increased sharply in the first six months of 1941, owing particularly to the European shortage of edible oils, and were 38,800 short tons (shelled) compared with 25,533 short tons in the first six months of 1940. Following the outbreak of war between Germany and Russia such exports to Germany ceased. (S. O. R.)

Pearl Harbor: *see* HAWAII; JAPAN; UNITED STATES; WORLD WAR II.

Pears. The 1941 pear crop in the United States was estimated by the department of agriculture at 30,819,000 bu. compared with 31,622,000 bu. in 1940 and a ten-year (1930–39) average of 27,278,000 bu. The three Pacific states, California, Washington and Oregon, produced 19,650,000 bu., of which 14,069,000 bu. were of the Bartlett variety. The Canadian 1941 crop was estimated at 510,400 bu., a decrease from the 576,300 bu. of 1940. United States exports of canned pears in the year ending June 30, 1941, were 55,000 cases compared with 1,376,000 cases in 1940 and an annual average of 1,619,000 cases in the five years 1931–36. The United States and Argentina made a reciprocal reduction Oct. 14, 1941 on import duties on pears and apples and certain other fruits. The 1941 Argentine pear crop was 3,256,000 bu., an increase of about 23% over that of 1940. From January through June 1941, Argentina exported 576,210 bu. of fresh pears. Swiss production was 8,846,000 bu. in 1941 and 1,276,000 bu. in 1940. The Swiss government fixed prices on fruit to prevent profiteering.

U.S. Production of Pears in Leading States, 1941 and 1940

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
California			Other varieties	2,516,000	2,755,000
Bartletts	8,501,000	7,917,000	Michigan	1,570,000	1,308,000
Other varieties	791,000	1,500,000	New York	1,272,000	1,670,000
Washington			Ohio	840,000	816,000
Bartletts	3,825,000	3,800,000	Illinois	714,000	652,000
Other varieties	2,274,000	2,300,000	Pennsylvania	652,000	873,000
Oregon					
Bartletts	1,743,000	1,600,000			

(S.O.R.)

Peat. Although peat is dug in a number of countries, production data are available only from the United States, where the output is comparatively small—70,097 short tons in 1940, which was supplemented by 21,689 tons of imports. In the past, imports had been greater than domestic production, and only a part of the reduction in imports incidental to war conditions had been offset by increased output. Most of the United States output is used as a soil conditioner, but in Europe peat is extensively used as a low-grade fuel. (G. A. Ro.)

Pellagra. Important to the affected person is the acceptance of the view that the early signs and symptoms of pellagra produce an extremely complex clinical picture. Such early nonspecific symptoms are common to many deficiencies and other diseases. Weakness is an early symptom arising in persons with pellagra, and the muscles of such affected persons contain less nicotinic acid than normal. Manifestations may appear months or years after deprivation of nicotinic acid has started.

Clinical pictures of pure deficiency disease, produced by lack of a single vitamin, rarely occur spontaneously. The following considerations are essential for the treatment of a given case of pellagra: (1) to make an accurate and early diagnosis; (2) to supply nicotinic acid or substances rich in it in sufficient concentration over a long enough period of time so that absorption, utilization and storage will be efficacious; (3) to supply also other essential nutrients in optimum amounts for adequate body function; and (4) to treat coexisting diseases, especially those which might increase the requirement for nicotinic acid. If all persons ate sufficient quantities of lean meat, milk, eggs and fish, and a variety of vegetables, pellagra would tend to become less prevalent. Many persons, however, who can afford such foods fail to consume or utilize adequate amounts, and consequently develop pellagra and other deficiency diseases. (*See* also DIETETICS; VITAMINS.)

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Pemba: *see* BRITISH EAST AFRICA.

Penner, Joe (1904–1941), U.S. comedian, was born Joseph Pinter in Nagechkereck, Hungary, Nov. 11. His family emigrated to the United States when he was three and settled in Detroit, where he spent his youth. Vaudeville and burlesque houses were the early training schools where he perfected his comedy assets—good timing, a nasal laugh and a pathetic shuffling gait. Broadway audiences howled with laughter at Penner's antics, and his favorite expression, "Wanna buy a duck?" brought chuckles from motion picture spectators. But he made his biggest success on radio programs, and in 1934 he was voted the most outstanding comedian on the air. He was appearing in *Yokel Boy* on the Philadelphia stage at the time of his death, Jan. 10.

Pennsylvania. One of the original 13 states of the United States, Pennsylvania is popularly known as the "Keystone state." Area, 45,333 sq.mi. (288 sq.mi. water); population (1940) 9,900,180, of whom 973,260 were foreign-born whites, including 80,111 of German birth and 197,281 of Italian. Capital, Harrisburg (83,893). Cities with a larger population are Philadelphia (1,931,334); Pittsburgh (671,659); Scranton (140,404); Erie (116,955); Reading (110,568); Allentown (96,-

904); Wilkes-Barre (86,236).

History.—The general assembly met in its biennial session in Jan. 1941 and sat for 28 weeks—longer than in any previous year for about a century. One of the first acts provided for a state defense council. Under authority of the act the organization of a home defense guard of 5,000 was ordered. A state housing board of five members was also created. The state was authorized to co-operate with other states in the regulation of the production of oil. Retail and wholesale merchants were forbidden to sell goods at less than cost with a few exceptions. Penalties were fixed for coal dealers who sell short weight. The re-employment of state employees called into military service was guaranteed with half pay up to $2,000 a year while in the service. Participation in elections was forbidden to any group of voters who aim at the overthrow of the state or federal government by force, and all who advocate such measures were barred from public employment. A civil service board was created in the departments of public assistance, unemployment compensation and liquor control. Under the congressional reapportionment act the state's representation was reduced from 34 to 33. The general assembly was unable to agree on the district to be eliminated and adjourned without action. The validity of the state labour law recognizing the right of workers to organize and bargain collectively was sustained by the state supreme court.

In the November election the Republicans elected their candidates to the supreme and superior courts. They also elected 36 county judges to 9 elected by the democrats, and 10 mayors as against 9 elected by Democrats. The Republicans were also victorious in the special election in the 15th congressional district.

The principal officers in 1941 were: governor, Arthur H. James; lieutenant governor, Samuel S. Lewis; attorney-general, Claude F. Reno; treasurer, G. Harold Wagner; superintendent of public instruction. Francis B. Haas; chief justice, William I. Schaffer.

Education.—There were 57 colleges accredited by the state council of education in 1941, including the Pennsylvania state college, a land-grant institution with 6,720 students and a faculty of 624. In addition there were 14 colleges for the training of teachers with 9,007 students. Included in the public school system in 1941 were 9,253 elementary schools, 1,313 secondary schools, 276 special schools, 482 kindergarten and nursery schools and 667 extension and junior colleges. In the secondary schools there were 701,065 pupils; there were 1,119,459 in the elementary schools and 35,006 in the kindergartens. The teaching and supervisory force numbered 35,798 in the elementary schools and 23,525 in the secondary schools. Expenditures for the year were $218,165,051.

Public Welfare, Charities, Corrections.—The average number of WPA employees for the first ten months of 1941 was 96,690, to whom $61,776,000 was paid; old-age assistance to the amount of $2,295,688 was given to 102,347 persons; and $413,497 was paid in pensions to the blind. The average number of unemployed for the first ten months was 1,993,052, to whom $21,886,634 was paid. There were eight penal and correctional institutions maintained at a cost of $3,800,000. The department of public welfare took over control and direction of 12 county hospitals in June, relieving the counties of the cost of maintaining them.

Table I.—*Leading Agricultural Products of Pennsylvania, 1941 and 1940*

	1941	1940
Corn, bu.	56,594,000	53,640,000
Oats, bu.	32,163,000	31,080,000
Barley, bu.	3,969,000	4,030,000
Tame hay, tons	2,834,000	3,328,000
Tobacco, lbs.	53,203,000	49,590,000
Potatoes, bu.	23,674,000	25,570,000
Apples, bu.	9,313,000	9,100,000
Grapes, tons	16,500,000	23,000,000

Communications.—On May 31, 1941, there were 99,716 mi. of highways in the state, 40,510 mi. of which were classed as state roads, and 44,764 mi. as second-class township roads. The remainder included county and village roads. During the year the highway department spent $67,659,104.61, of which $9,132,187.06 was contributed by the federal government. On Jan. 1, 1941, there were 1,636,800 telephones in use. On the same date there were 11,966.33 mi. of main-line railroads in operation.

Banking and Finance.—On June 30, 1941, there were 399 financial institutions under the supervision of the department of banking. The total resources of these institutions were $3,462,256,725.97; deposits were $2,727,660,990.90. At the beginning of the year there were 1,313 building and loan associations with assets of $377,670,929. On Nov. 5, 1941, there were 686 national banks with a total capital of $163,035,000, assets of $4,068,379,000 and deposits of $3,493,273,000.

The general assembly appropriated $331,147,595 for the biennium beginning July 1, 1941, including $98,000,000 for public relief. Estimated receipts from taxation for the period were $414,141,822. The gross state debt on Sept. 1 was $112,929,000; the net debt was $83,101,196.

Agriculture.—The farmers received $5,723,000 in 1940 from the federal government. Table I shows leading crops, 1941 and 1940.

Table II.—*Principal Industries of Pennsylvania, 1940 and 1937*

	Value of Products	
	1940	1937
Metals	$2,944,848,400	$3,058,279,000
Textiles	795,457,200	819,402,500
Food	740,901,600	770,319,300
Chemicals	518,062,300	409,395,500
Paper and printing	372,074,400	350,436,600
Leather	174,963,900	175,288,000
Tobacco products	92,272,300	85,513,300

Manufacturing.—There were 17,366 manufacturing establishments in 1940, employing 1,419,051 persons to whom $1,940,045,800 was paid in wages. The capital invested was $4,223,471,300 and the value of the goods produced was $6,901,966,000. Table II shows principal industries.

Mineral Production.—The Federal Bureau of Mines reported that the value of the mineral production of Pennsylvania in 1939 was $552,355,651, as against $472,773,327 in 1938.

Table III.—*Principal Mineral Products of Pennsylvania, 1939 and 1938*

	Value	
	1939	1938
Bituminous coal	$188,900,000	$160,965,000
Anthracite	187,175,000	180,600,167
Pig iron	186,302,533	101,266,844
Petroleum	36,200,000	32,762,000
Natural gas	35,268,000	29,544,000
Cement	34,332,649	28,242,913

The state department of the interior reported that the production of anthracite for 1940 was valued at $192,539,500 and the value of the bituminous coal for the same year was $218,504,200. On Dec. 31, 1940, there were 81,946 oil wells which produced 17,434,626 bbl. during the year.

(G. W. Do.)

Pennsylvania, University of.

An institution of higher learning at Philadelphia, Pa. It opened its 1941–42 session with an estimated enrolment of 14,276 and a faculty of 1,597. The following changes in the administration occurred during 1941: Phelps Soule, director of the University Press, was appointed secretary of the university, vice Dr. Edward W. Mumford, deceased; Dr. Charles W. David appointed director of libraries of the university; Dr. George C. Vaillant appointed director of the university museum, vice Horace H. F. Jayne, resigned; Rev. J. Clemens Kolb appointed chaplain, vice Rev. W. Brooke Stabler, resigned; Dr. Edwin R. Keedy appointed dean of the law school; Dr. John M. Fogg, Jr., associate professor of botany, appointed dean of the college, vice Dr. William E. Lingelbach, retired; Dr. C. Canby Balderston, professor of industry, appointed dean of the Wharton school of finance and commerce, vice Dr. Alfred H. Williams, resigned; Dr. J. L. T. Appleton, professor of bacteriopathology, appointed dean of the school of dentistry, vice Dr. Charles R. Turner, resigned; Dr. Robin C. Buerki appointed dean of the graduate school of medicine, vice Dr. George H. Meeker, retired, and director of hospitals of the university.

The facilities and resources of the university were made available to the United States government in 1941 for the national defense program. Particularly significant were the research projects carried on in the various branches of chemistry, engineering, medicine, physics, psychology and surgery; 71 of the projects had to do with war problems. The engineering departments and the Wharton school co-operated in a program of training defense workers in factories; several thousand workers were trained under this program. Fifty-four members of the faculty were called to Washington or elsewhere to aid the government in its research program during 1941. (T. S. G.)

Pensions, Army and Navy: *see* VETERANS ADMINISTRATION.

Pepper: *see* SPICES.

Performing Right Societies. Co-operative associations of composers, authors and publishers of music which function as clearing houses for the licensing of public performance of members' copyrighted music. Performing right societies exist in the principal countries throughout the world. They are founded on the principle of copyright law that the right to control the public performance is vested in the owner of music copyright. The extent of this right varies under the laws of different countries. In the United States an unauthorized public performance is not a copyright infringement unless the element of profit enters into the performance.

In certain other countries, where under the law the element of profit is not a consideration, no public performance of any kind may be had of a copyright work without permission of the copyright owner. Chief performing right society of the United States and sole affiliate in the U.S. of the principal foreign societies in 1941 was the American Society of Composers, Authors and Publishers, familiarly known under the alphabetical designation of ASCAP.

A prolonged impasse between ASCAP and radio over prices and method of payment for broadcasting copyright music was reflected for several months of 1941 in limited musical content of radio programs generally. Even before the end of 1940, the major networks began decreasing the proportion of familiar ASCAP music to minimize the expected break of Jan. 1. After that date, radio made generous use of music in the public domain, notably the works of Stephen Foster and familiar classics treated in modern idioms. Radio's chief source of music became Broadcast Music, Inc. (BMI), sponsored by radio interests when the impasse loomed early in 1940. (For further details *see* RADIO: *Musical Property.*)

ASCAP's extensive difficulties from state-by-state legislation waned during 1941. Several such laws had been found unconstitutional. Early in 1941, however, the U.S. supreme court upheld Florida's right to enact a law hostile to ASCAP's operation, although the constitutionality of its enforcement was not in question. Such difficult obstacles arose to the legal use of copyright music in Florida that a truce was called, with state officials agreeing to work for a rescission of the law. A similar situation developed in the state of Washington.

During 1941 ASCAP elected more than 100 members, its total reaching some 1,400. It continued its sponsorship of creative musical activities, such as fellowships for collegians writing prize musical plays and a national competition for amateur musical playwrights, and in some 100 of the leading law schools the now well established annual Nathan Burkan Memorial competition, with a $100 prize in each school for the best copyright law essay.

While ASCAP's radio revenue was largely depleted in 1941, it was expected that in 1942 it would be 20% to 25% less than in 1940.

Principal officers for 1941 were: Gene Buck, president; Louis Bernstein and Otto Harbach, vice-presidents; George W. Meyer, secretary; Gustave Schirmer, treasurer; E. C. Mills, chairman of administrative committee; John G. Paine, general manager.

Persia: *see* IRAN.

Peru. A republic on the west coast of South America and extending into the Amazon basin. Area, 532,185 sq.mi. including some 100,000 sq.mi. in dispute with Ecuador (*See* below). Pop. (June 9, 1940 census): 7,023,111, officially computed as white and mestizo 52.89%, Indian 45.86%, yellow 0.68%, Negro 0.47%, others 0.1%. Capital, Lima (522,826 in 1940). Chief cities: Callao, the port of Lima (69,601 in 1940), Arequipa (est. 60,000), Cuzco (est. 44,080), Trujillo (est. 33,435), Chiclayo (est. 31,609). President (1941) Manuel Prado y Ugarteche.

History.—The most important single factor affecting Peruvian development in 1941 was the century-old boundary dispute with Ecuador (*q.v.*). The controversy, which arose primarily from vagueness of colonial charters and disagreement as to bases of arbitration, involved an area normally regarded as embracing mainly the undeveloped, thinly populated and scantily explored Amazonian slope—a region long under at least technical Ecuadorian occupation. Since 1925 negotiations had been carried on intermittently at Washington, D.C., but owing to internal political uncertainties in both countries, little or no headway was made.

Following border friction in Jan. 1941, Argentina, Brazil and the United States offered mediation, which both countries accepted. Ecuador, however, insisted that any arbitration or mediation include sovereignty over the coastal province of Túmbez, thus reviving a long-dormant claim. Inasmuch as Túmbez had been under effective Peruvian occupation for more than a century and was inhabited by Peruvians (1940 census: more than 25,000, almost entirely white and mestizo), the effect of Ecuador's claim was to arouse strong Peruvian feeling.

By July, border incidents were almost daily occurrences. Peruvian troops expelled Ecuadorian forces not only from disputed points, but from unquestioned Ecuadorian territory as well—assertedly in retaliation for attacks by Ecuadorians.

Meanwhile, pressure on both countries was exerted by mediating nations and others. At length, an agreement was reached (Oct. 2) under which a 15-km. neutral zone, patrolled only by Ecuadorian civil authorities, was created, effective Oct. 10. This arrangement, although transitory, served to prevent further clashes while mediation efforts were continued.

Amid conflicting charges and countercharges, responsibility for the July incidents, as well as for earlier ones, was difficult to assess. In the background, however, lay Ecuador's political instability, which precluded repression of opposition jingoism, along with deliberate nazi stimulation of "patriotic fervor" in both countries in an effort to prevent achievement of continental solidarity.

Peruvian relations to World War II were marked by increasingly cordial co-operation with the United States in hemisphere defense and other measures. In May, upon the scuttling of axis ships in Peruvian ports by their crews, Peru clamped down upon axis agencies, froze German and Italian credits and closed the German Trans-Ocean propaganda agency. Some friction with the United States arose over U.S. seizure for diversion to the U.S.S.R. of Peru-bound bombers on Oct. 15, but the incident was soon closed. When Japan attacked the United States in December, Peru promptly froze Japanese credits and soon imposed strong restrictions on activities of all axis nationals, at the same time granting to the United States the right to use Peruvian ports and other facilities and placing rigid export control on strategic materials.

Internally the country suffered a serious catastrophe when a flood swept the city of Huaráz (est. pop. 24,000) on Dec. 13, with the loss of 500 lives and heavy property damage.

Education.—In 1939 there were 4,727 elementary schools (492,989 enrolment), about 216 secondary schools, several technical schools and five universities.

Defense.—Peru had a standing army of 15,000 and reserves of 100,000 men, a 10-vessel navy and 150 planes in 1941.

Finance.—The monetary unit is the sol, valued at 15.4 cents U.S. during 1941 (1940 average 16.2 cents). The national debt was 925,817,000 soles on June 30, 1941 (external: 546,078,000).

Trade.—In 1940 imports (foodstuffs, textiles, machinery and other manufactures) were valued at $51,668,000 (1939: $47,960,000), supplied mainly by the United States, 53.1% (1939: 41.1%), Great Britain, 9.2% (8.4%), Argentina, 7.8% (5.4%), Japan, 5.8% (3.1%), British India, 3.6% (2.5%), Canada, 3.3% (2.7%) and Italy, 2.5% (2.0%). Exports were valued at $65,782,000 (1939: $71,517,000), to the United States, 42.9% (1939: 30.4%), Great Britain, 12.1% (19.6%), Chile, 10.1% (7.8%), Japan 7.8% (2.4%). Latin-American areas supplied 12% of imports (1939: 9.5%) and took 28.18% of exports (23.9%). The leading export commodities were petroleum and its derivatives 24.8% (1939: 29.0%),

copper 18.5% (17.7%), cotton 17.4% (19.7%), sugar 10.7% (10.8%), ores and mineral concentrates 7.6% (5.8%), gold bars 6.0% (3.6%), wool 5.0% (3.8%). Gold exports in all forms totalled 8,963,110 gr. (1939: 6,873,206 gr.) valued at $10,085,804. In the first five months of 1941, import values rose 6%, export 17%, with Japanese purchases (chiefly cotton) increasing nearly twelve-fold (forty-fold in May).

Communication.—Peru normally has good maritime and excellent air communication (by Pan American airways) with other countries, supplemented by a railway connection with Bolivia. The National Air lines and one private company provide extensive internal air service. The German-owned Lufthansa, formerly operating external and internal service, was grounded by government order early in 1941. The highway system, greatly expanded under a 1937 program, was being extended and improved with direct connections from Lima to the Amazon basin over a 16,127-ft. pass.

During 1941 the newly built port of Matarani, expected to replace Mollendo as the principal sea outlet of the south, was completed, and work was begun on a dry dock at Iquitos, Peru's Amazon port.

Agriculture.—Cotton and sugar are the leading agricultural products, with rice, coffee, maize, wheat, coca and vegetable ivory also important. Cotton production in 1940 was 83,030 tons, domestic consumption 7,360 tons, exports 49,904 (1939: 78,663 tons). In the first nine months of 1941, 69,907 tons were exported, 64.5% to Japan. Great Britain took nearly 37,277 tons in 1939, 22,235 in 1940, while Japanese purchase rose from 8,320 tons to 13,439 tons. Sugar exports were 301,954 tons in 1940 (1939: 272,179 tons), almost half to Chile.

Mineral Production.—Metal production in 1940 (in bars, ores and concentrates) was: antimony 896 tons, bismuth 383 tons, copper 38,557 tons, manganese 222 tons, gold 8,963 kg., silver 573,867 tons, lead 37,072 tons, vanadium 2,167 tons, molybdenum 364 tons, zinc 31,588 tons. Under a 1941 agreement, the United States undertook to purchase all surpluses of Peruvian antimony, copper, lead, tungsten, vanadium and zinc.

Petroleum is found in several sections of Peru, but production centres in the north coastal region. Although it makes up the single greatest export category, the contribution to the material economy is limited, owing to foreign ownership and to the relative isolation of the oil fields. In 1941 estimated production was 12,800,000 bbls. (1940: 12,451,000 bbls.).

Rubber, formerly produced on a considerable scale, languished (1940: 70 tons), but special government studies were made during 1941 preparatory to renewed emphasis. (L. W. BE.)

Pétain, Henri Philippe (1856–), French soldier and statesman. See *Encyclopædia Britannica* for his biography. The venerable marshal was called from virtual retirement in 1939 to become French ambassador to Spain after Franco's triumph in the civil war. He remained in this post after the beginning of war in 1939 until May 18, 1940 when, with France's army falling back in a retreat approaching a rout, he was summoned to Paris to act as vice-president of the government council and adviser to the minister of war. On June 16, 1940, he succeeded Paul Reynaud as premier, and the next day he was forced to sue for an honourable peace. With an energy that belied his 84 years he then began the painful task of reconstruction under the watchful eye of France's conquerors. Moving his government to Vichy July 2, he secured from the national assembly authorization to prepare a new constitution. This task he allotted to Pierre Laval (*q.v.*) whom he named as his successor July 12 (but dropped from the cabinet Dec. 13 "for high reasons of internal policy"). On July 10, 1940, Pétain assumed dictatorial powers until such time as the new constitution was ratified. He had to face not only internal unrest but the external pressures of axis domination, Japanese aggressions in Indo-China, and the "Free French" movement of de Gaulle (*q.v.*). His meeting with Hitler at Montoire Oct. 24, 1940, gave promise of a *modus vivendi* with Germany, as did his appointment of the pro-axis Admiral Jean Darlan (*q.v.*) as vice-premier and next in line of succession in Feb. 1941.

Pétain in 1941 apparently followed a two-way policy in which he alternately submitted to Germany, then resisted German demands for the French fleet and for bases in North Africa. On April 7 he declared that "honour commands that we should undertake nothing against our former allies (Britain)." The next month, however, he approved "in principle" the Hitler-Darlan talks on collaboration.

Again, on Aug. 12, he announced that France would work with Germany in the European new order, and on Dec. 1 he met with Goering in occupied France to discuss collaboration. But in his New Year's address for 1942, he asked Germany for an "attenuation of the status imposed upon us following her victory" if there was to be a "sincere rapprochement between the two nations." (*See* also FRANCE.)

Peter II (1923–), king of Yugoslavia, was born Sept. 6, in Belgrade, the son of Alexander I of the house of Karagjorgjevitch. When Alexander I was slain by Croat terrorists in Marseilles in 1934, Peter succeeded to the throne and a regency headed by Prince Paul (Alexander's brother) was set up to rule until Peter reached his majority. When Premier Cvetkovitch signed an axis pact on Mar. 25, 1941, the army revolted, ousted Cvetkovitch and the pro-axis regency and placed Peter on the throne. The boy king's government refused to honour the axis treaty and announced a policy of strict neutrality. Enraged by this unexpected turn of events, Hitler turned his troops on Yugoslavia, crushing its army in a fortnight. Peter and his government fled to Jerusalem April 21, 1941; two months later they set up a government in exile in London. (*See* also YUGOSLAVIA.)

Petroleum. The spreading of the war to encompass most of the globe, translated into a struggle for oil—a prime requisite of all belligerents—focused attention on the location and production of the oil fields of the world. These are shown in Table I, the production figures being for the year 1940.

Table I.—*World Production of Crude Petroleum, by Countries*

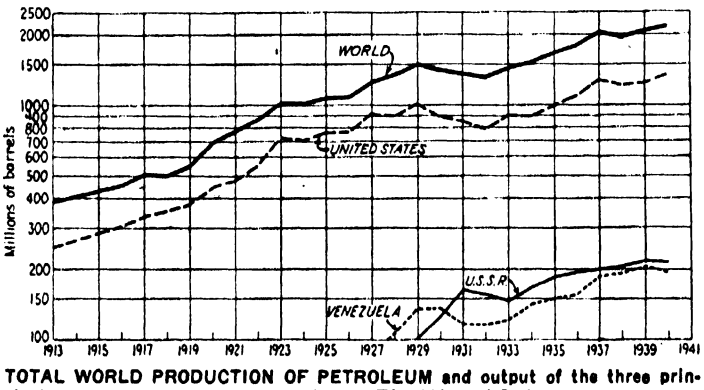
(Thousands of Barrels)

Country	1940
North America:	
Canada	8,955
Mexico	40,350
Trinidad	20,219
United States	1,351,847
Other North America	.....
Total	1,421,371
South America:	
Argentina	20,486
Bolivia	110
Colombia	26,067
Ecuador	2,349
Peru	13,427
Venezuela	184,761
Total	247,200
Europe:	
Albania	1,659
Austria	718
Czechoslovakia	119
France	496
Germany (Old Reich)	4,544
Hungary	1,755
Italy	57
Poland	3,891
Rumania	43,231
U.S.S.R.	212,909
Other Europe	.....
Total	269,379

Country	1940
Asia:	
Bahrein Island	7,095
British India	2,250
Burma	7,979
Iran	78,592
Iraq	25,725
Japan	2,639
Netherland East Indies	60,830
Sakhalin	4,000
Sarawak and Brunei	7,047
Saudi Arabia	5,365
Total	201,522
Africa:	
Egypt	6,053
Other Africa	.....
Total	6,053
Australia	.....
Other undistributed	580
World total	2,146,105
Total outside U.S.	794,258

Authority: *World Petroleum*, preliminary figures.

Just as the geographical map was in transition, so was the oil map of the world in so far as control of oil sources by the axis on the one hand and the Allies on the other hand was concerned. A glance at Table I is enough to reveal the axis



TOTAL WORLD PRODUCTION OF PETROLEUM and output of the three principal producing countries, as compiled by *The Mineral Industry*

partners woefully behind the Allies, both as to actual control and as to sources open to them through military blockades. The statistical picture (Jan. 1, 1942) is about like that in Table II.

Table II.—*Oil Sources and 1940 Production*

Allies	Thousands of Barrels	Axis	Thousands of Barrels
Controlled by .	1,835,796	Controlled by .	63,109
Available to . .	247,200	Available to . .	none
Total	2,082,996	Total	63,109

In other words, statistically, Britain and the United States and their Allies, including Russia, controlled or had available to them at the close of 1941, 85% of all the oil produced, and directly controlled 30 times as much oil as the axis.

Actually, the indicated disparity, while great, was not that great. For example, Britain itself had no commercial oil production on the British Isles; therefore transportation—keeping the sea lanes open against axis blockade—was a factor. But essentially it was the great existing disparity that dictated military campaigns, blockades and counterblockades, with the axis partners trying to get more oil and the Allies trying to keep them from getting it.

In the case of Japan it was an outright war for oil, as well as for other raw materials. Normally consuming between 24,000,000 and 30,000,000 bbl. annually, and with a controlled production in Formosa and Sakhalin of less than 7,000,000 bbl., it had to supply its battle fleets and mechanized armies from war reserves it had been building up.

Previously Japan got 65% of its requirements from the United States and 25% from the Netherlands East Indies. The first U.S. embargo on shipments to Japan was put in effect Aug. 1940 applying only to shipments of high-grade motor fuel and aviation gasoline. Finally as Japan moved into French Indo-China, beginning its threatening advance southward, the embargo was made complete, covering crude oil and all petroleum products.

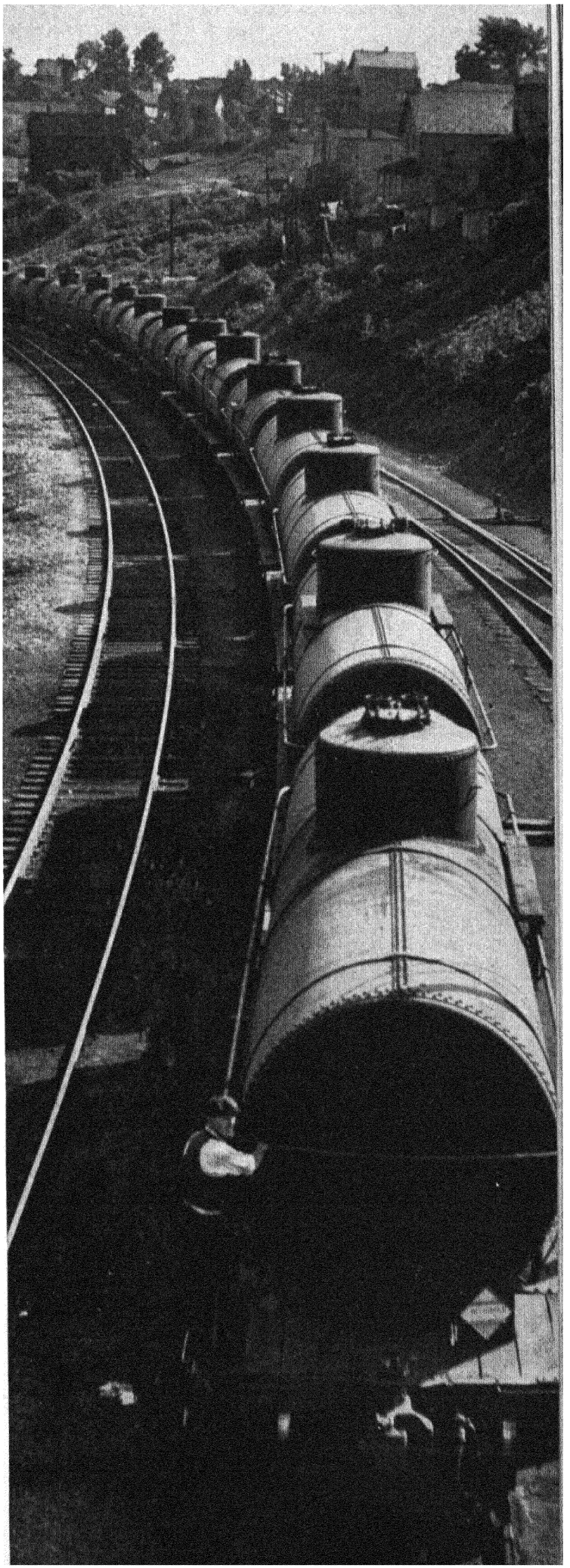
Japan had the choice to make, whether to ease its oil situation by relinquishing conquest or by making fresh conquest. It chose the latter, with its goal the rich oil fields of the Netherlands East Indies and of Sarawak and Brunei, together representing an annual production of more than 67,000,000 bbl.

Nazi occupation of Rumania gave Hitler full control of Rumania's annual production of 43,000,000 bbl. but, as this had previously been the chief axis source, together with Germany's large production of synthetic gasoline and oils from coal, it could not have made a considerable addition to the axis balance sheet of 1940–41.

The rich fields of Iraq and Iran beckoned. After the Greek campaign it appeared that they would be the goal of the next nazi thrust. Instead, the attack was against Russia, having as one of its most important objectives Russia's great oil fields in the Caucasus. Success in this would serve a triple purpose: First, to deprive Russia of much of its needed oil; second, to make it available to the axis, and third, to make even more attractive a thrust into Iran and Iraq.

Events must determine whether the nazi drive for oil was necessitous as an immediate need. There was no evidence to show that the German war machine was short of gas in 1941. However, it was safe to say that, as a need of the future in connection with a prolonged war, the drive was dictated by necessity from the standpoint both of bolstering reserves, which by this time must have been heavily drawn upon, and of depriving axis enemies of strategic oil sources.

As it was, the Iraq oil supply was cut from Britain temporarily



RAILROADS began mass transport of petroleum to the eastern U.S. seaboard July 8, 1941 for the first time in 20 years, as diversion of Atlantic oil tankers to Great Britain threatened a momentary oil shortage

A PETROLEUM PIPE LINE from Portland, Me. to Montreal, Canada was rushed to completion in 1941, to eliminate the circuitous tanker route from Portland around Nova Scotia and through the St. Lawrence river

and Iran sources were menaced until the military occupation of those countries by Britain was accomplished in 1941. Moreover, the success of the nazi air and submarine blockade early in the year, during which a high toll of tankers was taken, presented Britain with a serious oil problem. To help meet this situation the United States government diverted American tankers to the number of 50 from the Atlantic coastal trade and turned them over to the British. Before the end of the year, the abatement of the nazi submarine campaign and the commissioning of new British tankers had so relieved the situation that 40 of the American tankers had been returned to their usual service.

Of all the warring countries, the United States was by far the best situated as to vital petroleum supplies. With a production within its borders amounting to more than 60% of total world production, and with proved underground oil reserves known to be recoverable, estimated at more than 19,000,000,000 bbl. as of Jan. 1, 1941, it appeared assured of an adequate petroleum supply for all war needs.

On the other hand, this does not mean that there were no problems to be met in supplying greatly increased military demands.

The United States, while producing more than twice as much oil as the rest of the world, uses three-fifths of the total world consumption of petroleum products. Its 132,000,000 people own two-thirds of all the world's motor vehicles, and much of American life has been built around automobile transportation—far more so than in any other country. Thus, cutting or rationing of gasoline and other petroleum supplies for civilian use, as had been done in all other belligerent and occupied countries, is a much more complicated thing to do in the United States. Nevertheless it was highly probable that this would come unless complete curtailment in automobile production and voluntary conservation of gasoline for civilian use made such measures unnecessary.

With the United States in the war, military petroleum requirements came first—the supplying of a rapidly building two-ocean navy, an expanding mechanized and motorized army and an air force of huge proportions. In addition, the United States might be called upon to supply Britain and other Allies with greatly increased amounts of gasoline, lubricants and fuel oil should Japan succeed in its oil conquests in the Netherlands East Indies and should anything happen to Iraq, Iran or any other Allied oil sources as the war progresses.

Also, it is one thing to possess or be in control of great oil sources and another thing to have the finished products in adequate supply exactly when and where they are needed. In other words, transportation is always a potential bottleneck.

This bottleneck was felt on the eastern seaboard of the United States when the 50 American tankers were diverted to British service. One of the first acts of Secretary of the Interior Harold L. Ickes, upon his appointment as petroleum co-ordinator for national defense early in June 1941, was to call for voluntary civilian curtailment of gasoline consumption and to initiate closing of filling stations at night and on Sundays in eastern U.S. The curfew was lifted in November when many of the tankers were returned to usual coastwise service.

To guard against a repetition of the threatened east coast oil transportation shortage legislation for defense pipe lines was passed and a new giant pipe line from Texas to the Atlantic coast was advocated by the petroleum co-ordinator and the petroleum industry. The line was killed by a ruling of SPAB denying the line steel priorities.

Meanwhile, the United States was well launched on the biggest tanker building program in its history—one which would make its tanker fleet the largest in the world. With 360 American tankers plying the seas and 204 additional tank vessels building, the total of 564 in service on completion would surpass Great Britain's fleet, estimated by the maritime commission to comprise 432 vessels.

Gasoline.—American refinery capacity and output exceeded in 1941 all records of the past. During 1941 crude oil run through stills increased from 3,500,000 bbl. to 4,100,000 a day, greater by 17%. Since 1933 the increase in product output by American refineries was more than 50%. Thus in supplying war demand for gasoline and other products there was no refinery bottleneck in so far as quantity output and capacity were concerned.

But the war called for more new products, notably for 100-octane aviation gasoline and specially processed lubricants for aeroplane engines and the munitions plants. In 1938 100-octane gasoline came only out of laboratories. The commercial development of this high-grade fuel went hand in hand with the army's and navy's development of bombers and other aircraft and with the aeroplane expansion plan under the national defense program. Thus the fuel was a vital part, not alone of the U.S. air arm in war but of that of Britain, Russia and China to whom American planes were being and would be provided increasingly.

A nation-wide survey made by the petroleum co-ordinator as of mid-October, showed a manufacturing capacity of 100-octane gasoline amounting to 43,000 bbl. a day. Plants nearing completion were to add 2,500 bbl. daily by Jan. 1, 1942.

Inasmuch as it was estimated that a daily output of more than 120,000 bbl. would be necessary by 1943, a broad government-industry program was launched to triple output in from 10 to 12 months. The program contemplated an increase in the capacity of existing plants by providing additional charging stock, providing for minor processing changes, and diverting to 100-octane manufacture certain complicated processes used to make lower-octane fuel. It also called for construction of new plants, 25 of which

were building. All these plants were being given high priority rating.

It seemed that the American motorist might find a decline in the octane rating of motor fuel available to him, partly because of heavier demands of the military for high quality gasoline and partly because of the rationing of tetraethyl lead to refiners and marketers due to curtailment of pig lead for this purpose by OPM. In many cases this would mean carburettor and other adjustments. It would have the over-all effect of increasing unit consumption of gasoline.

This was but one of the many evidences that America at war meant a major adjustment for the motorist. Generally speaking, the picture appeared to be this: New cars greatly limited—or none at all—because of material priorities; new tires greatly limited because of material priorities; existing cars more expensive to run; the ever-present possibility of fuel rationing due largely to potential transportation bottlenecks; and the ever-present possibility of restrictions against pleasure driving. It was noteworthy that actual shortage of oil, and therefore of gasoline, was not the primary factor. Indeed, probably no industry was in better position to supply normal civilian needs than the petroleum industry.

In addition to meeting demands for regular products, the petroleum industry planned to furnish as much as 60,000,000 gal. annually of military toluene, the chief source of which has been coal tar, a by-product of coal.

Organization of Industry for War.—Organization of the petroleum industry for war effort in co-operation with the petroleum co-ordinator was effected by the formation of the Petroleum Industry Council for National Defense.

There was no question in 1941 but that the American petroleum industry faced a challenge far more serious and far more difficult in solution than the one it faced in World War I, although basically, it was in a better position because of tremendous oil reserves and of new discovery, production and refining techniques and of greatly augmented facilities.

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Philadelphia. Third largest city of the U.S.A., Philadelphia had a population of 1,931,334 by the federal census of 1940. Mayor (Jan. 1, 1942), Bernard Samuel.

Mayor Robert E. Lamberton died suddenly on Aug. 22, 1941, and Bernard Samuel, president of the city council, succeeded him as acting mayor in accordance with provisions in the city charter. The political leaders immediately planned to nominate a man to be elected in November to serve out the unexpired term. It was soon discovered that the revised election law made no provision for nomination in the emergency. When the local courts were asked to interpret the law they decided that a nomination could be made, but the state supreme court overruled the decision and held that there was no legal way for making a nomination.

The election commission, acting in obedience to a law forbidding the participation in elections of parties whose members favoured the overthrow of government by force, ruled that the name of no communist candidate could appear on the ballots to be used in the November election. The voters were called upon to elect, among others, five judges of the common pleas court, a judge of the orphans' court and a controller, treasurer, registrar of wills and a coroner. The sitting judges, supported by the Republicans, were all re-elected. The Democrats had held the four other offices for eight years and sought to retain them but the Republicans elected all but their candidate for controller.

The appropriations for the support of the local government exclusive of the schools amounted to $81,418,943.17 for the year with estimated receipts of approximately the same amount. The board of public education, an independent taxing authority, appropriated $31,510,743 for the support of the schools and for debt charges in which was included $2,700,000 contributed by the state. The total cost of the local government was $112,928,686.77, of which $110,229,686.77 had to be raised by taxation.

Long-continued drought in the autumn lowered the rivers from which the city draws its water and revived the agitation for tapping new sources of supply and for completing the long-delayed sewage disposal plants. Of the total of $1,320,000,000 in primary contracts for national defense awarded to Pennsylvania manufacturers, $685,720,000 was awarded to manufacturers in the city. (G. W. Do.)

Philately. The year 1941 saw a further reduction in stamp issues, despite the upheavals in governments which in times of peace presage heavy emissions of postage and commemorative stamps. The heavy hand of war reduced the desire to print unnecessary stamps, except that the axis and axis-dominated nations kept up their usual prolixity, especially in semipostal issues—those stamps partly for postal use and partly for charities.

The Standard catalogue listed 1,335 new stamps of all categories issued during the year, with several occupational issues not included, as they were merely tentatively listed. Of these, 829 were purely postal-purpose stamps, 215 for air mail, 181 semipostal and the balance for official, special delivery, tax, parcel post and the like.

The largest number of issues was credited to the U.S.S.R., all of these before the government became involved in active warfare. Issues from Germany totalled 27, 19 of them semipostals. From Great Britain there were none, and from the whole commonwealth only a few surcharges from colonies whose supplies of the most used values had been depleted.

The War.—Typical of what happened to many collections in the war zones was the cable: "Philately house is no more. No salvage." This meant that F. Hugh Vallancey's library of over 10,000 philatelic volumes was destroyed, together with a magnificent 70-volume collection of the stamps of Great Britain and Ireland. Many collections were removed to places of safety; many dealers even sent stocks to the United States, but private collections suffered.

War issues were not many. The De Gaulle stronghold in French Equatorial Africa surcharged the stamps of that colony with the word "Libre," signifying the Free French dominion. In place of the Netherlands stamps bearing the portrait of Queen Wilhelmina, in exile, the German occupants surcharged stocks of the low value (three-cent) stamp bearing a simple design and figure with new values for all postal purposes. In Norway the King Haakon portraits were replaced with a coat-of-arms design.

Commemoratives.—The United States issued only one commemorative stamp during 1941, this marking a new low for the past decade. It marked the sesquicentenary of Vermont's admission to statehood. The U.S.S.R. issued 67, in various groups, most of them commemorating individuals or events practically unknown outside of the soviet union. Brazil commemorated the bicentennial of the founding of Porto Alegre, historical events and the fifth general census of the country. Cuba celebrated the 100th anniversary of its first medical journal.

The wide range of matters commemorated in postal paper shows the increased use being made of philately to spread knowledge of local matters to the world at large. Political propaganda—such as the German and Italian issues bearing portraits of their respective dictators and France's portrait of Pétain—was losing

favour to such matters as national heroes in fields of science, art, poetry and literature and music, to say nothing of national history heretofore unknown outside of the national borders, except to students and savants.

Literature.—Restrictions of wartime made the usual French contributions to the field nonexistent during 1941. British literature was also restricted, mainly because of wartime activities of students, but the usual catalogues from British sources were forthcoming, though the limitations on paper held down the number of copies available.

In the United States, despite a paucity of general books, the American Philatelic society's handbook no. 8, *The Bank Note Issues of the United States, 1870–1893,* by Lester G. Brookman, collated a great amount of material on those issues which had been discovered since 1903, when Luff wrote his memorable handbook.

Savings Stamps.—Every post office in the United States was in 1941 selling "defense saving stamps," of 10-cent, 25-cent, 50-cent and $1 denominations. As with the "thrift stamps" of 1917–18, and the various issues of postal savings stamps, these were not listed in the standard catalogues, but experience since 1917 showed that collectors in the United States found places for them in collections. Why these stamps, which have admittedly no postal value, should be debarred from catalogues while "hunting stamps," which have the same lack of postal connection (except the common point that these, like the savings stamps, are obtainable at the post office) are included, was again in 1941 one of the mysteries of cataloguing. (M. HA.)

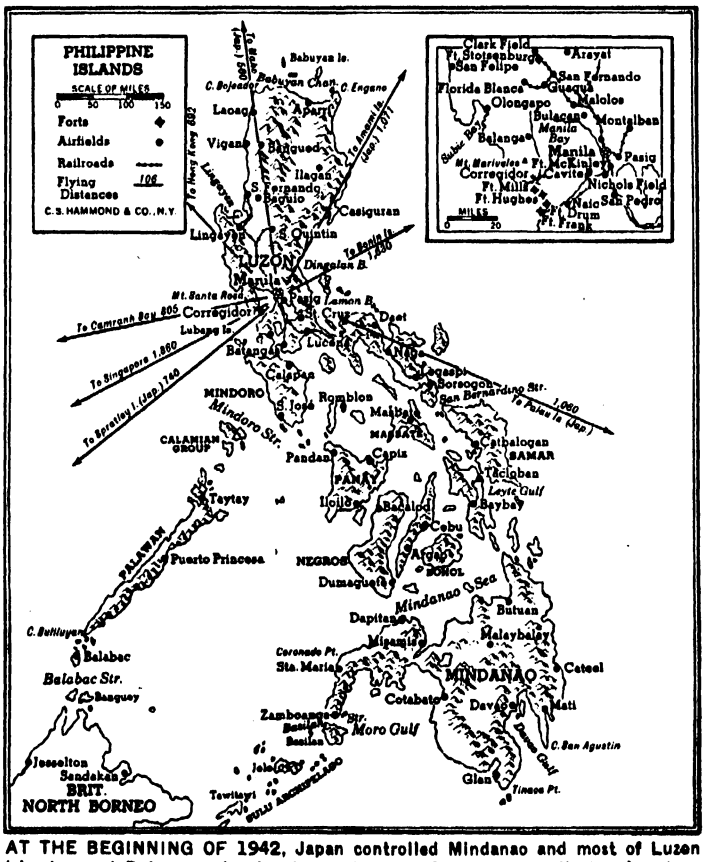
Philippines, Commonwealth of the.

The Philippine Islands lie almost directly east of French Indo-China. By the usually travelled steamship routes, Manila is 631 nautical miles southeast of Hongkong, 907 mi. northeast of Saigon, 1,370 mi. northeast of Singapore, 1,564 mi. north of Soerabaja, 3,855 mi. northwest of Sydney, 61 mi. south of Formosa, 1,757 mi. southwest of Yokohama, 4,838 mi. west of Honolulu, and 6,929 mi. southwest of San Francisco. The archipelago extends north and south for 1,152 mi. between north latitudes 4°21′ and 21°10′, and includes 7,100 islands with a total area of 115,600 sq.mi. Estimated population at the end of 1941, 17,000,000. Principal foreign nationalities in 1939: Chinese, 117,487; Japanese, 29,057; Americans, 8,709; Spanish, 4,627; Germans, 1,149; British, 1,053. Principal religions: Roman Catholics, 12,603,365; Aglipayans, 1,573,608; Mohammedans, 677,903; pagans 626,008; Protestants, 378,361. Capital, Manila (623,492). Other chief cities, Cebu (146,817), Zamboanga (131,455), Davao (95,546).

Basic laws are the Philippine Independence act (Public Law No. 127, 75th congress), 1935, as amended, 1939; and the Philippine constitution, adopted in accordance therewith, 1935, as amended, 1939 and 1940. The president and vice-president are elected at large; there is a bicameral congress with senators elected at large and representatives elected by districts. Status, a commonwealth under the sovereignty of the United States until July 4, 1946, when independence is provided for by the Philippine Independence act. U.S. high commissioner, Francis B. Sayre; Pres. Manuel L. Quezon; Vice-Pres. Sergio Osmeña.

History.—*Japanese Invasion.*—As part of the attack launched Dec. 7, 1941, upon the Pacific possessions of the United States, the British Commonwealth of Nations, the Netherlands and upon Thailand, the Philippines were invaded by Japan. The invaders were met and resisted by forces commanded by General Douglas MacArthur (*q.v.*), commanding general of the United States armed forces in the far east, composed of the U.S. troops in the Philippines augmented by troops of the Philippine army called into the service of the United States in accordance with the terms of the Philippine Independence law and the Philippine constitution and by the U.S. Asiatic fleet. For a considerable period before 1941 the United States had maintained approximately 10,000 troops in the Philippines, of which more than half were Philippine scouts, composed of Filipino enlisted men and U.S. and Filipino officers. Fort Mills, on the island of Corregidor at the entrance to Manila bay and its appurtenant forts was one of the world's strongest fortresses. A small Asiatic squadron was based upon a well-equipped naval station at Cavite, on the south shore of Manila bay, with additional facilities at Olongapo, some 30 mi. to the north on the Bataan peninsula. In 1936 the Philippine commonwealth began to build up its own system of national defense. Major General Douglas MacArthur, retiring chief of staff, United States army, assisted by a U.S. military mission, was made military adviser to President Quezon and energetically supervised the execution of the national defense act, the first law passed by the national assembly of the commonwealth. Under this law, some 30,000 recruits were trained each year, with the expectation of providing a reserve of 300,000 trained men when independence was achieved in 1946. The defense program also called for the development of a fleet of about 30 65-ft. fast motor torpedo boats and a small air force composed chiefly of bombers. By the spring of 1941 the reserve consisted of about 132,000 men, two motor torpedo boats were in commission, and the Philippine air corps had acquired from 40 to 60 planes, most of them training ships. The regular Philippine army consisted of about 450 officers and 3,600 enlisted men. Military expenditures under the commonwealth averaged about 16,000,000 pesos per year from 1936 to 1940, inclusive.

In Jan. 1941, active steps to strengthen the defenses of the Philippines were taken by both the United States and the commonwealth governments. President Quezon, speaking of the American national defense program, declared that as long as the Philippines remained under the U.S. flag the defense of the country remained "primarily the responsibility of the United States."



AT THE BEGINNING OF 1942, Japan controlled Mindanao and most of Luzon island except Bataan peninsula (insert, between Subic and Manila bays), where Gen. Douglas MacArthur concentrated the U.S.-Filipino forces

At the same time, he stated that "the Filipino people, desirous of co-operating with the United States in the execution of this defense program, are ready to bear their full share of that responsibility. To this end I have assured the government of the United States, on behalf of the commonwealth, that the entire Philippines—its man power and material resources—are at the disposal of the United States in the present emergency." In Jan. 1941, 5,500 Filipino reservists were taken into the Philippine scouts for one year of training. General MacArthur was subsequently placed in command of all the United States armed forces in the far east. Reinforcements of men, munitions and warplanes were rushed to the Philippines, and large sums were spent on strengthening the defense works of the islands. The Asiatic squadron was reconstituted as the Asiatic fleet. On July 26, 1941, the mobilization of the Philippine army and its incorporation into the forces under General MacArthur's command was begun, and by Dec. 7 a considerable proportion of the reservists were in active service.

The main Japanese attack upon the Philippines was made upon the island of Luzon. With powerful naval and air protection troops were landed on the north, west, south and southeast coasts. Within a comparatively short time their overwhelming numerical superiority enabled the Japanese to secure domination of the air and to force the stubbornly resisting U.S.-Philippine forces toward Manila from both the north and south. On Jan. 2, 1942, Manila, which had been declared an open city and had been evacuated by all military forces and the civil government, was occupied by the Japanese. The naval station at Cavite had been rendered useless by bombing and was abandoned. MacArthur's southern forces, however, slipped around Laguna de Bay and joined the main U.S.-Philippine forces on a line north of Manila and extending from the Pampanga swamps into the Bataan peninsula. With enormous superiority in the air and vastly greater ground forces, the Japanese gradually forced MacArthur's army south along the peninsula toward Corregidor which, some two miles from the mainland, guarded the U.S.-Philippine rear and denied the use of Manila harbour to the Japanese. The resourcefulness and tenacity with which the outnumbered Americans and Filipinos, early in 1942, threw back repeated attacks made by the veteran Japanese troops without regard for loss of life thrilled the whole world. By holding very large Japanese forces in the Philippines, MacArthur's army made a valuable contribution to the effort of the United Nations to delay the Japanese onrush into southeastern Asia and the island world stretching from Borneo and Sumatra to Australia until reinforcements could arrive.

After Manila had been declared an open city and evacuated by its defenders, the Japanese subjected it to repeated bombings in which churches, schools and residential sections as well as docks and other installations of military significance were destroyed. In many parts of the archipelago undefended cities, towns and villages of no military value were ruthlessly bombed and machine-gunned from the air. Sternly repressive measures were taken in dealing with the civilian population.

Up to Feb. 1, 1942, no definite information had been released in the United States as to the proportion of the Philippines which had been occupied by the enemy. Most of Luzon undoubtedly was in Japanese hands. Davao was known to have been seized early in the war. The situation in the remainder of Mindanao and the Visayan, or central, islands was in doubt. Jorgé Vargas, formerly executive secretary to President Quezon, with cabinet rank, was appointed by the Japanese commander as mayor of Manila. Later, the Japanese announced the formation of a "cabinet" of prominent Philippine political figures, headed by Vargas as chief administrator. President Quezon and High Commissioner Sayre were reported to be with the American-Philippine army. The former publicly declared that the Philippine people would remain loyal to the United States in defiance of Japanese force and intrigue. President Roosevelt in a message to the Philippine people issued Dec. 28, 1941, declared: "their freedom will be redeemed and their independence established and protected." (*See* also JAPAN.)

Political Developments.—The outstanding political event of 1941 was the election, held in November, for the choice of the president, vice-president, 24 senators (at large) and 98 representatives (by districts). Although numerous small opposition parties took the field, President Quezon, Vice-President Osmeña, all the Nacionalista candidates for the senate and all but three of those for the house of representatives won by large majorities. Complete returns from 35 of the 49 provinces gave President Quezon 1,273,864 votes against 273,735 for his nearest opponent, ex-Senator Juan Sumulong; Vice-President Osmeña polled 1,350,838 votes against 114,244 for his nearest rival, Emilio Javier. There were no fundamental political issues, all parties advocating independence on or before July 4, 1946. Senators serve for six years, representatives for four years. The newly elected officials were sworn in, but the Japanese invasion made it impossible for them to perform their normal functions. Under the terms of the 1940 amendment to the Philippine constitution, President Quezon would serve until Dec. 31, 1943, when he would automatically be succeeded by Vice-President Osmeña for the remainder of his four-year term.

Education.—Public schools, March 1940: number of schools, 12,057; enrolment, primary, 1,572,639; intermediate, 277,574; secondary, 90,579; collegiate (normal and technical), 3,777; total, 1,944,569. Private schools, June 30, 1940: number of schools, 439; enrolment, kindergarten, 2,844; primary, 41,861; intermediate, 22,578; secondary, 51,055; collegiate, 31,153; total, 149,491; in addition, recognized schools (136) offering special vocational courses, 9,188 enrolment.

Finance.—The monetary unit is the peso; value, 50 U.S. cents; exchange rate at par during 1941. Estimated general fund revenues, 1941, 91,200,000 pesos; estimated expenditures, 91,000,000 pesos. Total bonded indebtedness, Dec. 31, 1940, 148,757,000 pesos; total sinking fund reserve, 75,978,159.45 pesos. Treasury notes in circulation or available for circulation, Dec. 31, 1940, 163,143,955 pesos. Gold reserve: cash surplus, exchange standard fund, 51,631,446.35 pesos; cash balance, treasury certificate fund, 163,143,955 pesos. Bank notes in circulation and available for circulation: Bank of the Philippine Islands, 1,758,385 pesos; Philippine National bank, 2,599,853.47 pesos; reserve with treasurer of the Philippines, 1,125,325 pesos.

Trade and Communication.—*Trade.*—During 1941, Philippine foreign markets, except in the United States, were virtually closed on account of World War II. During October nearly 95% of Philippine exports were to the United States. In 1940, total imports were 269,720,000 pesos; exports, 231,826,000 pesos. Chief exports (per cent of total exports by value): sugar, 40; coco-nut products, 20; abacá, 11.2; embroideries, 4; tobacco products, 4. Chief imports (per cent of total imports by value): iron and steel and their manufactures, 16; cotton goods, 13; petroleum and products, 9.2; tobacco products, 5.3; paper and manufactures, 4.9; meat and dairy products, 4.4; wheat flour, 3.6; motor cars and parts, 3.4; chemicals, 3.1; electric machinery, etc., 2.9.

Communication (1940).—Railroads, 840 mi. Highways (kilometres) first-class, 11,771.9; second-class, 7,393; third-class, 3,795.1; trails, 4,912.1. Motor vehicles registered: automobiles, 33,898; trucks, 20,236; motorcycles 630. Airways: 1,171,453 passenger miles; 20,407 passengers; 3,083,415 lb. air express; 15,855 lb. air mail. Telephones 31,419. Telegraph lines, 14,716,930 kms. Broadcasting stations, 6.

Agriculture (1938).—Total estimated value, 417,144,000 pesos. Area planted and value, leading crops: palay (rough rice) 1,912,000 hectares, 136,423,000 pesos; sugar cane, 228,000 hectares, 113,559,000 pesos; coconut, 643,000 hectares, 92,126,000 pesos; abacá, 508,000 hectares, 22,672,000 pesos; corn, 703,000 hectares, 19,424,000 pesos; banana, 92,000 hectares, 10,312,000 pesos; tobacco, 75,000 hectares, 4,125,000 pesos. Livestock and poultry (1939) were valued at 141,514,451 pesos. Census and value: carabaos, 2,918,730, 78,826,516 pesos; hogs, 4,348,515, 26,100,326 pesos; cattle, 1,349,264, 20,077,610 pesos; chickens, 25,365,102, 8,994,591 pesos; horses, 340,433, 6,222,661 pesos; goats, 402,173, 874,155 pesos; ducks, 690,868, 418,592 pesos.

Manufacturing.—Chief manufactures are centrifugal sugar, copra, coconut oil, dessicated coco-nut, cordage, cigars and cigarettes and embroideries. Production of sawmills in 1940 was 332,908,721 bd.ft.; number of mills, 148.

Mineral Production (1940).—Total estimated value, 91,626,384 pesos. Chief products: gold, 1,096,745 fine oz., 76,563,888 pesos; iron, 1,221,126 long tons, 5,633,728 pesos; copper 20,014,918 lb., 3,487,701 pesos; chromite, 189,919 long tons, 2,661,764 pesos; silver, 1,394,736 fine oz., 1,874,094 pesos; manganese, 48,036 long tons, 1,287,011 pesos; lead, 2,080,381 lb., 117,927 pesos; platinum, 6.03 troy oz., 271 pesos. (J. R. H.)

Phillips, Sir Tom Spencer Vaughan (1888?–1941), British naval of-

ficer, entered the navy in 1903 and served in World War I as an acting captain. He was promoted to captain in 1927, chief of staff and flag captain to the commander in chief of the East Indies, 1932–35, and director of plans for the admiralty, 1935–38. From 1938 to 1939 he commanded the home fleet destroyer flotillas and was later named rear admiral and vice-chief of the naval staff at the admiralty. Phillips became head of Britain's far east battle fleet on Dec. 1, 1941. On the following day the far east fleet headed by the battleship "Prince of Wales," flagship of the fleet, and the "Repulse," battle cruiser, steamed into Singapore. A week later the two British warships were attacked by Japanese planes and both were sunk on Dec. 10. Admiral Phillips, one of the last to leave his post, was reported as lost.

Philoff, Bogdan Dimitrov (1883–), Bulgarian statesman, was born Apr. 10 in Stara Zagora, Bulgaria. He studied in the universities of Leipzig, Freiburg and Bonn in Germany, specializing in archaeology. In 1906 he was made conservator of the national museum in Sofia and in 1910 its director. For a number of years he taught archaeology and the history of art in the University of Sofia. In 1938 he became minister of public education and in 1940 premier of Bulgaria. During these latter years he developed strong pro-nazi leanings and on Mar. 1, 1941, he signed the Rome-Berlin-Tokyo pact, thus aligning his country with the axis. This move alarmed the Bulgar populace, which had begun to rely on its pan-Slavic ties with the U.S.S.R. for protection; the following day Philoff hastened to assure the parliament that the German mission in Bulgaria was there solely to "preserve peace" in the Balkans. (*See* also BULGARIA.)

Philosophy. With Russia in World War II the philosophies of both sides of the conflict, so far as they were consistent and articulate verbal systems, became rather more confused or were silent altogether in 1941. In terms of action and emotion, however, they became, if anything, more consolidated. What might be called the supremacy of the word, those once-stable systems of negotiable symbols running all the way from philosophic and religious rationalizations, international promises and obligations to financial patterns of exchange and money, received a severe shock in recent years.

Karl Mannheim's *Man and Society in an Age of Reconstruction* shows this characteristic lesion in modern philosophic thought and the scar tissue that comes with healing. Mannheim, who is the foremost student of the sociology of knowledge, attempts to reconcile what he considers the German and the English way of thinking. When living in Germany he had said that the "democratic system has already run its course." Now, living in England, he describes his effort "to free himself from his deep-rooted scepticism as to the vitality of democracy in our age." The man who wrote *Ideology and Utopia* 13 years ago was in 1941 making contact with democratic culture that revolutionizes his thinking. Although he still ignores America and the Scandinavian countries, he finds in English culture enough to make him hopeful of democratic survival and efficiency. Forces within western society that are working against the democratic process are, he says, concentrated control of materials and machines, the cult of experts which restricts significant social knowledge to the few, the centralization of administration in rigid bureaus, the professionalism of military affairs. It becomes indeed a conflict between what is called intelligence or substantial rationality and partial or functional rationality.

R. G. Collingwood's *An Essay on Metaphysics* treats the ultimate sanctum of formal philosophy as an historical science belonging to a time and a place and to a thinker with local predispositions. Metaphysics, he says, is a science of absolute presuppositions and must be treated never as an answer to questions but as a set of assumptions preceding them. Modern tendencies are not metaphysical. They are indeed antimetaphysical in three ways: first, progressive; second, reactionary; third, irrational. The first of these criticisms of metaphysics has the most validity. The second assumes many propositions to be absolute that modern thinking treats as relative. The third would devaluate systematic thinking and substitute emotion and other nonrationalistic processes. To this latter group, says Collingwood, belong the logical positivists. His conclusions are that the presuppositions of Christianity, and particularly of the Catholic church, are essential in western science and society.

Sir Charles Sherrington's *Man and His Nature* and John Laird's *Theism and Cosmology* are re-examinations of the old problem arising in the dualism inherent in Christian ideology. The conclusions in both cases are generally negative or at most much qualified assertions of uncertainty. Sherrington's book is a reply to the "fairy tale" that mind is separable from the rest of us. It is biological in background. Dualism is a problem, he says, because the individual is nevertheless one, "with a totalitarian behaviour doing just one main act at a time." Laird's book asks "whether and what we can learn about God in the natural way." The answer is, very little.

Reinhold Niebuhr's Gifford lectures are an effort to write a metaphysics for his social and ethical philosophy. Alfred J. Ayer's *The Foundations of Empirical Knowledge*, Andrew Paul Ushenko's *The Problems of Logic*, C. J. Ducasse's *Philosophy as a Science*, S. Dasgupta's *A History of Indian Philosophy*, Vol. iii, the symposium, *Science, Philosophy and Religion*, a conference on these subjects in their relation to a democratic way of life, and *The Bertrand Russell Case*, edited by John Dewey and Horace M. Kallen all have, in their respective ways, important bearing on recent philosophy.

In the field of what may be called occasional philosophy are four books on Nietzsche marking the revival of interest in that most occasional of philosophers. They are Crane Brinton's *Nietzsche*, Kurt Kassler's *Nietzsche und das Recht*, Alfred von Martin's *Nietzsche und Burckhardt* and George Allen Morgan Jr.'s *What Nietzsche Means*. But what Nietzsche really does mean will be hammered out one way or another, no doubt, with steel on battlefields. (B. B.)

Phoenix Islands: *see* PACIFIC ISLANDS, BRITISH.

Phosphates. World production of phosphates, chiefly phosphate rock, declined slightly in 1939 from the high of 12,123,000 metric tons, and in 1940 dropped heavily to an estimated 8,500,000 tons. Of this total both the United States and Ocean and Nauru islands contributed somewhat more than formerly, but the other leading producers, especially Tunisia and French Morocco, mostly showed declines of considerable magnitude. Exports from the northern Africa area, including Tunisia, Morocco, Algeria and Egypt, which were 33% of the world output in 1938 and 37% in 1939, dropped to 24% in 1940, while the United States output increased from 31% of the total in 1938 to 32% in 1939 and 48% in 1940. The 1940 imports into Europe, estimated at 2,798,000 tons, were 48% under the 1938 figure; on the other hand, total imports into other countries, at 2,469,500 tons, were somewhat greater than in 1938, but less than in 1939 by a small margin.

Mine output in the United States was 4,068,077 long tons in 1940, deliveries 4,002,700 tons and consumption 3,254,158 tons, all moderate increases over the preceding years. U.S. exports, which for several years had ranged well over 1,000,000 tons a year, dropped to 751,495 tons in 1940, but without adversely affecting production, the surplus being absorbed by the domestic consumption, which was 16% ahead of 1939 and 25% ahead of 1938. (G. A. Ro.)

Photography. **General Photography.**—The year 1941 was one of great photographic activity. World War II did not seriously restrict the supply of materials, although the manufacture of apparatus was to some extent affected by limitations on the use of metals and the diversion of skilled mechanics and optical workers to defense fields. Importation of foreign-made equipment naturally diminished, but American manufacturers produced cameras and lenses unsurpassed in quality. A new type of glass of high refractive index and low dispersion made by the Eastman Kodak company, and containing no silica, was used for making lenses for aerial cameras, and permitted a greater degree of correction than was previously attainable. In addition, surface treatment of glass components of lenses to reduce internal reflections was becoming common practice among lens manufacturers. Among the new cameras brought out during the year 1941 must be mentioned the Ektra, using 35-mm. film, interchangeable magazine backs, combined rapid film advance and shutter setting, focal plane shutter and coupled range finder; the Medalist, using roll film to take 2¼ x 3¼-in. pictures and possessing many of the features previously associated only with miniature cameras; new model Graflex and Graphic cameras; and the return of the Bantam Special. In addition there were new shutters, new range finders, new flash synchronizers and many other devices.

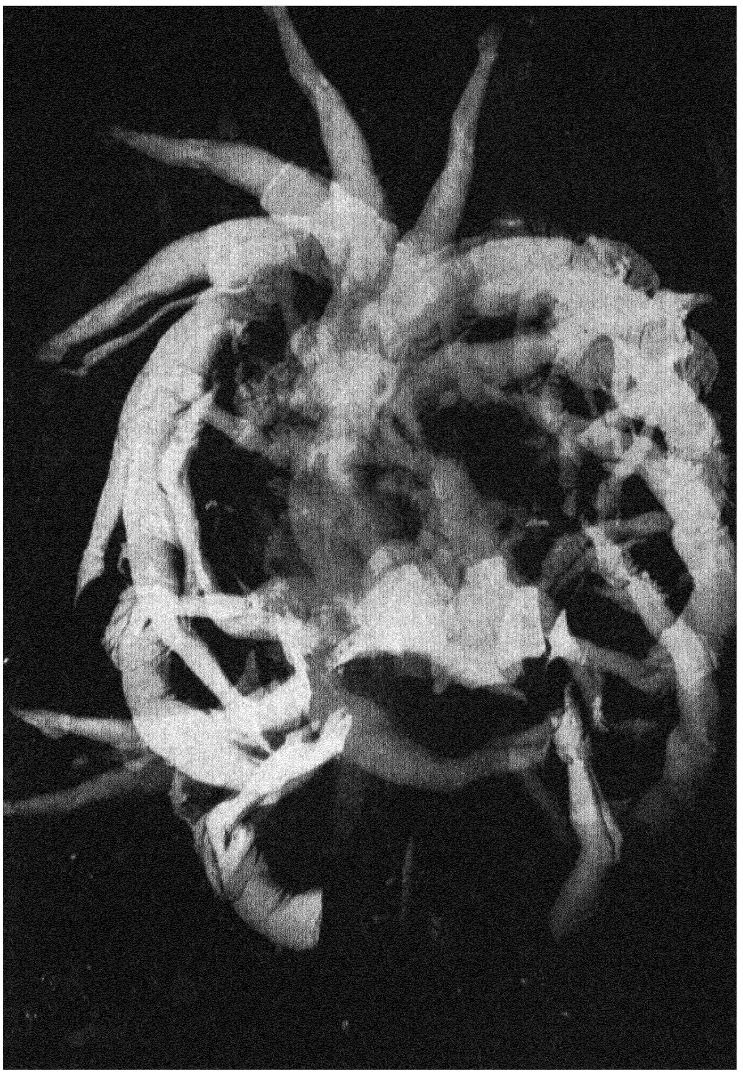
Flash Photography.—There was a steady growth of the use of flash lamps and synchronizers for all types of cameras. Flash lamps appeared in a variety of new forms. There was a tendency for the displacement of foil types of lamp by the wire and shredded foil forms, and an increase in the number of midget-size lamps. The SM lamp has a novel design, employing a combustible material massed on the lead-in wires and burned in an atmosphere of oxygen to give a peak of intensity in a very short time. Flash lamps were coated with lacquers transmitting very little visible light but passing the infrared freely so that photographs could be made on infrared film in the darkness of a black-out without bright flashes. First used in England, they were in 1941 made in the United States. Flash lamps were also coated with blue lacquers to give light matching daylight in quality so that they could be used for filling in shadows in colour photography out of doors. A portable variety of the Edgerton type of repeatable lamp was announced. It is intended for press use and gives over 5,000 flashes.

Films.—The craze for fine-grain developers fell off during the year 1941 as a result of the increasing use of films giving inherently finer grain. One interesting fine-grain developer introduced under the name Finex was claimed to give fine grain with a minimum of loss of speed provided the photographer exercised proper precautions. Wetting agents were introduced to prevent water spots in drying film, and they are also of some use for treating film before development to ensure uniform action. Concentrated rapid developing and fixing solutions were placed on the market, and a testing solution was made available by which the photographer could determine the extent of exhaustion of stop and fixing baths. Infrared drying lamps, introduced some time ago for rapidly drying such things as lacquers in the automobile industry were applied with some measure of success to the drying of films.

Colour Photography.—Kotavachrome and Minicolor were introduced as means by which amateur and commercial photographers could have colour prints made from Kodachrome transparencies. Until this time, colour prints could only be made by such methods as Wash-off Relief and Carbro, which involved making colour separation negatives and colour positives and bringing them into register on a final support. In Kotavachrome and Minicolor, the same types of coating are used as in Kodachrome, but coated on a white pigmented cellulose acetate support. The prints were made in the Kodak laboratories, the Kotavachrome from cut sheet Kodachrome and in sizes from 8x10 to 30x40 in., and the Minicolor from miniature size Kodachromes in sizes about 2¼x3¼ in.—known as 2X—and about 5⅜x7⅝ in. in size—known as 5X. There was a rapidly increasing interest in colour photography which was evident from the growth in the numbers of Kodachrome transparencies and 16-mm. and 8-mm. Kodachrome motion picture films. Survey of the popular magazines revealed the increase in the use of colour for advertising. One-exposure cameras were much used for the original negatives for this work, and printing by Wash-off Relief, Orthotone and Carbro were popular in the commercial field. Kodachrome in cut sheet form was also much used to provide originals from which photomechanical printing plates could be prepared, and the Crawford Flexichrome process was being successfully used for making advertising prints in colour from single black-and-white originals. A simplification of the Wash-off Relief process which was announced in 1941 consisted in using a solution of sodium thiocyanate instead of hot water for developing the relief.

On Dec. 17, 1941, Kodak announced still another important development in colour photography with the introduction of Kodacolor film and printing. The big feature of Kodacolor was that it could be used in most of the roll-film cameras. These sizes ranged from cameras making negatives 1⅝x2½ in. to 3¼x5½ in. in size. Kodacolor film was developed by the manufacturer into a negative colour film. This showed the complementary colours of the final colour positive print which was made on a paper base.

Military Photography.—Photography found a wide variety of applications in World War II. In tactics it was used largely from the air for mapping and intelligence. In the latter instance, which is the more important, it was used for photographing enemy troop concentrations, spotting targets for bombers, studying the effects of bombing and shellfire and studying camouflage. It was becoming regular practice to photograph the effects of bombing, by night as well as by day. In night photography from the air, flash bombs were used. They were timed to explode at desired distances below the plane and in such a position that the flash was just out of the field of view of the camera. Photoelectric devices, operated by the flash, were used to open or close the camera shutter. Much study was devoted to methods of developing negatives and making prints in a very few minutes. The development of camouflage was studied by making successive photographs on different days, and infrared photography was of particular importance because it usually permitted artificial pigments to be distinguished from natural colouring matters. Colour photography was also much studied, although it was not used in actual combat for lack of a film which could be readily processed in the field. Its chief use appeared to be in assisting the identification of objects, and in the study of one's own camouflage to obtain a record of its visual appearance to an enemy observer. Owing to the great heights at which aeroplanes must fly in order to avoid anti-aircraft fire and enemy pursuit planes, long-focus lenses were coming into use.



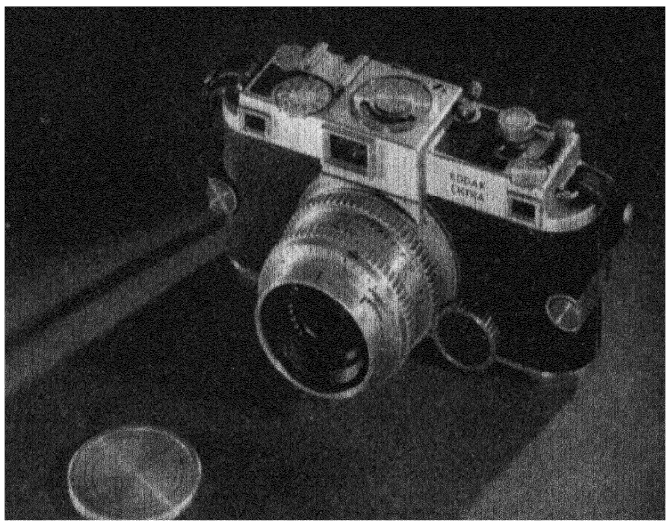
MULTIFLASH PHOTOGRAPH of two acrobats whirling their girl partner through space, taken by Harold E. Edgerton in 1941

The British made good use of Ciné camera guns, which used 16-mm. film. They were mounted in the wings of fighter planes to record the effect of machine-gun fire on enemy planes. The cameras were operated electrically when the firing buttons were pressed. Large numbers of motion and still pictures were made during operations to serve for instructional training and publicity purposes. In particular, the United States army had in preparation a large number of training films, produced with the co-operation of the motion picture industry.

An important development is the Airgraph system, which was launched during the year 1941 by the British post office in conjunction with Kodak Ltd. It is an application of the Recordak, and is used to facilitate transit of mail between England and the British forces in Africa and the near east. Letters are written on special sheets, photographed on 16-mm. film, sent to England by aeroplane on the rolls of film, and there printed on paper to a size of 4 in. by 5 in., and then handled as regular mail. Seventeen hundred letters can be photographed at a rate of 40 to 50 a minute on a single 100-ft. roll of film. About 85,000 Airgraph letters weigh only 20 lb., instead of an estimated 1½ tons if the letters were sent in the normal way.

Another important application of photography in national defense was in the aeroplane industry, where Eastman Matte Transfer film was used to sensitize metal sheets which were cut to serve as templates. The drawings were made on metal plates which had been coated with a white material which fluoresces under the influence of X-rays. These were printed by their fluorescent light onto metal sheets which had the sensitive layer of the Matte Transfer film stripped onto them. The sheets were developed to give negatives, or if a positive was required an intermediate negative was made on glass. The metal carrying the drawing was then cut to shape by a saw or mechanical shears, and served as a template accurate to 1/1,000 in. in a ft. The method resulted in very great savings of time and money in producing new aeroplanes.

Motion Picture Photography.—Although the production of motion pictures has tripled in the United States since 1920, there was a drop during 1941 owing to the loss of many foreign markets. The production of Technicolor pictures, however, showed an increase of some 25% over 1940, with a footage totalling some 100,000,000 ft. There was an increasing use of fine grain positive motion picture film for making release prints and for variable density sound recording. Many demonstrations were given of the stereophonic sound film system. In this system, several sound records are made on a film, and these are used to reproduce sound from several sets of loud speakers situated at the centre and sides of the stage. An illusion of sound perspective of high quality is realized. The production of 35-mm. Technicolor prints from 16-mm. Kodachrome originals was announced in September. The de-



THE KODAK EKTRA, a 35-mm. U.S. precision camera placed on the market in 1941, holds black and white or colour films interchangeably, has a compensating built-in view finder, a left-handed film advance lever and an antireflection f/2 50-mm. lens

velopment was expected to find application for industrial and documentary purposes as well as for theatrical shorts. A department of commerce survey of motion picture equipment in use in schools and colleges in the United States showed 12,443 projectors for 16-mm. film, 6,059 being fitted for sound; and 2,447 projectors for 35-mm. film. A group of five new Sound Kodascopes for 16-mm. sound film was put on the market, adaptable for home, school, institutional and industrial use. There was a steady increase in the use of substandard colour film in the form of Kodachrome, and a marked growth of interest in 8-mm. film and equipment for it.

There were also several finders and focusing devices marketed to enable the substandard cinematographer to approach the professional standard.

Applications.—Among the new applications were: improvements in X-ray film and equipment, especially for industrial purposes and the routine examination of conscripts; the contact screen process of rapid reproduction of photographs by high quality photolithography; photography of the ocean bottom by G. L. Clarke and M. W. Ewing at depths ranging from 125 to nearly 3,000 ft.; special methods of photographing documents charred by fire in air raids in England; and large-scale photography of documents on 16- and 35-mm. film in case the originals were likely to be destroyed by enemy activity.

One of the significant developments in photography for 1942 would appear to be the repairing and rehabilitation of cameras which had been left unused by the photographer or on the shelves of photo dealers. The Eastman Kodak company announced a special program for the repair of all cameras at a special 25% reduction in repair costs. This program started with the new year of 1942. As it was expected to be impossible to supply the tremendous demand for miniature cameras including all sizes from 35-mm. to 2¼x3¼, this special campaign for using older cameras would be timely.

New emphasis was being placed upon the use of present equipment. Photographers were encouraged to try out various printing processes and use their cameras in new photographic fields.

Blackout Bulbs.—A timely development in the latter part of 1941 was the introduction of the blackout or infrared flashbulbs. The Wabash Photolamp corporation developed the No. 2 blackout bulb first. Then followed the introduction of the No. 5R and 22R infrared-coated flashbulbs by General Electric and Westinghouse. When using these blackout flashbulbs with infrared film, it is possible to make photographs in darkness without showing the usual white flash. These infrared-coated bulbs can only be seen if one is looking directly at the bulb when a very slight reddish glow may be detected at the time of the flash. These flash lamps proved useful in places where the usual light from a flash might be disturbing.

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Physics. The phrase, properties of matter, so nearly defines the province of physics that it seems unnecessary now to retain the artificial distinction between these two topics. They are here treated together.

The present summary deals chiefly with American publications, simply because in Europe the calls of martial science depleted the laboratories of pure research. With the U.S.A. an active belligerent, more and more of her skilled investigators had to turn from research to practical development work or to the training of scientific aides and technicians.

The Nucleus.—Neutrons, deuterons and photons have been known for more than a year to cause fission of the heavy elements uranium and thorium. The list of effective bombarding agents has been extended to include protons and alpha particles. From the University of Rochester came a report by Dessauer and Hafner of experiments in which a beam of 6·9 mev protons from a cyclotron caused fission in thorium. The beam was allowed to fall on one face of a sheet of thorium whose thickness was too great for the protons to penetrate. Two reactions might be expected. First, the protons might cause fission of thorium directly, in which case the heavy recoiling fragments could be collected from the front, but not from the back of the thorium sheet. Second, the protons might create neutrons which could then cause fission of the thorium. In the latter case, however, since neutrons can pass very readily through heavy materials, fission would occur not only on one face, but almost anywhere in the thorium sheet, and, if the fission process here were a secondary one, recoiling fragments ought to emerge from the back of the thorium sheet as well as from the front. On putting this to the test, Dessauer and Hafner found that fission fragments could be collected only from the face of the thorium sheet upon which the protons fell; hence the fission of thorium by protons was established. The threshold energy was found to be 5·8 mev.

Alpha particles have only half as much charge for the same mass as protons, and therefore the energy needed by an alpha particle to cause fission would naturally be far higher than that required by a proton. Theoretical estimates suggested that at least 30 mev would be needed; this happens to be just within the range of the 60-inch cyclotron of the Crocker Radiation laboratory. Fermi and Segrè therefore bombarded a compound of uranium with 32 mev alpha particles from this instrument and reported the successful fission of uranium; but they were not able to quote any reliable figures for the effective cross section which would give an indication of the relative probability of the reaction.

It has been pointed out frequently that the fission of the uranium 235 isotope by slow neutrons releases millions of times as much energy as is derivable from the ordinary chemical reactions (such as the combustion of oil) upon which man relies for the motive power of engines, and that if only this atomic power could be made available in large controllable amounts, a new era of transportation would be at hand. Rumour had it that work fostered by this hope was progressing both in the old and the new worlds, but no reports appeared in the literature for a long time, nor, in view of the world situation, would it be reasonable to expect them soon.

The fission of uranium by neutrons of energy below 10 mev proceeds in an unsymmetrical manner. Among the fission fragments are found elements of atomic number 35 to 43, and 51 to 57. Apparently each uranium atom splits into two pieces, one appreciably heavier than the other. Recently, both in the U.S. and in Japan, the fission process has been carried out with much faster neutrons, up to 17 mev, and a progressive but slow change toward more symmetrical fission occurs. Many new products have been detected chemically, and by Jan. 1, 1942, the only element of atomic number 35 to 57 inclusive not reported among the fission fragments was tin (50).

Isotopes.—There appear to be many situations in which it is not justifiable to assume that the various isotopes of an element are present always in the same proportions. A striking instance occurs in the study which Murphy and Nier made with a mass spectrometer of the distribution of carbon isotopes, C^{12} and C^{13}, whose relative abundances are usually quoted as 98·9 and 1·1%. C^{12} is therefore very closely 90·0 times as abundant as C^{13}. Murphy and Nier find, however, that this ratio varies from 89·2 to 93·1 depending on the source of the carbon. Limestones, no matter what their ages, give low values; carbon from plants is

unusually rich in C^{12} and gives high values; while in carbon from meteorites intermediate values occur. No adequate reasons for these variations have yet been given.

Unstable or radioactive isotopes of carbon are not found in nature but can be manufactured in the laboratory. Their importance lies in their use as tracer atoms in biological work of all kinds. One of the most useful promises to be C^{14}, which decays to nitrogen by emitting beta particles of energy 0·145 mev. These beta particles are energetic enough to pass through living tissue a few tenths of a millimeter thick, so that the movement of carbon through a small plant, for example, can be followed without dissecting parts of the plant from time to time. Two reactions are available for making C^{14}, either $C^{13}(d,p)C^{14}$ or $N^{14}(n,p)C^{14}$. Ruben and Kamen found no appreciable decay in a sample over a period of nine months, and estimated the half life to be between 10^3 and 10^5 years. Since the rate of decay is so slow the biologist will be able to conduct unhurried experiments with C^{14} as a tracer, but if his results are to be reasonably accurate he must wait for stronger preparations than are available at the present time.

Cosmic Rays.—During the last 15 years many temporary theories have been advanced in connection with cosmic rays. Most have been dropped either because they explained only a very limited group of phenomena or because they were rendered untenable by new experimental discoveries. In 1941 the situation improved considerably and there existed a working theory of the general nature of the rays which promised to stand for some time. Parts of it had been suggested at earlier times, but until the year 1941 the necessary experimental support was lacking. The theory, given in bare outline below, rests on experimental evidence obtained by Swann and his colleagues, and by Jesse, Schein and Wollan, as well as on evidence of much earlier date.

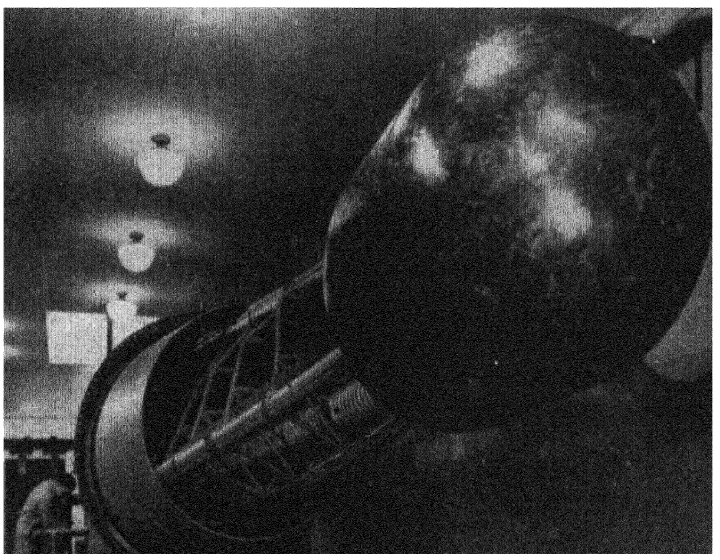
The primary radiation which comes to the earth from outer space is presumed now to consist of fast-moving protons. In the higher reaches of the atmosphere these protons create mesotrons by a process whose details are not known. Some of the mesotrons thus created move fast, others move slowly. Those which move slowly disintegrate before they have gone very far and thus give rise to electrons in the upper atmosphere, electrons which have more or less random directions of motion, since they come from slowly moving mesotrons. The fast-moving mesotrons travel far down through the atmosphere before disintegrating, and when they do so, the electrons to which they give rise will still possess, on the average, a marked downward component of velocity.

The key to this theory is the mesotron, a remarkably unstable particle, either positively or negatively charged, with a mass between 150 and 200 times that of the familiar negative electron. Within a few millionths of a second after its creation, it disintegrates into a neutrino and an electron. Since only the electron, but never the elusive neutrino, has been observed in such a disintegration, any indirect evidence bearing on the process is important. Two experiments may be quoted here. In the first, Rossi and Hall showed that the lifetime of a mesotron depends on its momentum, in agreement with theoretical predictions of the special theory of relativity. The faster a mesotron moves the longer it lives before disintegrating. Such an effect exerts an easily measurable influence on the absorption of various components of cosmic rays as they fly downwards through the atmosphere, and it is in such absorption measurements that the necessary experimental tests are found. In the second experiment, Rasetti set up an elaborate arrangement of cosmic ray counters, some measuring the absorption of mesotrons in aluminum or in iron, others detecting the delayed emission of particles which were presumably the disintegration electrons from the decaying mesotrons. Perhaps Rasetti's most significant observation was that the number of mesotrons absorbed by his apparatus was about twice the number of disintegration particles recorded. To explain this it is necessary to assume, with some theoretical justification, that positive and negative mesotrons are created in approximately equal numbers, but that they behave differently in passing through matter. Positive mesotrons are considered to undergo free decay in the manner just described, while the negative ones react with nuclei, raising them to excited states whose excess energy is subsequently removed by processes of β-decay.

The Betatron, otherwise known as the induction accelerator, was a new device developed by Kerst at the University of Illinois for the acceleration of electrons to very high energies. It does for electrons what the well publicized cyclotron does for much more massive positive ions, but operates on an entirely different principle. To understand the basic ideas, suppose that the magnetic field between the circular poles of a large electromagnet is changing. An electromotive force is set up in a loop of wire placed between the pole pieces. Indeed, the electric force is present whether the wire be there or not. If a vacuum chamber containing a source of electrons is placed between the poles, the electrons will be accelerated in roughly circular orbits by the electromotive force created by the changing magnetic field. The motion of the electrons is so fast that they could make millions of revolutions in a second. The scheme was not new, but Kerst was the first to make it work. The chief difficulty is to keep the circling electrons in a narrow beam, and this requires a magnetic field which is not, at any instant, uniform, but which varies radially in such a way as to keep the electron beam in a compact ring, whence it can, at the right instant, be diverted to a target. The design of the magnet and of its field controls the success or failure of the instrument. Already, in the second model of his machine, Kerst obtained electrons of 20,000,000 volts, capable of producing as much gamma radiation as 1,000 grams of radium. It was too early to estimate the full possibilities of the machine. Undoubtedly its applications to the field of medicine would be explored, and with it some cosmic ray phenomena might, later on, be duplicated in the laboratory. Such experiments would have an important bearing on questions of nuclear structure.

Low Temperature Phenomena.—Below the λ-point, at 2.19°K, liquid helium II possesses remarkable properties which set it apart from all other liquids. It has, for example, an extremely low viscosity, lower than that of hydrogen gas if measured by conventional methods; and it can transport heat at a prodigious rate. The reasons for this abnormal "conductivity" are not entirely clear since they depend on the theoretical concept of the liquid's structure. It is certain, however, that next to none of the heat transferred is carried by the classical process of conduction. According to two papers by Kapitza and by Landau (contributions from Russia, but published in the U.S.A.), a curious countercurrent is set up whenever a temperature gradient is maintained across a volume of He II, and the liquid behaves as though it were composed of two separate components. There is a current of normal He II which carries heat from the hot region to the colder one, and a countercurrent of "superfluid" liquid directed from the cold to the hot

TWENTY-TON ATOM SMASHER, capable of generating 8,000,000 volts, being assembled at Notre Dame university, South Bend, Ind., in 1941



part. In strong contrast to the ordinary process of convection, this counter-current carries no heat and has zero viscosity. Strange as this behaviour appears to be, it is nevertheless in agreement with earlier observations on the passage of He II through a porous plug and on the fountain effect.

Landau's explanation is that He II is a quantum liquid in which the transition from a state of potential motion to a state of vortex motion is impossible unless a finite discrete amount of energy is supplied. Only when the liquid is in the higher vortex state can energy be dissipated, and the motion of the superfluid is therefore thermodynamically reversible, since there is no entropy change associated with its transfer from place to place. The quantization is made mathematically in terms of longitudinal compressional waves, and, being macroscopic, must be entirely different from atomic or molecular quantization.

Miscellaneous Items.—Experts in the field of crystal structure have been wrangling amicably for more than a year about diffuse spots which appear on X-ray diffraction pictures when the incident radiation possesses noticeable monochromatic peaks. They are not Laue nor Bragg reflections, and their positions with respect to the Bragg spots change as the angle of incidence is varied. Two major points have been debated: (1) the origin of the diffuse spots and (2) their interpretation in terms of the structure of the crystal. Concerning the first point, Zachariasen of the University of Chicago and others have maintained that an elaboration of the classical theory of the effect of temperature on scattering furnishes an adequate explanation, but this view has been stoutly opposed by Raman and his school in India, who insisted that new quantum effects were involved. The latest work on the subject seems to show, however, that Zachariasen's theory should be acceptable to all investigators. The second point above has been examined with some care by Lonsdale in London, who reports that more precise experiments will have to be made and a more searching theory will have to be developed before much more than an approximate answer can be given.

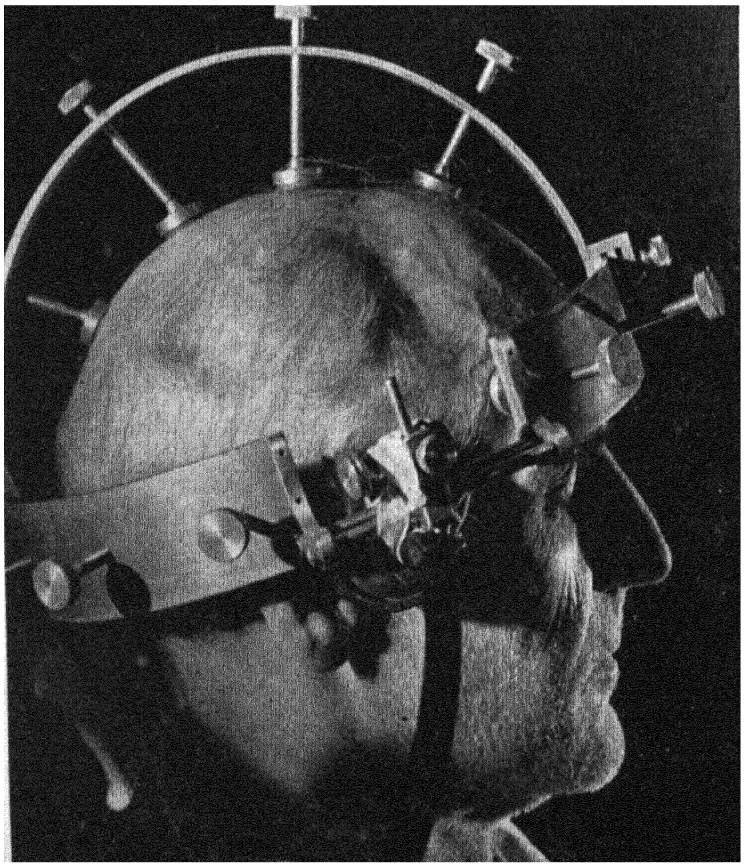
More reliable values of the magnetic moments of nuclei, and especially of the proton, have recently been reported by the method of radiofrequency spectra, originally devised at Columbia university by Rabi and his collaborators. Formerly, the accuracy was limited by the precision with which a magnetic field could be measured with a standard device like a flip-coil. In 1941 the necessary field measurements were made with much greater precision by means of the Zeeman effect.

Other advances during 1941 are found in studies of the electrical failure of crystals; in a new impersonal determination of the velocity of light; and in adaptations of the electron microscope to tasks of wider scope than it could handle before.

BIBLIOGRAPHY.—If the names mentioned in this article are looked up in the indexes of *The Physical Review*, vols. 59 and 60 (1941), papers will be found containing hundreds of additional references to work done both in the U.S.A. and abroad. (T. H. O.)

Physiology. **Central Nervous System.**—Physiologists have known that the retina is a sensitive sensory end-organ. Its sensitivity has been remeasured by a new technique. The minimal quantity of light required to stimulate was found to be only eight or nine quanta, each quantum causing the necessary chemical change in one molecule of the chemically sensitive rhodopsin in the retina. No physical system is known which even approximates the retina in sensitivity. The motor or anterior horns cells of the spinal cord are not autochthonous. They operate only under the stimulus of arriving nerve impulses and when they are not so activated they produce no impulses which influence the state of the skeletal muscle. The removal or injury of the frontal lobes of the brain, besides producing the well known effects of euphoria and certain other changes in personality, renders it more difficult to remember in the presence of distraction. Such an injury also interferes with the judgment of abstract time, *i.e.*, the judgment of whether a period of elapsed time has been 10, 20 or 30 seconds. A study of the records of "brain waves" or electroencephalograms has indicated that migraine and epilepsy are related diseases.

DEVICE developed at Cornell Medical college, New York hospital, for measuring pain caused by migraine headaches. Research at the college demonstrated that all humans have precisely the same sensitivity to pain



Heart and Circulation.—The question of the nature of the tissue in the heart which conducts the wave of excitation and maintains the co-ordinated contraction of the cardiac muscle was reopened. It was reported that the modified neuromuscular tissue generally assumed to conduct the wave cannot be identified in the human and canine heart.

Hypertension was studied with vigour. One new point of special interest was reported. Actual ischaemia or a reduction in the blood flow of the kidney is said not to be essential for the production of hypertension, since the condition may be produced experimentally by decreasing the renal pulse pressure without reducing blood flow. The investigation of the cause of traumatic shock was renewed because of the war. The problem is as resistant as ever to solution. The usefulness of plasma in the treatment of the condition was established and some evidence indicated that the active principles of the adrenal cortex may be of value.

Digestion and the Liver.—Enterogastrone, the hormone which inhibits the secretion of acid by the stomach, was shown to prevent the formation of experimental ulcer. The relation of the chemical structure of the various bile acids to their choleretic properties was systematically studied. Among other observations, it was found that the administration of bile salts does not flush sediment from the gall bladder. Cirrhosis of the liver, which can be experimentally produced by numerous methods, was produced by a diet low in protein and high in fat. The fatty infiltration of the liver and subsequent cirrhosis can be prevented by adding choline to the diet. Choline is a constituent of lecithin which is found in such foods as milk and eggs. Alcohol in the presence of a diet containing too little protein, too little of the vitamins of the B-complex or too much fat simply increases the rate of development of cirrhosis.

Radioactive Elements.—The use of radioactive or labelled elements in the study of physiological processes continued to supply interesting and valuable information. When radioactive iodine is ingested it begins to accumulate in the thyroid gland in a few minutes, where it is changed into thyroid hormone within two hours. Radioactive strontium given by mouth is soon deposited in the bones, radioactive strontium being used instead of calcium because it is more easily made in the cyclotron. Using radioactive iron, it was shown that more iron is absorbed by the intestine when the body needs iron than when it does not.

Changes Associated with Growth.—The fact that *acne vulgaris* commonly occurs during puberty is well known. The belief that acne is in some way related to the production of the sex hormones has been substantiated. It has been found that acne can be induced in males and females, whose gonads are absent or not functioning, by the administration of the homologous sex hormone. Of course, this does not indicate that the production of sex hormone is the sole factor in the causation of acne. Two

provocative papers appeared which indicate that hormones, other than the hormone of the thyroid gland, are concerned in controlling the growth of the brain. The brain of the male rat is heavier than that of the female. Removal of the testes decreases, and removal of the ovaries increases, the brain weight. Another report indicated that the administration of the "growth hormone" of the anterior lobe of the hypophysis to mother rats increases the number of neurons in the cerebral cortex of the offspring. The functional significance of these observations was conjectural. (*See* also VITAMINS.)

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Pig Iron: *see* IRON AND STEEL.

Pigs: *see* HOGS; LIVESTOCK.

Pineapples. Only 30% to 40% of the pineapple crop of British Malaya was reported to have been harvested in 1941, because of the inability to ship to Great Britain. Britain ordinarily takes 80% of Malayan pineapple products. During the 1941 packing season (April to September), packers agreed to process a maximum of only 500,000 cases and to cease operations when unsold stocks reached 200,000 cases. Even before the outbreak of war with Japan and the invasion of British Malaya, it was reported that pineapple planting would be greatly reduced, and the practice of growing pineapples between young rubber trees would be curtailed. Shipments of pineapples to the United States from Hawaii, principal source of canned pineapple and pineapple juice, ceased in Dec. 1941 with the outbreak of war with Japan. Hawaii shipped annually more than 400,000,000 lb. of canned pineapples to the United States, but only a comparatively small quantity of fresh pineapples. Cuban shipments of pineapples to the United States in 1941 were greatly reduced because of shipping difficulties. Cuba exported to the United States in the first ten months of 1941 only 959,000 crates of fresh pineapples, compared with 1,021,455 crates in the same period of 1940. Bulk shipments of fresh Cuban pineapples to the United States in 1941 were 968,822 lb. for the first ten months; 3,704,580 lb. in 1940. Florida is the only state in the United States that produces pineapples. The Florida crop in 1941 was estimated at 10,000 boxes (70 lb. net to the box). The 1940 crop was 8,000 boxes, and the ten-year (1930-39) average was 14,550 boxes. (S. O. R.)

Pittsburgh. Tenth largest city of the United States, Pittsburgh had a population of 671,659 by the federal census of 1940. It is in the southwestern part of Pennsylvania, at the junction of the Monongahela and Allegheny rivers. Area, 54,295 sq.mi. (excluding rivers). It is the centre of a metropolitan district of some 130 contiguous cities, towns and boroughs, with a total population of about 1,954,000 in 1940. Mayor (Jan. 1, 1942): Cornelius D. Scully, re-elected in Nov. 1941.

The most significant development in Pittsburgh in 1941 was the almost complete absorption of industry in production for national defense. For the first time in 130 years a United States vessel of war was launched within greater Pittsburgh, when in October the "P C 490" went down the ways at the Neville island plant of the Dravo corporation. Fourteen more of these 165-ft. submarine chasers were scheduled to be launched from these boat yards. Steel mills operated at capacity or near-capacity throughout the year, and production figures showed a marked increase in every field.

As a result of a study made by traffic experts during 1941, the Pittsburgh Regional Planning association recommended a plan for the improvement of transportation facilities in the city. A part of this plan was to carry route 22 and route 30 through the city on an adequate boulevard. Work proceeded rapidly on this plan. The second part of the plan was to encircle the city by boulevards. The Water street section of this loop, along the Monongahela river, was complete in 1941, and work on the Duquesne way section, along the Allegheny river, was nearly completed.

Pittsburgh took steps during 1940 toward abatement of the smoke nuisance. A newly created smoke commission recommended, after a four months' survey, that industrial and domestic consumers burn either a smokeless fuel or use mechanical equipment for efficient coal burning. The recommendations of the commission were approved by the city council. (J. G. Bo.)

Pius XII (1876–), the 262nd successor to St. Peter in the See of Rome, was elected by the assembly of cardinals on his 63rd birthday, March 2, 1939, and was enthroned on March 12. (For details of his early life, see *Encyclopædia Britannica.*) As pope he is held to be the vicar of Jesus Christ on earth and supreme spiritual ruler of the universal church. He was born in Rome, the son of an ecclesiastical advocate, Filippo Pacelli, and given the baptismal name of Eugenio. Having entered the priesthood, he was attached to the papal secretariate of state, later was appointed papal nuncio to Bavaria and Germany, was created cardinal in 1929 and became papal secretary of state under Pius XI in 1930.

As supreme pontiff his spiritual power extends over the estimated 400,000,000 Catholics scattered throughout the world. These are to be found in all the warring nations, and his concern is for all of them, as for his spiritual children, no matter what their racial or civil allegiance may be.

His words and his actions have been solely directed toward the attainment of peace in a war-torn world, but a peace founded on justice and charity. His policy as the temporal ruler of the independent Vatican City state has been that of the strictest neutrality. Nevertheless, he has not ceased, nor has he feared, to brand as evil the tenets of a totalitarianism that would destroy human and divine rights and liberties. Out of a darkened Europe, his is the one voice that can be raised with courage and impunity.

His most notable pronouncement was broadcast on Christmas Eve. On the same date in 1939 he proposed the five points necessary for a just and honourable peace. In 1940 he outlined the "indispensable prerequisites" for any new world order. In 1941, in a long discourse condemning the war of extermination and blaming the ills of the world on the abandonment of Christianity and the adoption of a new paganism, he enunciated five conditions that must govern "a new order founded on moral principles": (1) there must not be a violation of the freedom, integrity and security of other states, no matter what their size or strength may be; (2) there must not be a professed or concealed suppres-

sion of the culture, language or characteristics of national minorities, nor the hindrance or restriction on their economic resources, nor the limitation of their natural fertility; (3) there must not be a cold and calculating greed that hoards the economic resources and materials destined for the use of all, to the extent that less favoured nations are not permitted access to them; (4) there is no place in the new order for a total warfare or for a mad rush to armaments. "The calamity of a world war, with the economic and social ruin and the moral dissolution and chaos which follow in its trail, should not be permitted to envelop the human race for a third time"; (5) there can be no place for the persecution of religion and the church. The address was interpreted as a condemnation of authoritarian government. Favourable reference was made to the Churchill-Roosevelt eight-point program.

Notable utterances were made frequently in the course of 1941, condemning the war and causes which led to it, seeking peace "in justice and charity, in honor and freedom for all." In May he ordered prayers for peace to be said continually through the month. At Easter he appealed to the warring nations to restrain from "still more homicidal instruments of warfare." Later, in April, he urged clemency on the part of the war victors.

In June, in a Pentecost broadcast, commemorating the 50th anniversary of the labour encyclical of Leo XIII and the tenth anniversary of that of Pius XI, he affirmed the "three fundamental values of social and economic life," namely, the proper distribution and use of material goods, the rights of labour, and "the right of the family to a vital space." Speaking in English on the occasion of the Eucharistic congress held in St. Paul, Minn., June 26, he deplored the "black paganism" sweeping over humanity today, and urged more intensive prayer and self-sacrifice. He stressed the same theme in the international broadcast to the Eucharistic congress held in Chile, Nov. 9, and begged that "the gift of faith" be preserved "despite the increasing immorality, dissolving incredulity and reborn paganism."

Under the immediate direction of the pope, diplomatic relations of the Vatican with various nations were conducted, relief work for war victims, prisoners and refugees was carried on. Personally, he held conference with foreign representatives, such as Myron C. Taylor, of the United States, and the Japanese foreign minister, Yosuke Matsuoka. In his spiritual function, he continued to spur the faithful to a more intensive following of the teachings of Christ. (*See* ROMAN CATHOLIC CHURCH; VATICAN CITY STATE.) (F. X. T.)

Plague, Bubonic. During 1941 plague infection was found in rats in San Francisco and in neighbouring cities along the Pacific coast. Sharp outbreaks occurred among ground squirrels in the southern and in the extreme northern counties of California, more than 500 mi. apart. The disease had never been found previously in the northern counties, nor was it known to have occurred among the ground squirrels (*Citellus douglasii douglasii*) prevalent in that area. At the time of this epizootic two fatal cases occurred in children in a northern county. The discovery of the disease in rats in San Francisco during 1941 arrested attention; no such finding had been made since 1908, although 30,000 or more rats had been collected and examined annually since that date.

During 1941 infected marmots (*Marmota flaviventris*) and ground squirrels (*Citellus armatus*) were found in the 11th state, Colorado, and with the extension of the investigations eastward, to include the western fringes of the plains states, infection was found in fleas from ground squirrels (*Citellus richardsonii*) in North Dakota within a few miles of the southern boundary of Canada.

Infected parasites have been found in practically all the locations in which diseased animals were obtained, and in some areas and locations in which infected animals were not obtained, and where the species usually found infected are not permanent inhabitants.

A sharp epizootic was also discovered in 1941 among ground squirrels (*Citellus townsendii mollis*) in the environs of the city of Boise, Ida., on the boundary of a military reservation. During 1941, 26,494 field rodents were collected and infection was found among rodents taken in 12 well separated locations in seven states other than California. With the discovery of infection in Douglas squirrels, it has been determined that a reservoir of plague exists in 24 species of wild and domestic rodents scattered over the western states. Fifty species of fleas have been collected from the various wild rodents, and many of the species included have been shown capable of becoming infected through experimental feeding on laboratory animals suffering with a septicaemia of plague.

The surveys to determine the prevalence of plague have been made by the federal government with the assistance of a few of the states involved. Since field rodents have been found to be infected within and near military reservations and near large civilian communities in which the rat populations may become infected, efforts were being made by the United States public health service to extend these investigations and to enlist greater participation by the states both in surveys and in measures to suppress rodents in and about civilian and military communities.

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Plastics Industry. The use of plastics for defense purposes, which was considerable in 1940, took on a major crescendo in 1941. They were not only sold in increased amount in their normal markets, but because of the mandatory withdrawal of many metals from civilian uses, plastics were called upon to act as substitutes for such metals insofar as their properties would permit.

It was not possible to obtain figures for the 1940 production in Germany or France. It was believed that the 1941 world production of all plastics was upwards of 450,000,000 lb., including plastic resins used in coatings.

The 1940 production in the United States could be given with reasonable accuracy. The total of all plastics, excluding alkyds used for coatings, was estimated to be approximately 180,000,000 lb. The output of phenolic resins increased about 17% to 33,000,000 lb. while urea resins increased 30% to 22,000,000 lb. Cellulose acetate moulding powder increased 28%, which more than offset the 11% decrease in cellulose nitrate, keeping the cellulose group at about the same level, namely, 35,000,000 lb.

Obviously, information as to use of plastics in Germany, and other belligerent countries, was slight, but study of captured German aeroplanes indicated a large use of fabric impregnated with phenol and urea formaldehyde, also methyl methacrylate, polystyrene and vinylite.

German production of synthetic rubber required the production of large quantities of styrene, butadiene and acrylonitrile, which are also intermediates in the production of plastics. The low cost secured by the large production induced a consequent increase in the amount of plastics made from these materials.

Scattered items of information from Germany indicated the use of cellulose triacetate for transmission belts, the use of polyvinyl chloride for wire insulation, for bristles and for chemical tank lining. Other reputed applications were those of moulded phenol formaldehyde for drive shafts and other parts of sewing machines. Because of its water resistance, melamine formaldehyde was used for bathroom fixtures.

In Great Britain there was an enormous increase in the use of plastics for defense; censorship, however, withheld vital information. Items that might be cited were melamine formaldehyde for plywood adhesives, development of many flexible substitutes for glass; urea formaldehyde for instrument scales, toilet flush bowl floats and stuffing boxes; polyethylene for insulated cables, fabric reinforced phenol formaldehyde for cams, screws, nuts and fittings in railroad cars; and cellulose acetate for eyeshields to protect against gas droplets.

It was stated in a letter from London that large quantities of "scratch-proof, unbreakable" polystyrene were moulded as ophthalmic spectacle lenses for soldiers, requiring 8,000 dies.

As in 1940, mechanical improvements in compression, as well as injection moulding machines continued and in 600 plants there were 11,000 compression and 1,000 injection moulding machines in use in 1941.

A new method of fabrication, namely, extrusion moulding, increased the use of cellulose acetate, cellulose acetate butyrate, methyl methacrylate and polystyrene. In this process moulding powder is fed into a screw stuffer from which emerges a formed strip of any desired cross section. These strips are used for wall mouldings, shelf edgings and other decorative trim, replacing aluminum and stainless steel.

The automotive industry continued to use quantities of cellulose acetate, cellulose acetate butyrate, methyl methacrylate, phenol formaldehyde and urea formaldehyde in interior fittings and outside decorations. There were some 110 plastic parts in the 1941 automobile, ranging from upholstery buttons to steering wheels, from accelerator pedal to laminated safety glass interlayer.

Another volume market was that of refrigerator parts. Certain refrigerators used 39 plastic parts. An insulating frame used in one make was said to be the largest piece ever injection-moulded.

Although not in commercial production, an automobile with a complete

plastic body was built, the material being phenol formaldehyde plus soybean, and filled with wood fibre pulp.

Phenol formaldehyde continued to be the largest volume item, especially in its laminated form and it invaded new fields. In the aeroplane industry it found use as follows: pulleys, instrument boards and control tabs. In its laminated form it was used as a floor covering and, in conjunction with soybeans, for tractor seats. In its cast form it entered the toilet brush back market in considerable quantity. Sulphonated, it was used in water-softening plants with a great degree of success. It was widely employed as a plywood adhesive.

Urea formaldehyde increased its application in novel types of lighting fixtures and was used in larger quantity for articles such as bed lamps, door chimes, piano keys and tissue dispensers. As an adhesive, with casein, it found wider use with plywood and as a generally useful cement. Plywood with urea formaldehyde adhesive was made into fabric-covered panel boards as large as 8x20 ft.

Cellulose acetate and cellulose acetate butyrate moulding powders increased their use in places too numerous to mention. Some of the newer articles were fluorescent fish lures and electric switches, children's bassinets, stage scenery, refrigerator parts, head protectors for baseball players, a wide variety of dress trimmings, beer-cooling coils, children's toys, clothespins, Christmas tree ornaments, book bindings, arch supports and oil dispenser cups. A compression moulded bus shade, 33 in. by 17 in. by 0.0195 in., made from cellulose acetate butyrate, was one of the largest compression-moulded pieces made up to 1941.

Cellulose nitrate, although in 1941 being substituted by cellulose acetate, continued to be made in large quantities.

Methyl methacrylate production continued its increase and this beautiful plastic found many new uses. Its toughness, clarity and light weight made it almost an essential material for cockpit and bomber enclosures in military aeroplanes. Other new uses were acid-resisting vegetable and fruit knives, brush backs, illuminated typewriter platens, all-plastic dentures, contact eye lenses, transparent silver chests, machine guards, beer dispenser boxes, machinery models, miniature furniture, house numerals, toothbrush handles and juice extractor parts.

The polyvinyl resins, as a group, were widely used for defense, the vinyl chloride-vinyl acetate copolymer being used in large quantities for wire insulation. As rigid sheeting, the same copolymer was used in shower curtains, aeroplane cockpits, in gas masks, sound records, storage battery separators, watch crystals, and dress trimmings. Its use was continued in flexible suspenders, belts and wallets. As vinyon it formed acid and alkali filter cloths.

Vinylidene chloride, a new plastic introduced in 1940, found added application as fishline leaders and water pipes.

Polyvinyl butyral was considered the best plastic interlayer for automobile safety glass.

Nylon, the new synthetic monofilament, was more widely employed for bristles, with added applications as tennis and badminton racket strings.

Polystyrene, because of its clarity and easy moulding properties, enjoyed a greater market, among the articles made being salad sets, fluorescent light diffusers, hair curlers, toys and bathroom tiles. (*See* also CHEMISTRY; INDUSTRIAL RESEARCH; PAINTS AND VARNISHES; RAYON; RUBBER AND RUBBER MANUFACTURE; TEXTILE INDUSTRY.) (H. W. PA.)

Platinum. Lacking data from both Canada and the soviet union, each of which supplies about 35% of the total world platinum output, no estimates could be made of world output. There was no news as to the effect of the war on Russian operations, and in Canada all that was known was that nickel output was being pushed to the limit, and presumably the output of platinum and palladium that accompany nickel was increasing proportionately.

Although formerly only a minor producer, the United States since 1938 had been producing a material proportion of its platinum requirements from deposits in Alaska. The 1940 output included about 36,500 oz. of crude and 4,500 oz. recovered as a by-product in the refining of copper and gold. The latter might be expected to increase with the growing demand for copper, but no information was available on the output of Alaskan crude in 1941. Imports of platinum into the United States in 1940 were at the highest level, the average monthly receipts being 15,580 oz. in 1939, 10,560 oz. in 1940 and 17,540 oz. in the first eight months of 1941. Corresponding figures for exports were 11,655 oz. in 1939, 5,280 oz. in 1940 and 2,000 oz. in the first eight months of 1941. Formerly much of the Alaskan crude had been sent to Great Britain for refining, but the export data would seem to indicate that this had been stopped. There was in 1941 no report of shortage in supply.

Production of crude in South Africa in the first half of 1941 was 25,814 oz., against 38,809 oz. in the same period of 1940. Colombia, the producer of nearly three-quarters of the total, reported 14,135 oz. of crude in the first half of 1941, against 24,294 oz. in the full year 1940. The South African material carries about 60% platinum and the Colombian about 80%.

(G. A. Ro.)

Plums and Prunes. Production of plums and prunes in the United States in 1941 averaged generally higher than in 1940. No production figures were forthcoming from Yugoslavia, the leading plum and prune producing area of Europe.

Table I.—*U.S. Production* of Plums and Prunes in Tons, Fresh Basis*

	1941	1940	1930–39 average
Plums			
California	74,000	69,000	64,600
Michigan	6,800	5,800	5,580
Prunes			
Oregon	93,300	42,700*	110,400
Washington	26,300	17,500	31,450
Idaho	22,100	21,500	17,570

*Estimates include quantities sold and used on the farm for household consumption.

Table II.—*Quantities of Prunes Used Fresh, Canned and Dried, in Tons*

	1941	1940	1930–39 average
Used fresh (fresh basis)			
Idaho*	22,100	21,500	16,900
Oregon	15,400	10,900	10,650
Washington	10,600	8,410	13,860
Canned (fresh basis)†			
Oregon	30,000	11,300	15,020
Washington	7,700	8,700	4,710
Dried (dry basis)‡			
California	182,000	175,000	207,100
Oregon	6,010	2,000	21,780
Washington	400	110	2,890

*Includes small quantities of prunes canned and dried. †Includes small quantities for cold packing. ‡The drying ratio in Washington and Oregon ranges from 3 to 4 lb. of fresh fruit to 1 lb. dried; in California, 2½ lb. fresh to 1 lb. dried. In 1941 the equivalent of 11,000 tons of dried prunes, and in 1940 the equivalent of 9,000 tons of dried prunes were not harvested in California because of market conditions.

(S.O.R.)

Pneumonia. Statistical evidence continued to accumulate indicating the effectiveness of the various sulphonamide derivatives in the treatment of pneumonia. The fatality rate, with such treatment, in general lies around 10%. In uncomplicated cases treated early in the course of the disease, it is even lower than this figure, ranging from 4% to 6%. This represents a tremendous reduction from the fatality rate of 25% to 35% expected in the pre-chemotherapeutic era.

Attempts have been made to define the type of case which should receive serum in addition to drug. Theoretically the combination should be better than either agent used separately: serum therapy provides a specific antibody, chemotherapy acts by bacteriostasis. However, statistical evidence has not demonstrated this to be the fact. Thus in a two-year study conducted at Bellevue hospital, New York city, Plummer and his associates found no significant difference in the fatality rate between a large group of patients with pneumonia half of whom received drug alone and the other half drug plus serum.

While these results have been disputed, the sulphonamide compounds have in general displaced the routine use of type specific antipneumococcus serum.

There are, however, two definite groups of patients in whom serum is indicated: those who are hypersensitive or tolerate the sulphonamide compounds poorly, and those in whom there is no response to chemotherapy in 36 to 48 hours.

The newest of the sulphonamide derivatives, sulphadiazine, would appear to be the drug of choice for the treatment of pneumonia. It is as effective as either sulphapyridine or sulphathiazole, and in addition possesses other advantages. The troublesome nausea and vomiting encountered so frequently with sulphapyridine is practically absent with sulphadiazine, and other toxic reactions also seem to be less frequent. It is more readily absorbed from the intestinal tract, and excreted more slowly so that

higher blood levels are more readily reached and maintained. It is less prone to conjugation than the other sulphonamides and its acetyl form is more soluble in the urine than the conjugated products of sulphapyridine and sulphathiazole, with the result that renal damage is less apt to occur.

Reports of toxic reactions to the various sulphonamide derivatives continued to appear. These range from slight nausea to disappearance of white blood cells. Compared with the widespread use of sulphonamides, the number of disastrous reactions was relatively small. The potential toxic dangers from chemotherapy have probably been overemphasized. If the rare patient who is hypersensitive to the sulphonamide derivatives is eliminated, the majority of toxic reactions can be prevented by careful observation of the patient, including frequent examination of the blood and urine and the discontinuance of the drug promptly on any signs of toxicity. (*See* also CHEMOTHERAPY; EPIDEMICS AND PUBLIC HEALTH CONTROL; MEDICINE.)

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Poetry: *see* AMERICAN LITERATURE; CANADIAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; LITERARY PRIZES; PUBLISHING (BOOK); SPANISH-AMERICAN LITERATURE.

Poison Gas: *see* CHEMICAL WARFARE; MUNITIONS OF WAR: *Air-bombing.*

Poland.

The area of Poland prior to the German invasion on Sept. 1, 1939, was about 150,470 sq.mi.; the population was estimated Jan. 1, 1939, as 34,775,700. On Sept. 29, 1939, after the conquest of the country was virtually completed, Germany and the U.S.S.R. partitioned Poland and set up a new boundary which, running from north to south, roughly followed the Pissa, Bug and San rivers. The Germans then divided their territory into two sections; one, including the provinces of Pomorze, Posen, Upper Silesia and Lodz, was directly annexed to the Reich; the rest was constituted as the Gouvernement General of Poland, under German administration, with Cracow as the capital.

History.—When on June 22, 1941, Hitler launched his attack on the U.S.S.R. and the Russians resisted, a basis was created for collaboration between Poland and the U.S.S.R. The following day Gen. Wladislaw Sikorski, the Polish prime minister and commander in chief, expressed his readiness to terminate the abnormal situation existing between the two countries, on honourable terms acceptable to both sides. Moscow responded. But the negotiations for an agreement creating a basis for future relations were not easy, in view of the fact that the soviet government had proclaimed the annexation of the eastern provinces of Poland—an area of 77,800 sq.mi., with a population of 13,800,000. The Polish government insisted on the renunciation of all territorial consequences of the 1939 German-soviet agreement. The soviet government agreed, however, only to declare "the soviet-German treaties of 1939 regarding territorial changes in Poland as having lost their validity." Three members of the Polish cabinet disagreed with this formula and resigned. None of them, however, opposed the principle of a settlement with the U.S.S.R. On the recommendation of the prime minister the Polish president, Wladislaw Raczkiewicz, appointed Count Edward Raczynski, the ambassador in London, acting foreign minister; he also named Stanislaw Mikolajczyk (Peasant party) deputy prime minister; and Karol Popiel (Christian Democratic party) minister without portfolio. On Dec. 5 a Russo-Polish pact of mutual assistance and collaboration was signed in Moscow.

The second outstanding event in Poland's foreign policy in 1941 concerned its relations with Czechoslovakia. Animated by the solidarity which inspired their joint declaration of Nov. 11, 1940, the governments of Poland and Czechoslovakia announced at the Inter-Allied meeting in London on Sept. 24, 1941, that they were convinced of the necessity of establishing after the war a confederation between the two countries.

Following the extension of hostilities to the Pacific, the Polish government declared war on Japan on Dec. 12.

The Struggle Outside Poland.—During 1941 the Poles continued to wage war on the enemy outside their own country, by the side of their allies. The Polish air force, commanded by Air Vice-Marshal Stanislaw Ujejski, had twice the strength it had at the time of the German attack on Poland. From the time of their arrival in Great Britain in June 1940 to the end of Nov. 1941, Polish fighter squadrons destroyed 410 enemy aircraft. Polish

CIVILIAN POLES being marched through a Silesian town on their way to execution by German military police, according to the photographer who smuggled the picture out of Poland in 1941

bomber squadrons took part in 277 raids, with 1,302 aircraft. The Polish navy, under Vice-Admiral Swirski, had in action six destroyers and three submarines. Polish land forces included an army corps co-operating in defense of Britain and a Polish brigade fighting in Libya. After the signing of a Polish-soviet military accord in Moscow Aug. 14, a Polish army of four to six divisions under Gen. Wladislaw Anders was in formation somewhere beyond the Volga; finally, General Bronislaw Duch was recruiting a Polish unit in Canada. On Sept. 4 President Roosevelt authorized lend-lease aid to the Polish forces. The Polish merchant navy actively co-operated with Great Britain. Four ships, including the transatlantic liner "Pilsudski" were lost; and the Polish merchant navy at the close of 1941 numbered 32 vessels totalling 100,000 tons.

Under German Occupation.—After the Russian-occupied territories of Poland had been taken by the German forces, eastern Galicia was included in the Gouvernement General on Aug. 1, 1941. Wolyn (Volhynia) was left as a separate district. The northeastern parts of Poland, with Lithuania and Latvia, were incorporated in a new German creation, known as the "Ostland." Hans Frank, head of the Gouvernement General, in a speech in Berlin on Nov. 18, thus defined German policy toward the Polish nation, "The Polish nation must be freed from bearing the responsibility for its own political destiny, because it has again sacrificed the peace of other nations; it must be restricted to a small area of settlement, since by numbers it belongs to the secondary nations of Europe; strict and unequivocal demarcation between what is German and what is Polish is the right of the German nation."

The Poles refused Hitler's repeated suggestions of a joint campaign against Russia (cf. *Polish White Book*), and showed unwavering determination in their resistance against the invader. With some 140 secret newspapers and broadsheets, Poland in 1941 had the largest underground press in German-occupied Europe. German rule in Poland was therefore more ruthless than anywhere else. (K. SM.)

Polar Regions: *see* EXPLORATION AND DISCOVERY.
Pole Vaulting: *see* TRACK AND FIELD SPORTS.

Police. The existence or imminence of war continued to be the greatest single factor in police development. In those portions of Europe, Asia and South America which had organized their police under national rather than under local auspices, police became to all intents and purposes organic parts of the military machines on the home fronts. The same influences toward centralization were apparent in the British Isles and the dominions, in the United States and in Latin America. Even though in the English-speaking countries police retained their essentially civil character despite the impact of war conditions, there was a noticeable tightening of central (*i.e.*, national) direction and control over the operations of local police agencies which still were commanded, organized and supported on a local basis. All found themselves heavily engaged in air-raid precautions, with additional responsibilities for assisting the civil population to meet unrestricted air warfare in both military and nonmilitary zones. Threats of invasion and occasional blackouts in Canada and the United States imposed new and unfamiliar duties upon the police of both countries. Police commanders were besieged at every turn by local vigilance committees, by state and county defense councils and by a wide variety of national agencies, to tighten the existing regulatory devices, to devise new types of regulations to meet anticipated emergencies, to provide special training for the rank and file of police, to organize auxiliary police, to add this or that type of equipment, to prepare plans for the speedy evacuation of civilians in extensive areas and to serve on a host of co-ordinating committees. As the year closed the over-all situation was still greatly confused, with some evidence that too much rather than too little had been attempted, and that only in the relatively familiar field of counterespionage and antisabotage investigations had police generally succeeded in showing tangible results for so much feverish effort.

In the United States, the Federal Bureau of Investigation (*q.v.*) extended its supervision over espionage and sabotage cases, handled in the first instance by state and local police, and it appeared probable that local police trained in the FBI national police academy since 1935 would be called into federal police service.

New York, New Jersey, Virginia and Connecticut, which had led the way in developing state-wide police mobilization plans in 1940, increased their efforts along these lines. Maine, Delaware, Maryland and Michigan took similar action in 1941, with Rhode Island, Ohio and other states preparing to do so. In addition, an extensive training program for local police was instituted in anticipation of the war emergency, with many temporary zone schools set up by the FBI and collaborating agencies. Particularly on the east and west coasts, auxiliary police were sworn in by local authorities, with a number of states instituting state guards (militia) to take the place of the national guard organizations that had been called into federal military service.

The burdens imposed upon local communities by the recruitment of auxiliary police evoked demands upon the federal government for financial aid in meeting such extraordinary demands, but no well defined plans to that end were in existence at the close of 1941.

The ever-widening effects of military censorship and the increasing difficulties of oceanic transport served to limit still further the free interchange of specific information on the extent and character of police establishments and the changes and developments that the year had brought. Even in Great Britain the free flow of official and unofficial reports on police was finally stemmed, and for the time being, at least, these sources of information were no longer available.

In the United States, however, there was no such interruption. So far as the regular police personnel was concerned, it was clear that no important changes in numerical strength, organization or control as yet had occurred. Latest figures (1940), covering 2,609 cities, towns and villages, are summarized from the *Uniform Crime Reports* in Table I.

Table I.—*Numerical Strength of Municipal Police in U.S.*

Population Groups of Cities	Number of Forces Filing Returns	Population Represented	Number of Police per Thousand of Population
Group I—over 250,000	37	30,195,330	2.12
Group II—100,000 to 250,000	55	7,792,050	1.45
Group III—50,000 to 100,000	106	7,204,710	1.37
Group IV—25,000 to 50,000	213	7,417,093	1.23
Group V—10,000 to 25,000	596	9,030,389	1.05
Group VI—Under 10,000	1,602	8,301,918	1.01
Totals	2,609	70,101,108	1.61

These figures represent a slight reduction from the levels of the preceding year (when the ratio for all cities represented reached a total of 1.65 police per 1,000 of population). The impact of the war upon seaboard communities now promised, however, to raise police quotas to hitherto unexampled heights, owing to the addition of auxiliary police (most of them part-time and partially trained) to the regular establishments. Crimes cleared by arrest in 1940 showed a further falling off in this form of police efficiency, as measured against the peak year of 1938, in all major categories except murder. As usual, police cleared more crimes against the person, ranging from 88.7% (for murder and nonnegligent manslaughter) down to 73.7% (for aggravated assault). Arrest clearances of crimes against property again reflected a less favourable situation than in the case of crimes against the person, ranging from 23.4% for larceny or theft (a decline from 25.4% in 1939) up to 41.8% for robbery. Table II summarizes the record of crimes cleared in 1940 in 1,212 cities having a total population of 41,146,894.

Reasons for the continued decline in the index of police effectiveness were by no means clear. Aside from the very real possibility that the somewhat inferior records for 1939 and 1940 represented a mere reaction from the peak figures attained in 1938, it seemed probable that the dispersal of considerable numbers of police on strike duty, and the effects of impending war in diverting police attention from the suppression of crime toward preparations in national defense, were probably responsible.

Concurrent with such changes were the marked declines in the number of police killed by criminals. During much of the prohibition era, and the years immediately following it, police in the United States had been subject to unusually high fatality rates, which in turn gave rise to conjecture concerning the degree of their freedom from underworld association, and their effectiveness in the use of police weapons for self-defense. The figures ap-

Table II.—*Per Cent of Crimes Cleared by Arrest, in U.S. Cities, 1940*

Murder and Non-Negligent Manslaughter	Negligent Manslaughter	Rape	Robbery	Aggravated Assault	Burglary, Breaking or Entering	Larceny, Theft	Auto Theft
88.7	83.4	79.4	41.8	73.7	33.1	23.4	23.8

pearing in Table III, if later confirmed by the records of succeeding years should go far toward removing public anxiety on this score.

Table III.—*Police Killed by Criminals—Rates per 5,000,000 Inhabitants in Cities over 25,000 Population, 1937–40*

Year	Rate	Year	Rate
1940	1.24	1938	3.91
1939	1.79	1937	3.91

Highest rates (1940) were recorded in the south Atlantic and Pacific states (4.33 and 2.06 respectively). In three of the nine geographical regions —namely, in the New England, west north central and east south central states—no police were killed by criminals during 1940. For the cities of the United States as a whole, the lowest rates were recorded in cities of the lowest population group (from 25,000 to 50,000 population). Their combined rate of 0.67 was but slightly more than one-half that for cities throughout the country as a whole.

The ever-widening effects of war were not conducive to international conferences on police techniques. However, the International Association of Chiefs of Police (in which U.S. and Canadian memberships heavily predominate) held its 48th annual police congress at Buffalo, N.Y., in Sept. 1941. Special emphasis was there placed upon the extraordinary traffic conditions that might be anticipated in the war emergency, together with the experiences of British communities in handling air-raid precautions and defense. Also notable were the numerous regional meetings of state police executives from the United States and Canada. Sponsored by the state and provincial section of the International Association of Chiefs of Police, they served to consolidate portions of the police defenses along both the criminal and the war emergency fronts.

The Office of Civilian Defense (*q.v.*) dispatched a special police mission to London for the purpose of studying at first hand the organization and functioning of English police establishments under war conditions, and particularly the various techniques employed in protecting life and property from the effects of intensive air raids. (*See* also CRIME; KIDNAPPING; SECRET SERVICE.)

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Poliomyelitis: *see* INFANTILE PARALYSIS; NERVOUS SYSTEM.

Political Parties, U.S.: *see* COMMUNISM; DEMOCRATIC PARTY; ELECTIONS; REPUBLICAN PARTY; SOCIALISM.

Polo. In the U.S. in 1941 all the usual events of the season were held, with the National Open and Monty Waterbury Memorial Cup tournaments, most important of all the championships, both being won by the Gulf Stream team, which consisted of J. H. A. Phipps, Michael G. Phipps, Charles S. von Stade and Alan L. Corey, Jr.

The National Twenty Goal championship was won by the Bostwick Field team of Sidney Culver, George H. (Pete) Bostwick, Charles S. von Stade and Alan L. Corey, Jr. All these events were played at the Meadow Brook club, Westbury, L.I.

The Oak Brook club, near Chicago, Ill., was the site of the year's National Inter-Circuit and Twelve Goal championships, with the Houston Huisache team of Texas winning the Inter-Circuit for the fourth time since 1935 while the home club captured the Twelve Goal. Huisache played with Robert D. Farish, William Dritt, Robert S. Nichoalds and Rudolph Humberson, while Oak Brook lined up with Harry Owen, Jr., Paul Butler, Dan Peacock and Charles Aaberg. Yale won the intercollegiate championship for the second successive year.

There was no formal international competition during the year although two high-goal teams went to Mexico City, one in February and one in November, for a series of games with the Mexican army. The latter team was organized and captained by Winston Guest.

Cecil Smith was dropped from ten goals to nine on the Polo association's handicap list, thus leaving Stewart Iglehart as the only ten-goal player in the United States in 1941. (R. F. K.)

Poorten, Hein ter (1887?–), Dutch army officer, was trained at Holland's Royal Military academy. He took an early interest in aeronautics, was one of the first Netherlands officers to obtain a pilot's licence, and won an international prize for a balloon flight. Poorten, who long advocated increasing the air arm of Dutch armies, made several visits to the United States to study aircraft and purchase planes. A veteran of 30 years' service in Holland's Asiatic colonies, he was made commander in chief of the Netherlands East Indies army and head of the war department in Oct. 1941. Aside from his achievements in aeronautics, Poorten is rated as an expert in gunnery and jungle warfare. After Japanese invasion forces landed on the island of Borneo in late December 1941, he called upon the Allies for more bombers, fighting planes and anti-aircraft guns.

Popham, Sir Robert Brooke-: *see* BROOKE-POPHAM, SIR ROBERT.

Population, Movements of: *see* REFUGEES.

Populations of the Countries of the World: *see* AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

Porter, Edwin S. (1869?–1941), U.S. motion picture director of the silent film era, was born in Pittsburgh, Pa. In the 1890s he joined the Edison company as a cameraman. Porter experimented with a narrative technique and screened, in 1903, *The Life of an American Fireman*, the first story film. Two years later he produced *The Great Train Robbery*, a western "horse opera" packed with thrills and romance, which was given its première at a Pittsburgh nickelodeon. The film, an immediate success, became a milestone in the history of the movies. Porter's fame boomed, and from 1905 to 1917 he turned out scores of box-office successes, starring such favourites as Pauline Frederick, John Barrymore and Mary Pickford. In later years he devoted himself to designing new devices for the camera and projector. He died in New York city, April 30. (See *Encyclopædia Britannica.*)

Porto Rico: *see* PUERTO RICO.

Portugal. A republic of western Europe, forming part of the Iberian peninsula and bounded on the N. and E. by Spain and on the S. and W. by the Atlantic ocean. Area (including Azores and Madeira), 35,670 sq.mi.; pop. (est. Dec. 31, 1939), 7,539,000. Chief towns: Lisbon (cap. 594,300), Oporto (232,280). President: Gen. Antonio Carmona; language: Portuguese; religion: Christian (mainly Roman Catholic).

History.—Notwithstanding abnormal conditions, the second budget report to be published since the beginning of World War II showed a surplus of 500 contos (=500,000 escudos). This was due to a slight increase in ordinary revenue (despite a considerable drop in customs revenue) and to a decrease in public debt charges resulting from the conversion of the external debt. The report foreshadowed increased taxation, a limitation of certain services (severe cuts in railway services had already been made) and the suspension of plans approved under the ministry of public works. It believed that, thanks to 12 years of prudent administration and financial equilibrium, no major crisis was likely to occur. This hope was subsequently confirmed by the publication of the 1940 balance sheet, which showed an actual credit balance of 174,000 contos. The figures for Portuguese foreign trade for the first half of 1941, on the other hand, showed a large decline

in both exports and imports.

In mid-February almost the whole of Portugal was swept by a cyclone, which was followed by extensive floods. An approximate estimate of the damage put it at some 12,000,000 contos, or nearly half the country's total revenue during 1940.

Maintaining its neutrality in the war, Portugal started a national scheme which, by co-ordinating the efforts of other countries, collecting grants and setting up an assistance bureau, as well as by private hospitality, would help some of its child victims.

Relations with Britain were excellent. The new ambassador, Sir Ronald Campbell, presented his letters of credence on Jan. 8. In April a delegation from Oxford university held a convocation at the University of Coimbra and conferred the honorary degree of D.C.L. upon Dr. Oliveira Salazar, who on his 52nd birthday (April 28) was accorded a striking demonstration of popular confidence in Lisbon. In July and August the British and Portuguese governments concluded a large sardine contract and agreed upon measures to avoid a rice shortage in Portugal. In September leaders of the Portuguese Youth movement visited Britain to study youth organizations. Imports and exports between the two countries increased by about 20% in 1940.

The landing of Allied troops (Dec. 18) in Portuguese Timor necessitated by Japanese submarine activity in that region (the Japanese acquired a commercial airport on Timor in October) was immediately discussed in the Portuguese national assembly. It was then revealed that Portugal had previously accepted a British offer of help if Timor were attacked and that Portuguese reinforcements for the garrison were in preparation. Britain had undertaken to withdraw the troops as soon as the emergency was over.

An extensive literature relating to the centenary celebrations of 1940 began to appear. More than 30 volumes of historical studies were announced. (E. A. P.)

Education.—Elementary (1937) schools 7,890; scholars 734,922; secondary (1936–37) schools 45; scholars 18,055; universities (1936–37) 3; students 5,871.

Banking and Finance.—Revenue, ordinary (est. 1940) 2,041,800,000 escudos; expenditure, ordinary (est. 1940) 2,029,900,000 escudos; public debt (1939) 7,192,100,000 escudos; notes in circulation (May 31, 1941) 3,093,000,000 escudos; gold reserve (Dec. 31, 1939) 920,000,000 escudos; exchange rate (average 1940): 1 escudo=3.711 cents; (June 1941) 1 escudo=4.003 cents.

Trade and Communication.—External trade (merchandise): imports (1940) 2,523,500,000 escudos; exports 1,612,600,000 escudos. Communications and transport (Dec. 31, 1937): roads, first and second class 8,858 mi.; railways, open to traffic, 2,187 mi.; motor vehicles licensed (Dec. 31, 1937): cars 34,442; commercial 11,410; cycles 4,536; shipping (June 30, 1939) 269,000 gross tons.

Agriculture and Minerals.—Production 1939 (in metric tons): wheat 516,100; maize 364,700; wine 7,718,000 hectolitres; coal 308,000; rye 98,800; oats 91,100; rice (1938) 68,400; barley 39,200; potatoes 606,000; olive oil 33,400; sea fisheries (excluding cod fishing) 180,400. (*See* also PORTUGUESE COLONIAL EMPIRE.)

REFUGEES IN LISBON during 1941 had little to do except await their turn for coveted steamship and airline tickets to America. Every room in Lisbon and its suburbs was taken

Portuguese Colonial Empire.

Total area (approx.) 839,506 sq.mi.; total population (est. Dec. 31, 1938) 9,460,000, excluding Portugal, the Azores and Madeira. Certain essential statistics of the colonial possessions of Portugal (*q.v.*) are given in the table below.

History.—In 1941 interest centred chiefly round the Azores and Cape Verde islands. President Roosevelt having declared on May 27 that the United States would not permit the axis powers to occupy these islands, Portugal requested a clarification of this statement. Secretary of State Hull then handed the Portuguese minister a note expressing anxiety at the "expanding acts of ag-

Portuguese Colonial Empire

Colony & Area sq.mi. (approx.)	Population est. Dec. 31, 1938 (000's omitted)	Capital, Status, Governors, etc.	Principal Products (in metric tons)	Imports & Exports 1938 (in thousand escudos)	Road, Rail & Shipping 1937	Revenue and Expenditure est. 1939 (in thousand escudos)
AFRICA Angola (Portuguese West Africa) 481,351	3,260	Luanda, colony, *governor-general:* Manuel de Cunha e Costa Marques Mano.	(1938–39) maize 316,800 cane sugar 38,200	imp. 231,924 exp. 338,541	rds. 21,388 mi. rly. 1,434 mi. shpg. (1936) entered, 5,330,087 tons	rev. and exp. 255,990
Cape Verde Is. 1,546	170	Praia, colony, *governor:* Amadeu Gomeo de Figueiredo.	(export 1937) salt 29,843 preserved fish 325	imp. 107,090 exp. 117,754	rds. 493 mi. shpg. (1938) entered, 4,240,115 tons	rev. and exp. 19,452
Portuguese Guinea 13,946	420	Bolama, colony, *governor:* Luiz António de Carvalho Viegas.	(export 1938) ground-nuts 31,500; palm and palm kernel oil, 6,900	imp. 29,300 exp. 32,051	rds. 1,714 mi. shpg. (1936) cleared, 159,761 tons	rev. and exp. 30,395
São Tomé and Principe Is. 386	60	S. Tomé, colony, *governor:* Ricardo Vaz Monteiro.	cacao, coffee, coco-nut	imp. 18,823 exp. 34,576	rds. 169 mi. rly. 10 mi. shpg. entered, 868,539 tons	rev. and exp. 11,532
Mozambique (Portuguese East Africa) 297,729	4,300	Lourenço-Marques, colony, *governor-general:* General Tristão de Bettencourt	cane sugar (1936–37) 115,100; ground-nuts (export 1939) 32,200	(1937) imp. 432,769 exp. 365,257	rds. 17,970 mi. rly. 1,130 mi. shpg. (Beira) cleared, 4,148,118 tons	rev. and exp. 589,384
ASIA Portuguese India 1,538	600	Nova Gôa, colony, *governor-general:* José Cabral.	fish, spices, salt	(1936) imp. 111,543 exp. 20,508	rds. 730 mi.; rly. 51 mi.; shpg. entered, 2,378 vessels	rev. and exp. 61,606
Macao 8	170	Macao, colony, *governor:* Dr. A. T. Barbosa.	fish, cement, preserves	(1936) imp. 108,158 exp. 62,818	shpg. cleared, 2,208,285 tons	rev. and exp. 44,937
Timor 7,332	480	Dilly, colony, *governor:* Alváro Eugênio Neves de Fontoura.	coffee, sandalwood, wax	(1936) imp. 3,413 exp. 7,550	rds. 496 mi. shpg. entered, 100,729 tons	rev. and exp. 12,804

gression on the part of a certain belligerent power," and disclaimed for the United States any aggressive aims but reserved the right to take self-defensive action.

During the first half of 1941, and again in the late summer, large contingents of reinforcements were sent by Portugal to the Azores and from July 23 to Aug. 11 President Carmona was on an official visit there. A "colonial week," organized by the Portuguese Geographical society, was observed throughout Portugal at the end of May.

Following the concordat and the missionary agreement with the Vatican (May 1940), a missionary statute was promulgated which, besides implementing the agreement, made the recognition of missions dependent upon the colonial ministry and safeguarded the rights of the Portuguese language and jurisdiction. (E. A. P.)

Portuguese East Africa: *see* PORTUGUESE COLONIAL EMPIRE.
Portuguese Guinea: *see* PORTUGUESE COLONIAL EMPIRE.
Portuguese West Africa: *see* PORTUGUESE COLONIAL EMPIRE.

Post Office.

Revenues and expenditures for the fiscal year 1941 reached an all-time high in the postal history. From a previous high of $705,484,098 in 1930 the postal revenues decreased to a low of $586,783,165 in 1934. Beginning in 1935 there had been a yearly gain, and the fiscal year 1941 was the fifth consecutive year in which postal revenues reached record highs.

For the fiscal year 1941, the comptroller general stated the audited revenues as $812,827,735.71, an increase of 5.9% over 1940. The audited expenditures were $836,945,548.14, an increase of 3.6% over 1940. The postal deficit for 1941 was $24,117,812.43 as compared with $40,784,238.74 for 1940, or a reduction of 40.8%. The audited revenues shown represent cash earned during the fiscal year. However, the amount shown as audited expenditures includes $23,932,225.41 of items paid during the fiscal year 1941 which arose under obligations of prior fiscal years. Furthermore, audited expenditures do not reflect $26,778,094.63 of obligations incurred and chargeable against appropriations made for the fiscal year 1941, payments for which would be made during the fiscal year 1942. If expenditures were to be stated on an accrued basis the postal business for the fiscal year 1941 would be revenues $812,827,735.71 and total audited expenditures $839,791,417.36, which includes all obligations incurred and chargeable against appropriations for the fiscal year 1941. Therefore, the operating deficit for the fiscal year 1941 would be $26,963,681.65.

Other branches and other agencies of the government rely upon the postal establishment to perform numerous tasks in addition to carrying the mail for the public. Through the post offices there was sold, during the 1941 fiscal year, a total of 3,967,581 United States savings and defense savings bonds, having a maturity value of $981,768,250; internal revenue stamps valued at $4,828,545 and migratory bird hunting stamps valued at $1,373,080. In addition, the postal establishment was directed by statute to register and fingerprint more than 5,000,000 aliens for the department of justice. An unusual task accomplished by the co-operative efforts of all branches of the postal establishment during 1941 was the safe transportation of more than $9,000,000,000 in gold from New York, N.Y., to Fort Knox, Ky. This movement required 45 trains with a total of 337 cars. In co-operation with the civil service commission local civil service boards composed of post office personnel were set up in practically all first and second class post offices for the purpose of conducting examinations and making investigations. The public and the government have found it effective, economical and convenient to utilize the postal service facilities in carrying out these and similar activities, thereby enabling other agencies and branches of the government to perform governmental activities at a minimum of expense to the federal government.

Through its 44,095 post offices and 6,553 branches and classified contract stations the postal establishment was hired, during the fiscal year 1941, to transport and deliver approximately 28,000,000,000 pieces of mail, weighing some 3,000,000 tons, which was an increase of 250,500,000 pieces of mail and 45,142 tons over the fiscal year 1940. In the conduct of its work the postal establishment had 338,114 employees and accounted for over $8,000,000,000 in financial transactions. The expenditures for personnel for the postal establishment amounted to 75% of the total postal expenditures.

On June 30, 1941 there were 4,958 contract stations being conducted under two-year agreements. The average cost per unit was $317 and the total cost of operation amounted to $1,573,000, whereas the receipts from the sale of stamps at these contract stations amounted to $35,433,000.

City delivery service was established in 23 additional cities, thereby extending service to 24,456 blocks of territory serving 524,574 families and 26,411 new places of business.

Postmasters.—There were 1,630 postmasters confirmed by the U.S. senate and appointed, without term, by the president. Also, postmasters were commissioned at 2,890 offices of the fourth class where vacancies occurred for various reasons. There were 10,789 postmasters at offices of the first, second and third classes entitled to the benefits of the retirement act on June 30, 1941. Of this number 48 presidential and 419 fourth class postmasters were retired from the service.

Dead Letters.—Dead letters and dead parcel post packages were handled in a unit in Washington, D.C., and in an additional 14 dead parcel post branches and 1,192 dead letter branches in various cities. A total of 13,744,889 dead letters was received in the division, which was an increase of approximately 5%. Of this total, 2,432,000 letters were delivered to the senders and 11,247,000 were destroyed as undeliverable. Upon examination, 69,052 letters were found to contain money amounting to $94,058. The number of unclaimed parcels and articles found loose in the mails was 210,860.

Air Mail.—At the close of the fiscal year 1941 there were in operation 43,411 mi. of domestic air mail routes as compared with 37,943 mi. at the close of the previous fiscal year. A total of 74,297,154 mi. of service was performed as compared with 59,177,525 mi. of service in 1940. The total cost for the fiscal year 1941 was approximately $21,000,000 as compared with approximately $18,855,306 for the fiscal year 1940. Service was established on 13 new domestic routes serving an additional 53 cities with direct air mail supply.

Rural Delivery.—On June 30, 1941 a total of 1,411,753 mi. was travelled by rural carriers in providing service to approximately 29,000,000 patrons. The cost of the rural delivery service was $91,504,046 as compared with $91,447,713 for the fiscal year 1940. The extensions of this service to rural patrons resulted in an increase of 10,063 mi. of travel by the rural carriers during the fiscal year 1941

On Feb. 10, 1941 the first experimental highway postal service was established between Washington, D.C. and Harrisonburg, Va. This route is 146 mi. in length and serves 22 intermediate post offices. A second experimental route was established on May 3, 1941 between South Bend and Indianapolis, Ind., a distance of 152 mi.

Postal Savings.—The postal savings system on June 30, 1941, held the sum of $1,346,764,255 for 2,882,886 postal savings depositors. This was an increase of 66,478 depositors and $16,855,532 over the previous fiscal year.

On May 1, 1941 the treasury department launched a nation-wide defense bond and stamp program and requested the postal establishment to sell the defense series of savings stamps. The sales amounted to $6,086,925 during the period from May 1 to June 30, 1941. During the same period a total of 994,199 defense savings bonds were sold, having a maturity value of $121,977,050.

The sale of postage stamps through the philatelic agency amounted to $1,158,000, which was an increase of 5.2% over the previous fiscal year.

Buildings.—During the 1941 fiscal year 200 new additional government-owned post office buildings were placed in operation; 29 extensions to existing buildings were completed and occupied and 10 new federal buildings replaced a similar number of old buildings which had become inadequate for government purposes. A total of 179 new leases was made, including 162 for offices previously occupying space on a monthly rental basis. In renewing leases improvements were secured in the quarters especially in communities adjacent to large military establishments or in places where civilian activities had increased on account of the defense program. (H. F. A.)

Great Britain.—The 1941–42 budget estimate at £93,700,000 showed an increase of £12,000,000 over the estimate for the previous year, but this was more apparent than real, for in 1941 expenditure arising out of World War II, including the staff war bonus of £2,400,000, was included, whereas in 1940 this had been the subject of a separate vote of credit. The surplus for the year ended March 31, 1940 was down by £2,828,000, though the deficit on telegraph account was lower by £273,826 and the telephone surplus higher by £725,517, results attributable to the heavy demands for defense and rearmament purposes and the temporary suspension of reduced night rates for trunk phone calls. Increase of salaries and wages

(amounting in 1941 to some £7,000,000) and war bonus account largely for increased expenditure, but receipts showed a heavy decline, due partly to the increased charges and partly to the restriction of advertising circular distribution and the almost total elimination of football-pool business, and also because of the loss of poundage on postal orders during the time they were used as legal tender.

Despite the many, though trivial, criticisms levelled at the post office, this vast organization overcame the difficulties caused by the sudden transformation of Great Britain from a base to a battlefield. Several methods were successfully improvised to meet the situation arising after the destruction of offices and homes, mail bags and sorting offices during the raiding season; collections and deliveries were maintained even in the most bombed areas and were generally speeded up; and arrangements for the expeditious receipt of letters by prisoners of war were, through neutrals, successfully concluded with the enemy. Mails, naturally, tended to be erratic; some, mostly incoming, were lost by enemy action, but all that reached British ports were promptly delivered; outgoing mails were dispatched by every suitable ship, but they were usually obliged to follow devious routes and, as the war spread over Europe, more and more countries were barred to them. At the beginning of the year the staff numbered 267,000 (a rise in 12 months of 3,000), of which the proportion of women had greatly increased; and by June 1941, 52,000 of the regular employees were serving either in the armed forces or as civil defense workers, more than 5,000 of these being skilled sorters from the London area.

In February telegraphic service to the near east was speeded up by the adoption of a code system in which often recurring phrases could be signalled very briefly; in April a special 3*d*. air mail post card service was introduced for troops in the middle east; and shortly after came the "airgraph" letter service for the same theatre of war; the letters, written on a special form, being microphotographed and sent by aeroplane as part of a miniature film to be enlarged on arrival. By this means a load of letters normally weighing 1½ tons was compressed into under 20 lb. (*See* also PHILATELY.) (L. H. D.)

Potash. With the bulk of the world potash production in Germany, France, Russia, Poland and Spain, there was in 1941 naturally little information available concerning current conditions; about all that was known was that the French producing area reverted to Germany, the Polish to Russia, and that Spanish production again approached normal. The Palestine output was growing rapidly, and while no specific figures were made public, exports were expected to be of the order of 125,000 tons in 1940, or about double those of 1939. The only country in the entire production group on which definite figures can be given is the United States, where sales exceeded production in both 1939 and 1940. The 1940 output increased 20% over 1939, to 658,249 short tons, equivalent to 379,679 tons of K_2O, while sales increased 7% to 677,892 tons, equivalent to 393,058 tons of K_2O. Imports in 1940 totalled 258,061 long tons, equivalent to 117,656 tons of K_2O; while this is an increase of 20% over 1939, it is a drop of nearly two-thirds since 1937. In the same time exports increased, and were of the order of 100,000 tons of potash salts, mostly for fertilizer use. (*See* also FERTILIZERS.) (G. A. Ro.)

Potatoes. The 1941 crop of potatoes in the United States was reported by the department of agriculture on Nov. 10 as 376,701,000 bu. from 2,904,000 ac., compared with 397,722,000 bu. from 3,053,000 ac. in 1940 and a ten-year (1930–39) average of 370,045,000 bu. from 3,296,000 ac. The per-acre yield average was 129·7 bu. in 1941. In 1940 it was 130·3 bu.; the ten-year average was 112·6 bu. No figures were available in 1941 from the huge potato-producing areas of Germany and former Poland. Before the war, European production (excluding the U.S.S.R.) averaged 126,400,000 metric tons annually. In the United States the potato market began the year with its customary surplus and depressed prices; the per capita consumption of potatoes in the United States declined steadily after 1900. In Feb. 1941, the secretary of agriculture authorized a subsidy of 25 cents per cwt. on potatoes diverted to livestock feed, up to 12,500,000 bu. The government also subsidized the production of potato starch in Maine. Although large purchases of potatoes were made for army camps and the government bought canned potatoes for export under the lend-lease act, potato prices lagged until late summer, when speculators selected potatoes as a "sleeper"; that is, they decided that potato prices were behind the general advance of commodity prices. The activity of speculators in the futures market for potatoes (the Chicago Mercantile exchange) resulted in a sharp advance in prices during the autumn months. During 1941 there were persistent rumours that an increase in production of dehydrated potatoes for shipment to Great Britain might broaden the United States potato outlet. As pointed out, however, by the *Potato World*, monthly publication of the National Potato association, dehydrated potatoes were not widely used during World War I, and it was not practical to construct a sufficient number of dehydrating plants to affect consumption materially. In Sweden the government arranged for 15 alcohol distilleries to convert 11,000 short tons of potatoes into potato flakes to be used as a substitute for bread grains.

Table I.—*U.S. Production of Potatoes by States, 1941 and 1940*

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
18 surplus late potato states			Vermont	2,059,000	2,142,000
			New Hampshire	1,472,000	1,634,000
Maine	45,360,000	44,055,000	Rhode Island	814,000	878,000
Idaho	28,560,000	32,860,000	New Mexico	432,000	480,000
New York	28,078,000	26,838,000	Arizona	302,000	276,000
Pennsylvania	23,674,000	24,570,000	*7 intermediate potato states*		
Michigan	20,600,000	20,640,000			
Minnesota	17,082,000	23,750,000	New Jersey	9,700,000	10,150,000
Wisconsin	16,608,000	15,054,000	Virginia	7,007,000	10,412,000
North Dakota	15,010,000	18,920,000	Missouri	5,995,000	5,616,000
Colorado	12,775,000	15,210,000	Kentucky	3,760,000	4,140,000
California	11,470,000	12,480,000	Kansas	2,860,000	2,548,000
Nebraska	9,490,000	11,340,000	Maryland	2,342,000	2,898,000
Washington	8,600,000	8,325,000	Delaware	323,000	443,000
Oregon	8,460,000	8,510,000	*12 early potato states*		
Wyoming	2,185,000	2,400,000			
South Dakota	2,015,000	2,016,000	California	10,335,000	10,260,000
Utah	1,836,000	2,040,000	N. Carolina	6,723,000	8,720,000
Montana	1,840,000	2,040,000	Texas	6,076,000	3,200,000
Nevada	330,000	391,000	Alabama	5,400,000	4,176,000
12 other late potato states			Florida	3,306,000	4,312,000
			Arkansas	3,139,000	3,895,000
Ohio	13,000,000	11,800,000	Tennessee	2,745,000	3,388,000
Iowa	6,099,000	6,120,000	S. Carolina	2,730,000	3,192,000
Indiana	4,324,000	4,335,000	Louisiana	2,684,000	2,280,000
W. Virginia	3,960,000	3,630,000	Oklahoma	2,170,000	2,550,000
Connecticut	3,402,000	3,402,000	Mississippi	1,365,000	1,240,000
Illinois	3,312,000	3,549,000	Georgia	1,140,000	1,482,000
Massachusetts	2,726,000	3,135,000			

Sweet Potatoes.—Production of sweet potatoes in the United States in 1941 was estimated by the department of agriculture, Nov. 10, as 70,844,000 bu. from 843,000 ac.; average yield per acre, 84 bu. In 1940 it was 61,998,000 bu. from 772,000 ac.; the per-acre yield, 80·3 bu. The ten-year (1930–39) average was 73,208,000 bu. from 882,000 ac., or 83 bu. per acre.

Table II.—*U.S. Sweet Potato Production by Leading States, 1941 and 1940*

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Alabama	7,840,000	4,920,000	Louisiana	6,138,000	4,088,000
Georgia	7,194,000	6,930,000	Texas	5,580,000	4,335,000
North Carolina	6,960,000	7,104,000	South Carolina	5,525,000	5,040,000
Mississippi	6,035,000	4,485,000	Tennessee	5,192,000	4,335,000

(S. O. R.)

Poultry. Commercial hatcheries in the United States produced 1,052,460,000 baby chicks in 1941, 28% more than the output of 1940 and 17% above the previous record year of 1930, the department of agriculture reported. During the first six months of 1941, the number of laying hens on U.S. farms was slightly less than in 1940, but during the second six months, in response to the government's request for increased production, farm flocks were steadily increased until December. They averaged 341,256,000 layers throughout the latter month, an increase of 7% over Dec. 1940. All except one state showed an increase in farm flocks at the end of the year, with prospects for still larger numbers of layers in 1942. The holdings of young chicks at the beginning of 1942 were the largest in the seven years of record; they were 12% larger than at the beginning of 1941 and 11% higher than the five-year (1936–40) average. Of these holdings, 68% were laying pullets, 17% were pullets under laying

age and 15% were cockerels. The rate of lay in Dec. 1941 was the highest on record for that month; on Jan. 1, 1942, the rate was 9% above that of Jan. 1, 1941. (*See* also EGGS.)

Receipts of dressed poultry (fresh and frozen) at the four principal United States markets in the first ten months of 1941 were about the same as in the same period of 1940, but in the last two months the 1941 receipts increased greatly. By December the current consumption of chicken meat in the United States had broken all previous records. Older layers were held back on the farms longer than usual to increase the egg output, as requested by the government. The marketing of these older hens, fed to heavier weights, plus the increased autumn operations of hatcheries to augment broiler and fryer production, resulted in record cold-storage holdings of poultry Jan. 1, 1942—218,374,000 lb. compared with 208,365,000 lb. Jan. 1, 1941, and a five-year (1937–41) average for that date of 165,300,000 lb. Prices received by farmers for chickens ran about 18% higher through most of 1941, as compared with 1940.

U. S. Stocks of Frozen Poultry Jan. 1, 1942 and 1941 and 1937-41

	1942 (lb.)	1941 (lb.)	5-yr. (1937–41) av. (lb.)
Broilers	14,048,000	11,170,000	14,245,000
Fryers	18,186,000	14,327,000	14,636,000
Roasters	45,582,000	35,118,000	33,173,000
Fowls	44,269,000	41,461,000	30,012,000
Turkeys	49,956,000	60,626,000	39,277,000
Ducks	6,876,000	7,992,000	6,169,000
Miscellaneous frozen poultry	21,412,000	20,819,000	27,788,000
Unclassified frozen poultry	18,045,000	16,852,000	*

*Reported as miscellaneous poultry previous to Jan. 1, 1940.

(S. O. R.)

Power, Sir D'Arcy (1855–1941), British surgeon and medical scholar, was born Nov. 11 in London. A prolific writer on medical subjects, Sir D'Arcy was an authority on William Harvey, discoverer of the circulation of the blood, and John Hunter, famed British surgeon. He also wrote extensively on war surgery, syphilis, cancer, intestinal obstruction and diseases of children. Sir D'Arcy was a visiting lecturer at Johns Hopkins university in 1930–31; a consulting surgeon and archivist at St. Bartholomew's hospital, London; Hunterian trustee of the Royal College of Surgeons of England and honorary fellow of both the Royal Society of Medicine and the American Surgical association. Among his works are *Selected Writings* (1931) and *A Mirror for Surgeons* (1940). Sir D'Arcy died at his home in Northwood, Middlesex, May 18.

Pownall, Sir Henry Royds (1887–), British army officer, was born July 29 in Blackheath, England. He was educated at Rugby and the Woolwich Royal Military academy and served in the royal field artillery in England and India, 1906–14. He won the distinguished service order and the military cross for his services during World War I as an artillery officer. He participated in operations on the northwest frontier of India, 1930–31, commanded the school of artillery, Larkhill, England, 1936–38, was a director of military operations and intelligence in the war office, 1938–40, and became chief of the general staff of the British expeditionary force in 1940. Later, as inspector general of the home guard, he swiftly reorganized and armed British home units to forestall the possible German invasion which threatened after Dunkirk. He was named temporary lieutenant general in 1940 and was also made vice-chief of the imperial general staff, May 1941. On Dec. 27, 1941, Pownall was designated commander of British forces in the far east, to succeed Sir Robert Brooke-Popham (*q.v.*). His immediate task was to check the Japanese invasion of Malaya, which threatened to engulf the Singapore naval base, and to co-ordinate British military activity in the Pacific with that of her allies.

Prajadhipok (1893–1941), prince of Sukhodaya and king of Siam, seventh monarch of the Chakri dynasty, was born Nov. 8 to the title Prince of Sukhodaya, at Bangkok. He was the third son of King Chulalongkorn and Queen Sowabha Pongsi. His schooling was planned by his parents to include military training at Bangkok, a general education at Eton and later a course for young British officers at Woolwich. In 1918 he married Rambai Barni, a royal princess. Upon the death of his second brother, King Rama VI, he succeeded to the throne, Nov. 26, 1925. In 1931 the young monarch went to the U.S. to undergo an eye operation. When Prajadhipok was in England later, undergoing medical treatment for cataracts, the Siamese parliament wrested from him his last royal prerogatives and he was forced to abdicate March 2, 1935, in favour of his 10-year-old nephew Ananda Mahidol. But the exiled monarch had insured himself against the loss of his throne with British and French insurance underwriters and derived a substantial income from this investment. He died at his country home, Virginia Water, Surrey, May 31.

Presbyterian Church. The Reformed churches holding the Presbyterian system, within the United States of America, are 12 in number and included, in 1941, 18,354 ministers, 18,639 churches and 3,864,681 communicant members with approximately 7,500,000 adherents. Outside of continental United States they had 2,179 American foreign missionaries and 13,813 native workers in a total of 21 countries with a communicant membership of 237,652.

In order to meet the extraordinary problems emerging from the war, all of the churches of the Presbyterian family united in raising funds for numerous crisis-born causes. Among these causes, totalling many hundreds of thousands of dollars, were orphaned missions in foreign lands where income from Europe had been cut off by the war, war emergency needs of boards of foreign missions, Christian refugees from totalitarian tyranny, Bible distribution, China civilian-relief, spiritual care of American soldiers and sailors and special religious needs in national defense industrial areas. A noteworthy effort was the completion of a $10,000,000 Sesquicentennial fund for Christian education by the Presbyterian Church in the United States of America, the total sum raised being $10,279,855.

The General assembly of the Presbyterian Church in the United States of America, in the matter of church co-operation and union, directed its three boards of foreign missions, national missions and Christian education to appoint committees to confer with similar committees of the Presbyterian Church in the United States (Southern), regarding means to co-ordinate all the missionary and educational work of the two churches, hoping that "such a procedure would lead to a form of organic union which would be acceptable to both"; urged its members to "forward the process of union" with the Protestant Episcopal Church; and approved the continuance of union negotiations with these two churches during the year. By a vote of 154 to 101 the Southern Presbyterian Church voted to rejoin the Federal Council of Churches of Christ in America, from which it had withdrawn in 1932. All churches renewed their endorsement of the World Council of Churches.

The western section of the World Presbyterian alliance, representing the Presbyterian and Reformed Churches in the United States and Canada, with delegates from Great Britain and the far east, held its annual meeting in Baltimore, Md., Feb. 1941.

Europe.—All reports from the Reformed Churches in Europe revealed the fact that the ecumenical church remained alive even if in practice it was stopped by the impossibility of correspondence. The Swiss churches alone were able to demonstrate it

by aid to prisoners of war, refugees and suffering churches.

In Great Britain more than 500 Presbyterian church buildings were either wholly destroyed or badly damaged by enemy action. All the meetings of the Supreme Judicatories in Scotland, England, Wales and Ireland were held in spite of the difficulties and inconveniences incident to war.

The Reformed Church in France made every effort to maintain its unity among the three zones into which it had been divided by the war: the occupied, the unoccupied and the prisoners' camps in Germany. At the annual meeting of the National Synod in August, all zones were represented. The Reformed churches of Holland and Belgium, although feeling in growing measure the pressure from a foreign regime, were experiencing a real unification of their church life. The Reformed churches in eastern Europe, particularly in Poland, Lithuania and the Ukraine, were practically ended as organized bodies. Authentic information indicated that in Germany the Reformed Church was in open or silent opposition to naziism. The Church of the Czech Brethren in Bohemia was a silent church trying to continue its work as quietly as possible. The two chief bodies of the Hungarian Reformed Church met in May, representatives of the reattached areas being able to take part for the first time in 23 years.

The 650th anniversary of the Swiss confederation was celebrated by the Swiss Christian Youth organizations at large youth gatherings in various parts of that country. (W. B. Pu.)

Presidents, Sovereigns and Rulers

The following list includes the names of those holding chief positions in their countries at the beginning of 1942.

Country	*Name and Office*	*Accession*
Afghanistan	Muhammad Zahir Shah, King	1933
Arabia, Saudi	Abdul Aziz ibn Sa'ud, King	1926
Argentina	Ramón S. Castillo, Acting President	1940
Australia	Alexander Gore Arkwright, Baron Gowrie, Governor General	1936
	John Curtin, Premier	
Belgium	Leopold III, King (German occupation)	1934
Bhutan	Yigme Wangchuk, Maharaja	1926
Bohemia-Moravia	Dr. Emil Hácha, President (German protectorate)	1939
Bolivia	General Enrique Peñaranda del Castillo, President	1940
Brazil	Dr. Getulio Vargas, President	1931
Bulgaria	Boris III, King	1918
	Bogdan Piloff, Prime Minister	
Burma	Sir Reginald Hugh Dorman-Smith, Governor	1941
Canada	Earl of Athlone, Governor General	1940
	W. Mackenzie King, Prime Minister	
Chile	Gerónimo Mendez Arancibia, Acting Vice-President	1941
China	Lin Sen, Chairman of National Gov't	1932
	Gen. Chiang Kai-shek, President of Executive Yuan	1939
Colombia	Dr. Eduardo Santos, President	1938
Costa Rica	Rafael A. Calderon Guardia, President	1940
Cuba	Col. Fulgencio Batista y Zaldivar, President	1940
Czechoslovakia	Dr. Eduard Beneš, President (German occupation)	1940
Denmark	Christian X, King (German occupation)	1912
Dominican Rep.	Manuel de Jesus T. de la Concha, President	1940
Ecuador	Carlos Arroyo del Rio, President	1940
Egypt	Farouk I, King	1936
Eire	Dr. Douglas Hyde, President	1938
	Eamon de Valera, Premier	1930
Ethiopia	Haile Selassie I, Emperor	1930
Finland	Risto Ryti, President	1940
France	Henri Philippe Pétain, Chief of State, Marshal of France	1940
Germany	Adolf Hitler, Fuehrer and Reich Chancellor	1933
Great Britain	George VI, King and Emperor	1936
	Winston Churchill, Prime Minister	
Greece	George II, King (German occupation)	1935
Guatemala	Gen. Jorge Ubico, President	1931
Haiti	Elie Lescot, President	1941
Honduras	Gen. Tiburcio Carías Andino, President	1933
Hungary	Admiral Nicholas Horthy, Regent	1920
	László de Bárdossy, Premier	
Iceland	Sweinn Björnsson, Regent (U.S. Protection)	1941
India	Marquess of Linlithgow, Viceroy, Governor General	1936
Iran	Mohammed Reza Pahlevi, Shahinshah	1941
Iraq	Feisal II, King (Regency)	1939
Italy	Victor Emmanuel III, King	1900
	Benito Mussolini, Premier, Chief of Gov't, Sec'y of State	
Japan	Hirohito, Emperor	1926
	Gen. Hideki Tojo, Premier	
Lebanon	Alfred Naccache, President	1941
Liberia	Edwin Barclay, President	1932
Liechtenstein	Franz Joseph II, Sovereign Prince	1938
Luxembourg	Charlotte, Grand Duchess (German occupation)	1919
"Manchoukuo"	Henry Pu Yi ("Emperor Kangte")	1934
Mexico	Manuel Avila Camacho, President	1940
Monaco	Louis II, Prince	1922
Morocco	Sidi Maulay Mohammed, Sultan	1927
Nepal	Maharaja Sir Joodha Shumshere Jung Bahadur Rana, Prime Minister and Supreme Commander in Chief	1932
Netherlands	Wilhelmina, Queen (German occupation)	1890
Newfoundland	Sir Humphrey T. Walwyn, Governor	1936
New Zealand	Sir Cyril Newall, Governor General	1941
	Peter Fraser, Prime Minister	
Nicaragua	Gen. Anastasio Somoza, President	1937
Norway	Haakon VII, King (German occupation)	1905
Oman	Sir Sayyid Said bin Taimur, Sultan	1932
Palestine	Sir Harold Alfred MacMichael, High Commissioner	1938
Panama	Ricardo Adolfo de la Guardia, President	1941
Paraguay	Higinio Morínigo, Provisional President	1940
Peru	Manuel Prado y Ugarteche, President	1939
Philippines	Manuel Luis Quezon, President	1935
	Francis B. Sayre, U.S. High Commissioner	1939
Poland	Wladislaw Rac.kiewicz, President (German occupation)	1939
Portugal	Gen. António Oscar de Fragoso Carmona, President	1926
	Dr. António de Oliveira Salazar, Premier	
Rumania	Mihai, King	1940
	Ion Antonescu, Premier-Dictator	
Salvador, El	Gen. Maximiliano Hernández Martínez, President	1931
"Slovakia"	Joseph Tiso, "President"	1939
South Africa	Sir Patrick Duncan, Governor General	1937
	Gen. Jan C. Smuts, Premier	
Spain	Gen. Francisco Franco Bahamonde, Chief of State, Prime Minister	1936
Sudan	Lt. Gen. H. J. Huddleston, Governor General	1940
Sweden	Gustaf V, King	1907
Switzerland	Dr. Philippe Etter, President	1942
Syria	Taj-ed-Dine-el-Hassani, President	1941
Thailand	Ananda Mahidol, King (Regency)	1935
Trans-Jordan	Abdullah ibn Hussein, Emir	1928
Tunisia	Sidi Ahmed II, Bey	1929
Turkey	Ismet Inonu, President	1938
U.S.S.R.	Mikhail Ivanovich Kalinin, President	1936
	Joseph V. Stalin, Premier and Communist Secretary	
United States	Franklin D. Roosevelt, President	1933
Uruguay	Gen. Alfredo Baldomir, President	1938
Vatican City	Pius XII, Pope	1939
Venezuela	Gen. Isaias Medina Angarita, President	1941
Yugoslavia	Peter II, King (German occupation)	1941
Zanzibar	Seyyid Sir Khalifa bin Harub, Sultan	1911
	Sir Henry Guy Pilling, British Resident	1940

Prévost, Eugène Marcel (1862–1941), French novelist, was born May 1 in Paris. He had his first story published when he was 19. His early novels were in the romantic vein, but his fame rests more securely on the series of novels probing the social and moral problems of his time, the most famous of which is *Les Demi-vierges*. He was elected to the French academy in 1909 and at the time of his death he was directing publication of the *Revue de France*, a monthly he had founded in 1921. Among his later works are *L'Homme vierge* (1930); *Voici ton maître* (1931); *Marie des Angoisses* (1932); *Febronie* (1933) and *Clarisse et sa fille* (1934). He died at his estate in Vienne in southern France, April 8. See *Encyclopædia Britannica*.

Price Administration, Office of. The Office of Price Administration (formerly called the Office of Price Administration and Civilian Supply) was created by executive order of the president issued April 11, 1941. The agency combined into one organization the activities formerly carried out by the commissioners in charge respectively of price stabilization and consumer protection in the advisory commission to the Council of National Defense. This commission had been created in May 1940 to direct the armament program of the United States.

The Office of Price Administration was charged in the executive order creating the agency with the task of taking "all lawful steps necessary or appropriate in order to prevent price spiralling, rising costs of living, profiteering and inflation resulting from

market conditions caused by the diversion of large segments of the nation's resources to the defense program, by interruptions to normal sources of supply, or by other influences growing out of the emergency." In addition the OPA was given responsibility, through the consumer division, for seeing that the standard of living was maintained on the highest possible level consistent with military defense requirements.

The Office of Price Administration was headed in 1941 by an administrator appointed by the president. Under the administrator, Leon Henderson (*q.v.*), is a deputy administrator (John E. Hamm in 1941). Under the latter is the director of the price division (J. K. Galbraith in 1941), a deputy director in charge of the consumer division (Harriet Elliott in 1941) and the general counsel (C. David Ginsburg). The price division was composed of 14 commodity sections, each headed by a price executive in charge of price work for the commodities in his section, a research division, and a division of accounting, analysis and review. The commodity sections included the following: consumers' durable goods; industrial and agricultural machinery; copper and brass; chemicals, drugs and paints; rubber and rubber products; paper and paper products; automobiles and trucks; textiles, leather goods and apparel; food and food products; fuel; lumber and building materials; zinc, lead and tin; and steel, iron, and steel products. There was also a section which handled rent problems. The consumer division operated through three separate sections dealing respectively with consumer relations, consumer standards and needs and consumer publications.

Price actions by OPA fell into the following general classifications: warnings concerning unjustified price increases; informal agreements with individual concerns regarding prices they charge for their products; letters to individual concerns asking them not to charge prices higher than those prevailing on specified dates; and formal price schedules establishing maximums which may be charged for commodities covered in the schedule. It was the practice of the agency to hold frequent conferences with representatives of companies whose prices were under consideration, and in a number of cases in 1941 industry panels were created composed of representatives from various concerns in the industry to meet with OPA officials to give advice in working out details of price schedules or other proposed action.

There were 60 price schedules issued as of Dec. 23, 1941, of which two were revoked. They covered the following commodities:

1. Second-hand machine tools
2. Aluminum scrap and secondary ingot
3. Zinc scrap materials and secondary slab zinc
4. Iron and steel scrap
5. Bituminous coal (revoked)
6. Iron and steel products
7. Combed cotton yarns
8. Nickel scrap and secondary materials
9. Hides, kips and calfskins
10. Pig iron
11. Cotton gray goods
12. Brass mill scrap
13. Douglas fir peeler logs and Douglas fir plywood
14. Raw silk and silk waste
15. Copper
16. Sugar
17. Pig tin
18. Burlap
19. Southern pine lumber
20. Copper scrap
21. Formaldehyde
22. Pennsylvania grade crude oil
23. Rayon gray goods
24. Washed cattle tail hair and winter hog hair
25. Fats and oils and their products
26. Douglas lumber
27. Anthracite (revoked)
28. Ethyl alcohol
29. Coke
30. Wastepaper sold east of the Rocky mountains
31. Acetic acid
32. Paperboard sold east of the Rocky mountains
33. Carded cotton yarn
34. Wood alcohol—methanol
35. Carded gray and coloured yarn cotton goods
36. Acetone
37. Normal butyl alcohol
38. Glycerine
39. Upholstery furniture fabrics
40. Builders' hardware and insect screen cloth
41. Steel castings
42. Paraffin wax
43. Used steel barrels or drums
44. Douglas fir doors
45. Asphalt or tarred roofing products
46. Relaying rail
47. Old rags
48. Flashlights, flashlight batteries and flashlight bulbs
49. Resale of iron or steel products
50. Green coffee
51. Cocoa beans and cocoa butter
52. Pepper
53. Fats and oils
54. Douglas fir peeler logs
55. Second-hand bags
56. Reclaimed rubber
57. Wool floor coverings
58. Wool and wool tops and yarns
59. Kapok
60. Direct consumption sugars

Following is a brief outline of the steps taken in preparing a price schedule:

(1) A factual background is built up regarding any price problem by research workers in conjunction with technical consultants, business advisers and other government agencies;

(2) A representative panel of industry members are invited to Washington to discuss the price problem under study;

(3) An appropriate plan of action is formulated, taking into account the following principal objectives: the prevention of inflationary price movements, the encouragement of an adequate supply of vital materials, the maximum use of existing trade practices, and the least possible disturbance to the existing structure and operations of an industry.

Completion of this preparatory work is followed by preparation of an economic brief outlining in detail the economic aspects of the problem and the reasons for recommending a particular line of action.

A legal brief is also prepared which discusses in detail the legal problems inherent in the proposed price schedule. These economic and legal briefs, together with the schedule recommended by staff members, are carefully reviewed by the responsible department heads before submission to the administrator for his approval and signature. (L. Hn.)

Two orders issued by the OPA after the outbreak of war with Japan had immediate and drastic effect upon U.S. consumers. The sale of new automobile tires was stopped in December, and rationing of all rubber products began Jan. 4, 1942. Civilian consumption of rubber was cut by an estimated 80% under the rationing plan. On Jan. 2, 1942 the OPA announced that all production of automobiles in the United States would stop after Jan. 31. Sales of new cars were prohibited after Jan. 1. (*See* also Canada: *War Price and Wage Control;* Defense, National [U.S.]; Leather; Municipal Government; Priorities; Supply Priorities and Allocations Board.)

Prices. Prices of commodities in the leading markets of the world were dominated during 1941 by the economic effects of wars and preparation for wars on all the continents. Early in the year, following sharp advances in 1940, prices were relatively stable. This reflected chiefly an extension of governmental controls affecting prices, continued curtailment of the European market, relatively large crops and supplies of industrial raw materials available to markets outside the continent of Europe, and a temporary improvement in the shipping situation.

Beginning in March, however, with the passage of lend-lease

"IT'S AN ILL WIND THAT BLOWS NOBODY SOME GOOD," commented Lewis of the *Milwaukee Journal* in surveying the rapid rise of U.S. farm prices in 1941 under the national defense and lend-lease programs

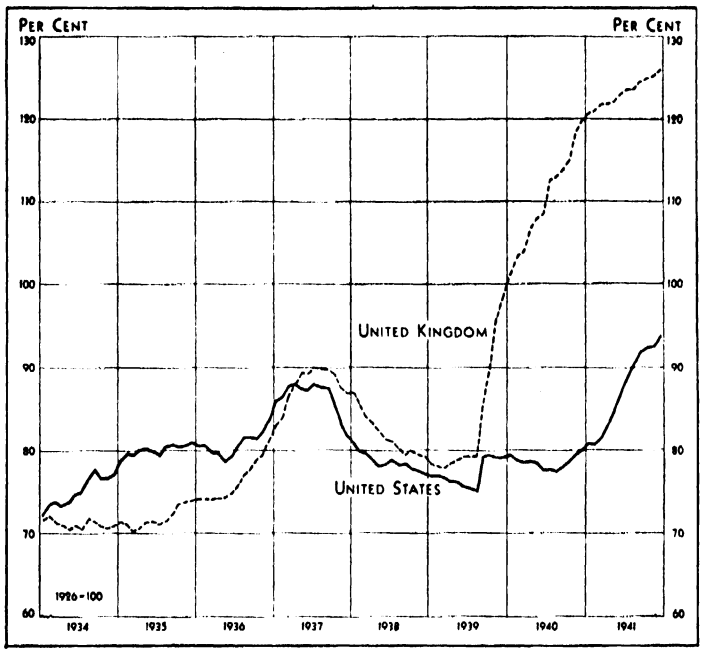

Fig. 1.—WHOLESALE PRICES IN THE UNITED KINGDOM AND THE UNITED STATES, 1934–41 (Source: United Kingdom—Board of Trade, converted to 1926 base; United States—Bureau of Labor Statistics); December 1941 estimated. War conditions in the United Kingdom made many price quotations nominal; undoubtedly the index for that country understates the price rise after August 1939

legislation, the military program of the United States was greatly expanded and the resulting vast new demands led to widespread price advances in the United States and also in Canada, Argentina and the far east, which supply raw materials. Canada adopted a general ceiling over prices of goods and services in November. In France, Switzerland and Japan, which were completely or in large part cut off from their usual sources of supply, prices continued to advance throughout the year. In the United Kingdom and Germany, domestic resources were less limited and governmental controls were greater so that price increases were more effectively restrained despite restricted imports and extensive military activities.

In the United States, governmental controls affecting prices were extended considerably during 1941 and during the autumn months price increases were generally small; in December, however, when hostilities broke out with Japan, Germany and Italy, prices in the United States and related countries showed further substantial increases.

The cost of living rose considerably in most countries throughout the year and a growing number of commodities became unavailable at any price.

United States.—Wholesale commodity prices in the United States showed a rapid advance from 81% of the 1926 average in Feb. 1941 to 92% in the early part of September and then were relatively stable for three months, as shown in fig. 1. With United States' entry into World War II in December, wholesale prices rose further to a level 25% above that of Aug. 1939, before the beginning of the war in Europe. This is indicated in the table, which also shows the widespread nature of the advance. Retail prices, illustrated in fig. 2, began a sharp rise early in 1941, reflecting chiefly advances in wholesale prices; by the end of the year the total cost of living was 10% higher than in March. Retail prices of foods and textile products showed the largest increases. In December, retail foods were about 17% higher than in March and 23% above Aug. 1939.

The rise in wholesale prices beginning in February was initiated by advances in imported commodities accompanying the prospect of increased shipping difficulties. In March, price advances extended to domestic commodities, reflecting chiefly anticipation of important changes in the underlying situation as a result of the rapidly expanding defense program. Before that time, the program was of limited character involving armament expenditures of $17,000,000,000 over several years. With authorization of lend-lease aid and further additions to the military program, it became evident that expenditures for armaments and facilities to produce them would be vastly expanded and that government purchases of both industrial and agricultural commodities would be in great volume. Moreover, it became apparent that expenditures would become more urgent and have important direct effects in commodity markets as well as indirect effects in increasing consumer incomes, restricting supplies of consumers' goods and raising costs of production and distribution.

Wholesale prices had already risen considerably in the autumn of 1940 and the prospect of these new developments brought unprecedented buying by manufacturers, distributors and consumers during the spring and summer. The volume of buying was reduced somewhat in the autumn as inventories and commitments accumulated and federal restrictions on purchasing of materials and output of finished products were extended; in December, however, buying and prices increased once more. Factors restricting market supplies and consequently increasing the pressure on prices during the year included the withholding of stocks on the part of private concerns and public agencies; shifts or reductions in coastwise and foreign shipping facilities; concentration of large federal contracts with relatively few producers; and reluctance at the start of the defense program in 1940 to expand plant facilities.

Production of both agricultural and industrial commodities—particularly the latter—was larger in 1941 than in 1940 but output was not great enough to meet the rising demands from the government and from civilian consumers. Income payments to individuals at the end of the year were about 30% higher than in the summer of 1940 when the defense program was inaugurated. This rise was an important element contributing to the advance in prices. An important part of the rise in payments reflected increases in wages and salaries reflecting chiefly additional employment and increased hours of work. As demand for workers increased, wage rate advances became widespread, and the pressure for higher rates was stimulated by the sharp rise in living costs and by a further substantial increase in corporate profits after allowance for increased taxes. During 1941 measures for limiting civilian demand were put into effect—particularly higher taxes, sale of defense bonds to the public and regulation of consumer credit. Also, by the end of the year there were important instances of the curtailment of incomes and consequently of demand for goods because of dislocations arising from the transition to armament production and the reduction of activity in industries using certain imported materials. But the underlying situation with regard to increasing expenditures and reduced supplies indicated a continued upward movement in prices unless more drastic direct federal action was taken.

Federal measures were adopted early in 1941 to limit advances in metal prices, including those from secondary sources and scrap, and, as shown in the table, prices of metals showed the smallest rise during the year of any major group. During the summer selective price controls affecting mainly industrial raw materials were extended further. Also, official concern was expressed regarding the danger of inflationary developments and emergency price legislation was introduced in congress, but passage was

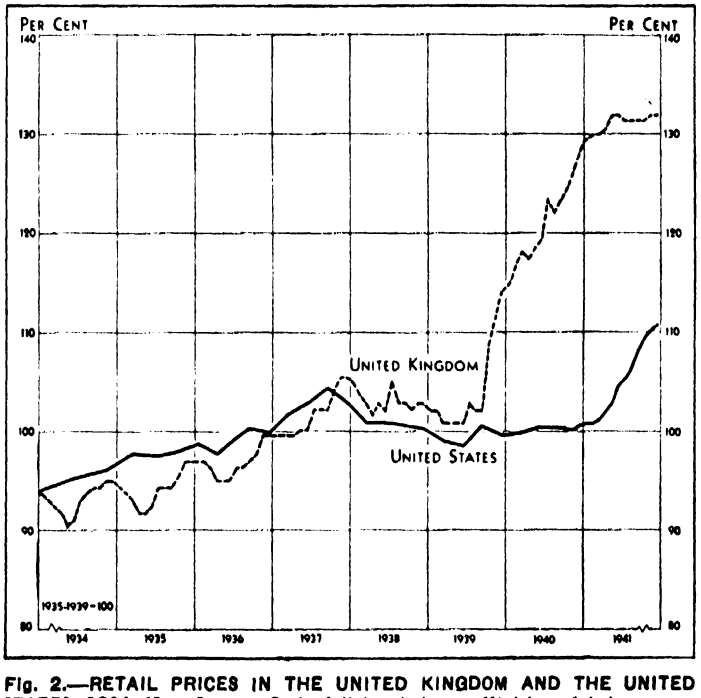

Fig. 2.—RETAIL PRICES IN THE UNITED KINGDOM AND THE UNITED STATES, 1934–41. (Source: Cost of living indexes. Ministry of Labour, converted to 1935–39 base, first-of-month data; Bureau of Labor Statistics, mid-month data, selected dates before Sept. 1940.) Dec. 1941 estimated. Because of the war, price quotations for the United Kingdom, 1939–41, are only nominal and are probably understated

Wholesale Prices in the United States

	Index numbers, 1926=100		Per cent rise to Dec. 27, 1941, from	
	Jan. 4, 1941	Dec. 27, 1941	Jan. 4, 1941	Aug. 26, 1939
All commodities	80.2	93.8	17	25
Farm products	71.2	95.5	34	56
Foods	73.2	91.2	25	37
Other commodities	84.4	93.9	11	17
Hides and leather products	102.5	115.6	13	25
Textile products	74.3	91.5	23	36
Fuel and lighting materials	72.6	79.0	9	8
Metals and metal products	97.8	103.4	6	11
Building materials	99.4	108.1	9	21
Chemicals and allied products	78.0	91.7	18	24
House-furnishing goods	90.2	102.3	13	18
Miscellaneous commodities	77.1	87.4	13	20
Raw materials	74.2	92.5	25	40
Manufactured products	83.2	95.2	14	20

Source of data: Bureau of labor statistics.

not secured by the end of the year. Generally, prices of commodities not subject to federal maximums continued to advance sharply, and some maximum prices were also raised. By the end of December, about 65 maximum price schedules had been issued for a wide variety of goods; federal representations and warnings had been made regarding numerous other commodities; and in some instances informal requests had been made or agreements arranged to maintain existing prices.

Prices of farm products, which were largely excluded from maximum price action, rose by one-third during the year reflecting increased consumer and speculative demand, higher rates on federal loans to producers withholding crops from market, and federal support of prices of a number of livestock and vegetable products by open-market purchases for domestic relief and foreign aid. The sharp price advances for farm products, which are the chief raw materials for food and textile products, were an important factor in the rise in the cost of living in 1941.

United Kingdom.—Prices of commodities in both wholesale and retail markets in the United Kingdom generally showed small increases during 1941, according to published indexes. This was in contrast to the rapid and widespread advances which had begun with the outbreak of World War II in Sept. 1939 and continued in 1940 (see figs. 1 and 2). The price increases earlier had occurred, despite governmental attempts to control the distribution and prices of many commodities, largely because of rises in prices of imported materials and foodstuffs, increases in production and fabrication costs and speculative demands. After the spring of 1940 the effects of war effort were more fully felt and the pressure on prices was intensified. Domestic output and imports of civilian goods were more drastically reduced; there were dislocations accompanying the shift of productive facilities to armament products; and supplies and equipment were destroyed by military action. On the other hand, demand continued to increase as the result of large-scale national expenditures for military products and other activities associated with the war effort. These expenditures added to the demand for commodities both directly in purchases by the government and indirectly by increasing consumer incomes as a result of greater employment, increased wage rates and overtime payments. By the middle of 1941, however, the operation of the United States lend-lease program began to supply quantities of armaments and foodstuffs without payment of gold or dollar resources of the United Kingdom. Also these supplies, in the United Kingdom and in other areas of the empire, reduced the national expenditures required and thus relieved pressure on domestic prices.

Various governmental price arrangements undertaken early in the war were extended further in 1941. The program for bulk purchases of empire and dominion products such as wheat, cocoa, wool and nonferrous metals was continued. Rationing of many basic foods to individual consumers and control of retail food prices and margins were widened. Also, increased government subsidy payments were required to limit retail prices of major foods. Control of prices of other essential consumers' goods under the Prices and Goods act of 1939 had only limited success, partly because supplies available to the public were sharply curtailed further in 1941. In June the Goods and Services act was passed, conferring on the board of trade power to fix maximum prices of both goods and services and to control stocks of goods and multiple transactions. The first order issued under this act was on "essential clothing," which covered conditions of production and distribution, and maximum prices. A system of rationing clothing and footwear had been instituted earlier with coupons required for articles purchased from retailers.

The various control regulations were not fully effective, however, and concern was expressed regarding the growth in illicit trading, particularly for foods. These and other developments make price movements and the importance of price movements uncertain in the United Kingdom. (*See* also AGRICULTURE: *Foreign Trade and Agriculture;* BUSINESS REVIEW: *Commodity Prices;* CANADA: *War Price and Wage Control;* COTTON; COST OF LIVING; PRICE ADMINISTRATION, OFFICE OF; and articles on individual commodities.) (C. GN.)

Prien, Guenther (1908?–1941), German U-boat commander, was one of the most popular and renowned of Germany's war heroes. On Oct. 14, 1939, Prien guided his submarine through the British defenses at Scapa Flow and sank the British battleship "Royal Oak" while she was riding at anchor in the harbour. For this daring feat he was honoured by Adolf Hitler and even won the acclaim of Winston Churchill, then first lord of the admiralty, for his "remarkable exploit." He was credited with sinking 235,941 tons of allied shipping. The "Arandora Star," carrying axis prisoners to Canada in July 1940, also fell victim to Prien's U-boat. A London report that Prien had been missing since April 13, 1941, was confirmed by the German high command on May 23.

Primary Education: *see* EDUCATION.

Prince Edward Island. The smallest in area but the most densely populated province in Canada, Prince Edward Island lies in the Gulf of St. Lawrence in the shape of a crescent, its inner side toward the north. The island is 137 mi. long, and varies in width from 2 to 32 mi. Area, 2,133 sq.mi.; pop. (census 1941) approximately 94,000, of which about 81% was rural. Capital, Charlottetown (approximately 16,000). Of the island's population about 80% is of British descent; 14% French; 42% is Roman Catholic and 58% Protestant, of which 28% is of the United Church, 18% Presbyterian; and 6% Anglican.

The island is nine miles from the mainland; across the separating strait powerful ice-breaking ferry-boats ply in winter and summer carrying railway cars, automobiles, passengers and freight, the crossing taking 40 minutes. There was also in 1941 a daily air mail and passenger service, two flights each way, connecting with transcontinental Canadian airways and American and Canadian Colonial airways.

Finance, Agriculture, Fishing.—To Dec. 31, 1941, the estimate of revenue was $1,700,000; estimated expenditure, ordinary, approximately the same; capital expenditure, including provision for sinking fund, $800,000, of which interest absorbed more than $300,000. The dominion subsidy was approximately $650,000. Of the revenue, $360,000 went to education, the total cost of which was $550,000. Pupils enrolled were 18,600; cost per pupil $30; teachers 700; average salary $505. The public debt Dec. 31, 1941, was approximately $6,000,000; per capita $67. Income, real estate and succession taxes are moderate.

The main occupations are agriculture and fishing; in 1941 about 485,000 ac. were under cultivation. The capital investment in agricultural industry in 1941 was $53,300,000; in manufacturing industry, $2,200,000. The estimated total value of farm products in 1941 exceeded $12,000,000; potatoes (approximately) 7,000,000 bu.; turnips 5,000,000 bu.; oats 5,000,000 bu.; wheat 250,000 bu.; hay and clover 300,000 tons; mixed grain 1,400,000 bu.; barley 300,000 bu.; butter 2,500,000 lb.; cheese 500,000 lb.

The estimated value of fisheries was $750,000; oysters 800,000 lb.; estimated fox pelts, 75,000, valued at $1,000,000. There is little serious crime, and practically no illiteracy. (CY. M.)

Princeton University. An institution of higher education at Princeton, N.J. During 1941—its 194th year—Princeton made a beginning upon contributions to national defense. The year, despite its emotional stresses, was also marked by an extraordinary record of student achievement in all fields and by advances in the university's long-range program. The impact of the national emergency was illustrated by statistics drawn from two extremes: one faculty member in three was engaged in national defense work in 1941; three freshmen in four were receiving training for service in the armed forces or in employment in defense industry.

Other significant developments of 1941 were the establishment, for the various departments, of advisory councils composed of alumni and others; provision of a building for the school of public and international affairs; extension of the creative arts program to include drama; creation, in the library, of an archives of American letters as a repository for contemporary manuscripts; and founding of the bureau of urban research. The endowment in 1941 was $33,273,602; gifts totalled $1,154,135; expenditures $4,381,758; enrolment 2,701; teaching staff 391. (H. W. Do.)

Principe: *see* PORTUGUESE COLONIAL EMPIRE.

Printing. A printing press functioning upon an entirely new principle was all but ready for unveiling during 1941 but remained under cover. It was to be not only adaptable to all three major processes, relief, planographic and intaglio (letterpress, offset and gravure) but, to mention the new principle, work might be done without contact between the cylinders, ink with metallic properties "jumping" from inked plates to paper through electromatic or electrostatic force. In principle this should effect greater speed, and it was claimed that cleaner, sharper print would also result. Too, it was one answer to the demand for lighter weight of materials, forms and presses.

Noted in 1941 was a press convertible from offset to relief printing production. One convertible from relief (letterpress) to intaglio (gravure) was announced during 1941, but use was expected to be delayed because of metal priorities. Both of these machines were developments of large manufacturers.

Letterpress.—Actually, developments chiefly outstanding during 1941 were in the field of relief platemaking. In the step-and-repeat process, offset had long had an individual efficient method of putting down on one press plate—to micrometer exactness for position and register—the number of pages or forms required for capacity of press or sheet to be printed. In the time required for preparation before starting a press, letterpress was at a distinct disadvantage, since forms had to be made up from separate units, register being finally achieved by trial and error. Equipment providing the single plate of multiple pages or items, exactly spaced as in offset, came to letterpress during the year.

Letterpress achieved a further advance during the year in the development of facilities for original plates curved to fit the press. For all rotary relief printing in the past it had been necessary to make flat original plates and from these cast electrotypes or stereotypes (duplicates) in the required curved form. The new invention obviated, or could obviate, the need for the duplicate plates. Furthermore, because a duplicate plate cast from mat or mould from an original plate does not retain the sharpness of detail, depth and full printing qualities of the original, the invention should tend to improve quality. Use of the method was not contemplated in 1941 for newspapers, but only for fine magazine and catalogue work.

Gravure.—Although not entirely new, a pioneering step in gravure printing in colours was undertaken in the application of photo-electric equipment to register automatically three colours on one side of a web and four on the opposite, with the roll of paper running through the press at the rate of approximately 1,200 ft. a minute. All but the first impression units of each section were equipped with photo-electric register devices consisting essentially of a cylinder scanning head, a web scanning head, control panel and correcting motor. The correcting motors operated compensating rolls which served to maintain register by shortening or lengthening the paper run between units rather than, as in some earlier installations, by changing the angular displacement of the printing cylinders.

Ink.—The year saw further development in the quick drying of ink. Following heat-set and cold-set inks, so-called water-set inks were developed during 1941. Water applied as a vapour, either as a spray or steam, causes ink to set quickly. The comparative simplicity of the equipment required was given as the main reason for adopting this method. On the side of product, it was claimed that excess penetration of ink is prevented, thus making the method particularly adapted to containers and cartons.

(J. L. F.)

Printing Office, U. S. Government. The office was established by authority of congress in 1860 to execute printing and binding for the executive and judicial departments and the court of claims. Its functions (1941) extend to all branches of the government and include the sale of official publications, reports and technical bulletins. Many of its publications are printed in foreign languages and find circulation in other countries. Total area occupied by the government printing office in 1941 was 1,396,973 sq.ft. or 33 ac. Value of the buildings $9,634,825; machinery and equipment $5,865,933, making the total value of the plant $15,500,758. At the end of the fiscal year 1941 there were 7,149 employees on the rolls with a pay roll of approximately $15,000,000. The office produced a total of 249,422,716 copies of publications of all classes. This total included 9,056,589 copies of the *Congressional Record*, 6,212,932 copies of specifications of patents, trademarks, designs, etc.; and 256,726 copies of the *Official Patent Office Gazette* and annual indexes. Postal cards delivered amounted to 2,560,560,000; money orders delivered, 281,572,075; and the stores division handled approximately 3,311 carloads of paper. During the fiscal year 1941 the division of public documents mailed out 646,376,829 publications and forms; its receipts from the sale of government publications during the year amounted to $1,342,699.15. The total value of all printing done was $28,593,638.71.

(A. E. Gi.)

Priorities. As the U.S.A. began to gear its vast energies for a war effort early in 1941, following preliminary attempts to launch a defense program in the last half of 1940, it quickly became apparent that the job could not be done without some governing force, some technique for regulating the flow of both raw and fabricated materials so that war production could be expedited.

This governing power was supplied by the priorities system, administered by the division of priorities of the Office of Production Management (*q.v.*). It was not a system completely thought out in advance, but one developed from week to week, in accordance with overall policy, as new problems arose. Nor was it copied after the priorities system of World War I, for the problems in 1917–18 were very different from those confronting the country in 1941, when the nation was much more highly industrialized and the demand for the machines of war was far greater.

As it gradually developed, the priorities system was intentionally kept flexible, on the theory that it was far more important to fit the treatment to the problem than to fit any given problem to a rigid and preconceived formula.

The primary job of the priorities system administrators was to take control of scarce materials and regulate their distribution, so that military producers could get these materials when necessary. This control was also imposed on fabricated parts, subassemblies and accessories as well as raw materials. As control was extended, more and more goods were diverted to military use, and this, plus shortages, caused a very considerable diminution in supplies of civilian goods.

Throughout the early part of 1941, shortages first appeared and then rapidly grew worse. More materials were brought under priorities control—aluminum, then magnesium, and then all other critical metals and many other materials. And as the supply situation became more crucial, a pattern of control began to emerge.

Priority Ratings.—The outline of the pattern of control can best be shown by listing briefly the principal tools with which the priorities system operated at the end of 1941.

1. *Individual Preference Rating Certificates.*—The individual preference rating certificate was the most common device used. The certificate was used to give priorities assistance to some individual manufacturer, who needed some particular commodity or part, for some particular purpose. A manufacturer who needs

a motor, for example, can apply for an individual preference rating certificate (by filling out the standard application form, PD-1) and, if granted, the certificate can be served by the manufacturer on his supplier, to require prompt delivery of the material the applicant needs to complete a military or other important order. Individual certificates can be given either by the priorities division or, if army or navy orders are involved, by field contracting officers of these agencies, under the control of the priorities division. The armed services, of course, use individual certificates to require prime contractors as well as sub-suppliers to turn out necessary products when needed.

2. *Blanket Ratings.*—Some manufacturers could not operate successfully by constantly filling out applications for each and every order with which they had difficulty. Because of this, the "blanket" preference rating order was worked out. A blanket rating, issued usually to a company or companies engaged almost wholly in important military or civilian work, grants the manufacturer or manufacturers one preference rating which can be used continuously, over a stated period of time, to obtain materials. Blanket ratings were issued, for example, to machine-tool builders, freight-car builders and aeroplane manufacturers who, otherwise, would have had to make out thousands of individual applications all the time—an intolerable burden of paper work.

3. *Project Ratings.*—Construction of new plant facilities also required priorities assistance, since shortages existed in building materials (for example, structural steel). The project rating was worked out to meet this need. A project rating can be used by the builder to obtain materials going into the project, but it cannot be used to obtain raw materials going into production lines. The project rating is similar in form to a blanket rating.

4. *Production Requirements Plan.*—As the system developed, it became apparent that a large number of manufacturers faced another kind of problem—they had to have materials in stock, and in some cases had to begin production, before they received actual orders. They also needed to know in advance what materials they could reasonably expect to get. A typical case would be that of a manufacturer of small hand tools, who is often called on to make immediate delivery. To meet this kind of problem, the priorities division worked out the defense supplies rating plan, which was later supplanted by the production requirements plan. Under the production requirements plan, a manufacturer is permitted to fill out a special form (PD-25A), showing his requirements for scarce materials over a coming calendar quarter, and showing also the kind of business in which he is engaged, the grade of orders on his books, and the general importance of his products in the economy. When this has been done, the division of priorities may assign the manufacturer a rating, or ratings, which he can use continuously over a calendar quarter to obtain materials for approved production. This simplifies the manufacturer's problem, because, after his requirements have been approved, he can use a single rating or a combination of ratings continuously, during the time permitted, and thus does not have to fill out new applications every day. This plan is similar in some ways to the usual blanket rating, but it can be used to assist manufacturers who are not necessarily putting all their efforts on primary military production. A plant 40% on defense, that is, might get a rating under this plan which would help it get materials going into that 40% of important production. But such a plant might also get another rating to facilitate production of nonmilitary items considered of general importance in the economy.

"THE NEW BOARDER." Priority rulings of 1941 as seen by Carlisle of the *Des Moines Register*

5. *"M" Orders.*—When priorities control is imposed on the distribution of some raw material—for example, zinc—this is done by means of an "M" order. An "M" order states that the material is under the control of the director of priorities. It usually sets up a formula telling producers that they must fill defense orders ahead of nondefense orders and also giving other specific directions about the permitted operations of producers. An "M" order is one of the most important used, since it specifically and rigidly controls the distribution of a basic raw material.

6. *"E" Orders.*—The "E" order is like the "M" order in that it regulates distribution, but the "E" order applies only to equipment, such as machine tools and cutting tools, and tells how they may be distributed.

7. *"L" Orders.*—These are limitation orders and are designed to cut down the production of less essential commodities which are large consumers of critical materials. For example, the production of automobiles, washing machines and refrigerators was limited by "L" orders.

8. *Conservation Orders.*—From time to time, conservation orders (usually in the "M" series) are issued to shut off the use of some scarce material in nonessential items. For example, order M-9-c, a conservation order, was issued in 1941 to prevent the use of copper in nonessential products like ash trays and screens.

These are the basic types of priorities orders. The ratings assigned in the priorities system (the same ratings are used, whatever the kind of order involved) are graded in a ladder-like structure, starting with AA at the top and running down to B-8 at the bottom. A preference rating shows the relative importance of the contract or order to which it is attached, and thus permits a producer to give priority to the more important orders.

It should be noted that the instruments listed fall into a definite pattern. If we regard the economic machine as having a "top" and a "bottom"—the "top" representing finished goods and the "bottom" representing raw materials—it would be seen that some of these instruments impose regulation at the top, and others impose regulation at the bottom.

The devices which impose regulation at the top, or give assistance for the production of finished goods, are generally known as "identification instruments." That is, they identify the end importance of some finished item, such as a tank, a plane or a transformer.

The individual certificate, the blanket rating, the project rating and the rating or ratings given under the production requirements plan—these are all identification instruments, facilitating the final production of a finished item or class of items.

On the other hand, the "M" order and the "E" order are obviously distribution instruments—that is, they regulate the distribution of raw materials or production machinery. The "L" order is similar to the "M" and "E" orders in that, although it limits production of finished goods, its real purpose is to free raw materials so that they can go into the production of military goods. The conservation order has a similar purpose, and this was also true of the first civilian rationing order, issued during the last week of 1941, to conserve the nation's rubber supply for war purposes and the most essential civilian needs.

By means of these instruments—identification instruments at the "top" and distribution instruments at the "bottom"—the priorities system can be administered so that goods and materials required for war products can be made available in the defense plants of the nation, even if this means cutting off the supply from less essential channels.

By the end of 1941, "M" orders had been issued to control the distribution of 50 materials and classes of materials. The priorities division had issued 69 blanket rating orders to various industries, and had issued 17 limitation orders, 2 "E" orders and 3 conservation orders. (The rubber rationing order was issued by the Office of Price Administration [*q.v.*].) In addition, the priorities division and the armed services together had issued well over 1,000,000 individual preference rating certificates on prime certificates and extensions of these certificates to sub-suppliers.

Allocations.—Toward the end of 1941, it was announced that increasing emphasis would be given to the allocation of materials. The word "allocation" caused considerable confusion. The allocation of materials was a logical development of the priorities system, and did not take its place, although there was a continued trend toward increased use of the allocation technique.

The reason for the shift toward allocation stems from shortages, the real progenitors of the priorities system. As shortages of raw materials increase, priorities certificates, of whatever kind, become less effective. When too many "pieces of paper" are floating through the economic system, the "currency is debased." Thus, to make absolutely sure that materials go where they are needed most, it is more effective to allocate—that is, to order specifically what amounts of what material must be shipped

to what plant. Allocation had been used since the very start of the defense program, in fact, and some of the first materials put under priorities control—aluminum and magnesium, for example—had always been allocated month by month.

An allocation system is a priorities system—a tight and effective one. The main difference between the two is a matter of technique. The original priorities system gave a producer a "tag," which sometimes wasn't high enough to get him the material he wanted; the priorities technique known as allocation is virtually a flat stipulation that the material allocated will be shipped, since allocations can only be made within the limit of material available.

Special Activities.—During 1941, officials charged with administering the priorities system put increasing emphasis on the following points:

1. *Inventory Control.*—An effort was made to keep inventories to the lowest possible practicable working minimum. Inventory clauses were included in all priority orders.

2. *Scheduling.*—Emphasis was given to proper scheduling, so that manufacturers and military services would not order materials for delivery before the time actually required.

3. *Substitution.*—Because of scarce raw materials, an effort was made to get manufacturers producing civilian goods to substitute less scarce materials in their products. Successful efforts were also made to help the armed services substitute less critical materials wherever possible.

4. *Compliance.*—The priorities division set up a field service and compliance section with two broad functions. Through the field service it assists businessmen and manufacturers in all parts of the country to solve their priorities problems. Through its compliance section it checks inventories, operations and other procedures in plants everywhere to see that rules and regulations are obeyed.

Legal Authority.—During its early days, the priorities system was badly hampered by lack of sufficient legal authority. The original authority for the operation of the system was found in Section 2A of Public 671, 76th congress, approved June 28, 1940. This paragraph provided that the president, in circumstances of emergency, could give priority to army and navy orders. This authority, however, was not sufficiently broad to provide backing for allocations or for priority orders affecting purely civilian operations. Because of this, the congress later amended Section 2A of Public 671 by Public 89, 77th congress, approved May 31, 1941 (the Vinson act). This amendment gave the president additional authority to give priority treatment or allocation treatment to almost any order whenever necessary in the interests of defense. Later, specific authority to requisition articles, materials and property for defense purposes was granted the president by Public 274, 77th congress, approved Oct. 16, 1941.

These authorities, together with other related legislation and executive orders, gave the president and, through him, the OPM and its division of priorities complete legal authority for the priorities system.

Closely related to the legal authority previously cited is Priorities Regulation No. 1, a basic document which the division of priorities issued originally on Aug. 27, 1941, amending it on Dec. 23, 1941. This regulation requires the acceptance of defense orders and other orders bearing preference ratings, even if these ratings apply to civilian orders; includes provisions designed to keep inventories to minimum levels; and sets forth other detailed regulations applying to all transactions unless provisions to the contrary are included in any specific order.

Personnel.—In the early days of 1941, the priorities division, as one of the principal operating arms of the office of production management, was under the direction of E. R. Stettinius, Jr. (*q.v.*). Later, however, the Supply Priorities and Allocations board (*q.v.*) was created, and Donald M. Nelson (*q.v.*), executive director of SPAB, was also named director of priorities. Then, in Jan. 1942, both OPM and SPAB were abolished and priorities and allocations were taken over by the new War Production board, of which Nelson was named chairman.

At the end of 1941, following the entry of the U.S. into the war, the priorities system was being simplified in all ways possible. The facts and figures of the situation indicated that it would be more necessary than ever before to divert increasing amounts of required materials and products from ordinary channels into the channels of war production. The nation was faced with an unprecedented demand for orderly production of the materials of war. (*See* also BUSINESS REVIEW; DEFENSE, NATIONAL [U.S.]; SUPPLY PRIORITIES AND ALLOCATIONS BOARD.) (S. E. F.)

Prisons. Various new buildings were constructed in prisons of the United States during the year 1941. A factory to house all industries, except jute manufacturing, was added at San Quentin, Calif.

The Oregon penitentiary completed a dormitory, kitchen and dining room for the farm on which only trusties were employed. Utah opened a new state prison and farm.

A stainless steel, streamlined cafeteria was installed at the Connecticut state prison and did away with the old and inefficient method of serving food in the aisles between tables. The Iowa state penitentiary completed a modern power plant containing a water softener and purifier. At the Kentucky, Wisconsin and Virginia state prisons, modern cell houses, each containing approximately 600 single cells, were erected. These structures eliminated the previous congestion in those institutions.

Maryland reported the opening of a new prison and farm for women, thereby eliminating the practice of incarcerating female offenders in separate wings of male institutions. Minnesota constructed a dormitory on the prison farm where approximately 250 men were employed the year round and not returned to the institution proper. New Hampshire likewise constructed a dormitory for prisoners working outside the walls.

TIER OF CELLS in the prison opened at Green Haven, N.Y. Oct. 1, 1941 to relieve congestion at Sing Sing and other "maximum security" prisons of New York state

In California and Nevada, radio earphones were installed in each cell, and in the former state as well as Tennessee, classification boards were appointed. These boards functioned along the lines of those already established in other jurisdictions. Inmates were to be thoroughly examined and subjected to correctional treatment designed to effect their rehabilitation.

Iowa, Montana, North Dakota and South Dakota instituted new school systems and in many of the other states the scope of vocational training was considerably enlarged. The reasons were twofold: It was felt that the teaching of trades would afford offenders opportunities to eke out a living upon release. Furthermore, prison factories, manned by skilled labour, could function more efficiently.

The year 1941 saw many institutions commence the manufacturing of articles for defense. As a result, idleness, the most deteriorating aspect of penal life, diminished considerably. In fact, in some prisons the inmates worked on two to four shifts and in all instances patriotism rather than compulsion was the motivating factor. Some institutions reported that offenders gave their blood to Red Cross units and that others purchased defense bonds from their penal earnings.

Of importance was the enactment of congress permitting certain types of released felons to join the armed forces of the United States.

Europe.—Because of the war, little information was available about crime or prisons in Europe. Great Britain, however, was the exception. In that country there was a decrease in offenses of violence, but an increase in property crimes and juvenile delinquency. That can be expected during periods of conflict when the community is seriously disorganized. Many short-term prisoners, however, were released on parole and allowed to join the home defense units. In all penal institutions, even though some were subjected to bombardment, the manufacture of war materials continued.

South America.—In Brazil, Chile and Uruguay new cell blocks were constructed in the prisons and educational programs inaugurated. It was also reported that offenders in those countries received compensation for work performed in prison factories. Mexico, which previously restricted

connubial visits to short-term prisoners, afforded that privilege to all who lived up to institution regulations. Those visits were permitted bimonthly in some prisons and monthly in others. (L. E. L.)

Private Schools: *see* EDUCATION.

Prizes: *see* LITERARY PRIZES.

Production, Industrial: *see* BUSINESS REVIEW: *Industrial Production.*

Production Management, Office of.

The Office of Production Management was established Jan. 7, 1941 by President Roosevelt as the principal instrumentality for effecting a speedy production of weapons for defense. William S. Knudsen, General Motors executive, was appointed director general, and Sidney Hillman, labour leader, was named associate director general.

Originally organized in three divisions—production, priorities and purchases—the OPM later added a labour division to deal with this aspect of national defense.

As the defense program grew and the need for speed in production became imperative, the OPM was reorganized to centralize and simplify its procedures.

Commodity sections were first set up, but with the creation of the Supply Priorities and Allocations board August 28, 1941, industrial branches were substituted. The order that established SPAB also gave OPM broader powers.

The 30 industrial branches thus created were allocated among four of the seven OPM divisions for administrative supervision. These were (1) the production division, (2) the purchases division, (3) the materials division, (4) the priorities division, which really had no branches but assigned specialists to each branch that had priority problems.

Among other OPM divisions, the contract distribution section was set up to spread defense orders and thus help industries affected by priority restrictions; this "subcontracting" was also designed to speed the conversion of such industries to defense work. The labour division was established to handle the many labour problems incident to creation of a wartime economy, and the bureau of industrial conservation worked closely with any or all OPM divisions to turn waste into useful production channels.

When Harry Hopkins returned from a four-week trip to England early in 1941 as President Roosevelt's personal emissary and said that Britain was in desperate need of munitions and supplies, OPM was already under way as a functioning organization. In response to Britain's plea, the lend-lease bill was signed March 11, 1941, and the United States added another huge task to its already great defense effort—that of becoming "the arsenal of democracy." (*See* LEND-LEASE ADMINISTRATION, OFFICE OF.)

Responsibility for the successful completion of this task resided largely in the OPM. The building of factories, retooling of existing plants for new production uses, the provision of adequate raw materials, the priority listing of scarce metals and materials—all such day-to-day problems were handled by OPM in 1941.

This new large-scale manufacture of war weapons created many dislocations in civilian life. Families moved to new industrial centres. The price structure underwent strains as equitable wage levels were sought. Wage earners had to be protected against profiteering at the same time that production was being forced to new highs. Employer-labour disputes had to be held to a minimum and settled swiftly.

Some of the dislocations that the U.S. wartime efforts created showed up in Feb. 1941, when the demand for aluminum for plane production became so great that OPM was compelled to place the metal on the priority list. Subsequently OPM placed priority bans on a host of other metals and materials needed for arms. As a result, defense production soared. In June 1941, the United States produced 1,476 military planes; two months later this figure jumped to 1,854.

On Oct. 1, 1941, the United States and Britain agreed to back the Russian war against Germany with supplies. The main burden of producing more war weapons fell on the U.S., and OPM had to devise ways and means to squeeze still another notch from the nation's straining economic machine.

After the Pearl Harbor attack drew the United States into the war, congress passed a $10,500,000,000 bill providing funds for new army and navy defenses, and at the same time the navy department asked congress for authorization to build 165 new warships. Prior to the outbreak of war in the Pacific, industrial production in the United States surpassed even 1929 records; and unemployment, except in cases of temporary dislocations caused by conversions of peacetime factories into wartime plants, was becoming a memory of the past. But OPM was now preparing to throw the complete industrial resources of the United States into an all-out war effort. The earlier "business as usual" attitude of U.S. industry went by the boards, and OPM, acting in conjunction with the Office of Price Administration (*q.v.*), moved to take over almost complete control of the U.S. economy. On Dec. 26, 1941, the OPA placed new tires under permanent rationing to conserve rubber for military use, and on Jan. 2, 1942 all motor car production for civilian use was halted "for the duration."

A gigantic task faced OPM for 1942 as the president asked for production of 60,000 planes, 45,000 tanks, 20,000 anti-aircraft guns and 8,000,000 tons of merchant ships.

Criticism of the OPM in 1941 was as varied as the many special interest groups from whom it came. Labour charged that OPM exercised too little control over big business interests; capital charged that it exercised too much control; small business groups complained that they were being "squeezed out" of the defense contract picture. But one fact was frequently lost sight of in the welter of complaint and criticism: that the OPM was purely a consultative and administrative body, lacking decisive powers of action. Virtually all the new agencies set up by the president to meet U.S. defense needs were organized with the idea in mind of better utilizing already existing agencies within the government. Thus, the OPM, although charged with the responsibility of facilitating and implementing the production of war and defense materials, had no power to place contracts. All contracts were let by the army or navy or similar governmental agencies. This serious hiatus between plan and achievement was a principal point of criticism in 1941. (*See* also DEFENSE, NATIONAL [U.S.]; EMERGENCY MANAGEMENT, OFFICE FOR; HILLMAN, SIDNEY; KNUDSEN, WILLIAM S.; LEATHER; MUNICIPAL GOVERNMENT; SUPPLY PRIORITIES AND ALLOCATIONS BOARD.)

The War Production Board.—By executive order of Jan. 16, 1942, President Roosevelt established the War Production board, with Donald M. Nelson (*q.v.*) as chairman. The order defined the duties and prerogatives of the chairman as follows: (1) to "exercise general direction over the war procurement and production program"; (2) to "determine the policies, plans . . . and methods of the several federal departments . . . in respect to war procurement and production . . ."; (3) to take over the functions of the Supply Priorities and Allocations board which was abolished by the order, and (4) to supervise the OPM. The latter board was abolished by Nelson Jan. 21, and its functions and personnel were incorporated into the new WPB. On the same day Nelson announced the organization and executive personnel of the new board. Serving with the chairman on the general board were Henry A. Wallace, William S. Knudsen, Sidney Hillman, Leon Henderson, Harry L. Hopkins, Jesse H. Jones, Henry L. Stimson and Frank Knox (*qq.v.*). Six main divisions were set up, as follows: the purchases division, headed by Douglas MacKeachie; the production division, headed by W. H. Harrison; the materials division, headed by William L. Batt; the division of industry operations, headed by J. S. Knowlson; the labour division, headed by Sidney Hillman and the civilian supply division, headed by Leon Henderson. In addition, Nelson provided in his organization for a planning committee, a requirements committee, a progress-reporting committee, a statistics division, a legal division, an administrative division and an information division. Further, he appointed Ernest C. Kanzler to supervise the conversion of the motor car industry into arms production.

Profits, Company: *see* BUSINESS REVIEW: *Company Earnings.*

Progressive Education: *see* EDUCATION.

Propaganda.

In a broad sense, propaganda is persuasion, or an attempt to persuade. Usually it is thought of as an expression of opinions or facts or alleged facts. Occasionally, however, acts or events are more potent than words in shaping the beliefs, emotions and actions of people. Propagandas of 1941 fell into four main categories.

I. *The Government Preparedness Program*—consisting of recommendations and executive acts by President Roosevelt and legislation by congress to safeguard the United States against attack, to aid the anti-axis powers and to prepare for possible military offense. In this category, for example, were: passage of lend-lease act; American seizure of axis shipping; establishment of bases in Greenland, Iceland and Dutch Guiana; declaration of state of unlimited "emergency"; establishment of office of civilian defense; allotment of lend-lease to Russia; freezing of axis assets in the United States; Roosevelt's order to navy to "shoot first"; Roosevelt's "Four Freedoms"; formulation of the Atlantic charter, the Roosevelt-Churchill statement of peace aims; Roosevelt's personal peace appeal to Japanese emperor.

II. *The Great Debate* between those, on the one hand, who supported the program of President Roosevelt and, on the other, the many noninterventionists and isolationists and the smaller groups of pacifists and of fascist sympathizers.

Among the opponents of intervention, until June 22, when Hitler attacked Russia, were the communists and some communist sympathizers.

III. *The Attack on Pearl Harbor* Dec. 7—an event which launched the United States into war with Japan, Germany and Italy, which overnight ended the great debate and, in conjunction

THE U.S. SENATE CAUCUS CHAMBER was crowded Sept. 9, 1941 as senators opened their investigation of alleged war propaganda in U.S. motion pictures

with Allied dependence upon the Russian army, seemed to mark the beginning of the end of Hitler's amazing career as the most effective propagandist of modern history.

IV. *The Building of Morale for Fighting and Sacrifice*—a program stemming from the federal government and embracing and stimulating all manner of propaganda activities by national, state and local governments; by banks, business and labour; by schools, colleges and churches; by civic groups and patriotic societies; by the newspapers, magazines and radio stations.

All four categories were interrelated—a fact that is clearly revealed when one examines category III—the attack on Pearl Harbor. This was not only the most influential event of the year, but it had the effect of being the most significant occurrence in a score of years as counterpropaganda against fascism.

Its significance is seen in the light of the following background facts:

Since the start of World War II, the American people had debated intervention and nonintervention. As the war grew in intensity, this "great debate" both reflected and stimulated the most profound division of the American people since the Civil War.

Pearl Harbor ended this division instantly; more, almost overnight it cancelled out more than 20 years of propagandas which had had two effects: first, to condition millions against participation in another world war; second, to condition many to fear communism and to welcome or tolerate fascism as a safeguard against it. (*See* also PSYCHOLOGY: *Public Opinion and Morale.*)

Rudolf Hess.—On May 10, 1941 there developed one of the most spectacular propaganda acts of the war—the landing in Scotland of Hitler's deputy fuehrer, Rudolf Hess (*q.v.*), persistent anti-communist. Of the many conjectures associated with the Hess episode, the most reasonable in terms of Hitler's propaganda pattern is that Hess was sent to inform important personages in Britain of Hitler's intention to attack Russia, and through them to persuade the British government to make peace with the nazis. The duke of Hamilton, to whose estate Hess had flown, was a member of the Anglo-German fellowship, a group which in the appeasement era had urged close British collaboration with the nazis.

If this was the propaganda carried by Hess, it was not effective. Churchill promised parliament a full revelation, but he did not make it in 1941.

Morale.—The main objective of U.S. and Allied propaganda in the closing days of December was to maintain and strengthen the high morale created by a propaganda of events and of deliberate acts. In the field of foreign policy the main object was to eliminate mistrust and suspicion existing between the soviet and Allied powers, and this was largely accomplished in the last three weeks of December. To build morale among haters of fascism in conquered nations, England, during the year, launched its V-for-Victory propaganda.

In the field of U.S. domestic policy there were areas of weakness which had to be corrected by a propaganda of word and of deed. All of these were associated with the disparity between promises associated with the preachment of democracy and performances in actual practices. Equally important in these areas of weakness were problems of discrimination against aliens and Negroes and the problem posed by the demand of labour organizations for full participating share in government in carrying forward the wartime production program.

It was recognized by the administration, and particularly by the attorney general Francis Biddle, Jr., that in World War II the nation would seriously weaken its morale if it permitted discrimination against foreign born and the children of foreign born merely because they had alien names. Accordingly, the department of justice in 1941 went to extraordinary pains to prevent injustice to aliens loyal to the democratic cause.

Discrimination against Negroes was another weakness in American morale. It had been brought to the president's attention repeatedly in the months and years preceding Dec. 1941. Many Negroes were resentful because Negroes were not being employed in defense industries. Various Negro organizations had planned a "march on Washington" for July 1941, to demand that congress end such discrimination. This propaganda act of the Negro groups was forestalled by President Roosevelt who appointed a fair employment practice committee and who on June 25, 1941, issued an executive order which provided that all companies working on defense contracts were obliged "not to discriminate against any worker because of race, creed, colour or national origin."

Another factor which threatened to be increasingly destructive of morale through the months of 1941 was the persistence of labour organizations for representation in the national defense program on a par with that of management and industry. Coupled with this was the issue brought about by numerous strikes, lockouts and labour's demand for a closed shop. Until the attack on Pearl Harbor it seemed that the bitterness of the propaganda battle between labour and capital would be increasingly destructive of the morale required in an adequate defense program. After Pearl Harbor this propaganda battle ended as the result of an agreement reached by the president's labour-industry conference to outlaw strikes and lockouts for the duration of the war. It was decided to set up a new labour board on which labour would be equally represented with capital to adjudicate labour disputes. This, as a joint act, participated in by government management and labour, worked as propaganda to build national morale.

Intervention vs. Nonintervention.—Had the attack on Pearl Harbor been deferred until 1942, this account of significant propagandas for 1941 would have dealt almost entirely with the greatest battle of propagandists which the U.S. had beheld since the time of the Civil War: the interventionists vs. the noninterventionists and isolationists. Millions of humane, patriotic and democratically-minded men and women in the U.S. were saying in the years which followed World War I, "America fought once to make the world safe for democracy and as a result got only depression in all countries, and dictatorship and an end of democracy in most of the countries of the world. Why fight again when the result this time may bring dictatorship to our own shores?" Others less humane, less patriotic and anti-democratic repeated this theme. Some, like nazi bundists, did so with the belief that fascist dictatorship in Europe and perhaps in America was a desirable means of stabilizing a society rent by economic dislocation and social unrest and bringing it under the control of a governing elite. The interventionists, through such organizations as the Committee to Defend America and the Fight for Freedom, Inc., and the noninterventionists, as represented by such groups as the America First committee and the Keep America Out of War congress, had utilized every propaganda technique and every channel of communication in their tremendous efforts respectively for intervention and nonintervention. In great mass meetings, in radio broadcasts, in newspaper advertising, booklets, hand bills, folders, group meetings, sermons, school and college assemblies, the participants, through the year and up to the very day of Dec. 7, had carried forward what became known as the "Great Debate."

As men like Col. Charles A. Lindbergh (*q.v.*), John T. Flynn, Gen. Robert E. Wood (*q.v.*), and Senators Gerald P. Nye and Burton K. Wheeler (*q.v.*) spoke against participation in the war, and as others like

Wendell Willkie (*q.v.*), Herbert Agar and Senator Claude Pepper spoke for participation, the debate grew in intensity and bitterness. Even the president resorted to name calling when he designated Col. Lindbergh as a copperhead. The president, however, made no move to stop the debate—an act which was itself highly important propaganda for a nation which he was asking to prepare to fight for democracy with its freedoms of speech, press and assembly. Many newspapers were interventionist. The most powerful newspapers ranged on the side of the noninterventionists were the *Chicago Tribune* and the *Daily News* of New York. Most of the newspapers, regardless of editorial conviction, printed the news of both sides in the debate. Radio chains almost universally carried the speeches and news of both sides.

Participating in this debate, too, were numerous groups and individuals representing movements and organizations ranging from the extreme left to the extreme right. There was, for example, the Communist party. Prior to Hitler's attack on Russia June 22, 1941, its propaganda had been strongly noninterventionist. It saw the war as "just another imperialist struggle." The communist propaganda line changed overnight with the Hitler attack on Russia. The communists then propagandized for the support of President Roosevelt's war measures and for U.S. participation in the war "to bring justice and democracy to all people."

At the extreme right was Father Coughlin and his magazine *Social Justice*. This magazine consistently opposed participation in the war until Dec. 7. Even after Pearl Harbor it continued to see Stalin's communism as the chief foe of the U.S. and of the world, continued to disseminate anti-Jewish propaganda and to link the Roosevelt administration with Jewry.

Between extreme rightists and extreme leftists were such pacifist organizations as that of the National Council for the Prevention of War and the Fellowship for Reconciliation. These and similar organizations, pacifist in platform and preachment, continued to exist after Pearl Harbor and to propagandize for a warless world. There were religious organizations like the Quakers and the Brethren which followed the same line. There were religious publications like *Christian Century*, strongly pacifist and noninterventionist through the war period, which continued after Pearl Harbor to see the war as something which should not have the sanction of God.

As the year 1941 ended, nearly every noninterventionist and every isolationist, outside of conscientious objectors and pacifists like the Rev. Dr. John Haynes Holmes of New York, dropped all opposition to U.S. participation. On the foundation of national unity thus achieved, President Roosevelt looked forward to a 1942 which would see larger realization of an international unity against the axis, a unity to bind and co-ordinate even closer the propaganda and military power of the United States, Great Britain, Russia, China and other powers. The nation was to be prepared for great material sacrifices. This called for a combination of propaganda of exhortation (of which Churchill and Roosevelt were masters) and of factual information, complete machinery for which had been set up by the United States government under the leadership of Archibald MacLeish in 1941. (*See* also GERMAN-AMERICAN BUND; UNION NOW.)

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Proportional Representation.

Proportional representation was applied in several cities on Nov. 4—in New York, N.Y., for the third time in electing the city council, for which there were 88 candidates. The *modus operandi,* typical of other places where the system prevails, was described in the *New York Times* as follows: "After he records his choices for other offices on the voting machine, the voter receives a . . . ballot bearing the names, in alphabetical order, of the council candidates for his borough, (which) he is instructed to enter a separate booth and there mark. Instead of indicating his choice by X, he writes 1 before his first choice, 2 before his second and so on until he has expressed all his preferences." Profiting by the experience of previous years, the P.R. vote was larger (thus ensuring more councilmen, whose number is determined by the size of the vote) and the count more rapid, thereby removing a chief ground of criticism. In Richmond (Staten Island, N.Y.), with but two candidates, the result was announced on Friday following the election. The identity of all councilmen-elect was definitely known within a week. There were 26 in all, of whom 17 were Democrats; but their two-thirds majority in the previous council (sufficient to override the mayor's veto) was lost.

That 378,393 blank and invalid ballots were cast shows that a large fraction of the electorate had not yet learned how to use the greatly amplified voting power which the new system gave it; but both the Australian ballot and the voting machines required many more than three trials to teach the electors how to use them intelligently.

The council on Dec. 9 voted, 12 to 5, to repeal sec. 43 of the New York city charter which provided the P.R. machinery. The repeal measure must still be adopted by the board of estimates, approved by the mayor and ratified by the voters. In Yonkers, N.Y., also, the city council was chosen by P.R., three of its five members having campaigned on a platform of rigid economy.

Cambridge, Mass., adopted P.R. (25,875–18,323) at the 1940 general election, after an active campaign in its behalf promoted by a committee of which Dean Landis of the Harvard Law school was chairman. On Nov. 4, 1941 the voters chose a city council of nine members and a school committee of six, both by P.R. For the former there were 82 candidates (of whom 11, about equally divided between the parties, were endorsed by the reform committee) and for the latter, 27. (*See* also ELECTIONS.)

See Hogue, *Proportional Representation* (1926). (C. S. L.)

Protestant Episcopal Church.

During the year 1941 the life and work of the Episcopal church, and the whole religious life of the United States, was powerfully affected by the obligation, and the ever-increasing necessity, of full participation in World War II, in which the very principles of Christian and civilized life were at stake.

In the Episcopal church this was shown by a deepened spiritual earnestness, by a marked general increase in church attendance, by the continued response to the Forward in Service program, and by the fact that, considering the serious financial outlook, the contributions for the work of the church were well maintained.

The statistics for 1941 show slight losses in some items and gains in others. The total number of baptized persons reported in 1941 was 2,162,022, a slight increase over 1940, and the number of communicants reported was 1,519,483, an increase of 34,434 over 1940.

The foreign missionary work of the church necessarily was much affected by World War II, especially in the far east. As a result of measures adopted by the Japanese government, U.S. bishops in that country were obliged to withdraw from their fields of service before the end of 1940 and to leave the work of the church to be carried on by native Japanese bishops and clergy.

An event in 1941 of high importance and interest to the Episcopal church and to the cause of religion generally was the opening of the entire length of the cathedral of St. John the Divine in New York, the largest cathedral in America and the largest Gothic cathedral in the world. In a time of world crisis, and in view of what had occurred in other lands, the opening of this great cathedral in a metropolis of the United States had far-reaching significance. (W. T. M.)

Prunes: *see* PLUMS AND PRUNES.

Psychiatry.

War and Mental Disease.—The general influence of war conditions on mental disease was summarized by Hemphill, who had had a wide experience during 15 months of warfare and six months of intensive air-raid attacks in Bristol, England. The civil population of Bristol had to endure

as much war as any other great city in England outside of London. The total population of the city increased by many thousands after the outbreak of war, but the number of patients admitted to the Bristol mental hospital in 1940 was the lowest in five successive years. There was a falling off in the number of patients suffering from psychoneurosis and the milder types of mental disorder, especially among women. Hemphill observed that the psychogenic importance of war on civilians is negligible and that, moreover, it has even proved beneficial to persons of certain mental constitutions, as shown by the fall in the female voluntary admissions. The communal life that has been developed as the result of air activity both within and without the hospital was found to be of importance in combatting fear and anxiety. War gives freer rein, reported Hemphill, to instinctive tendencies, to aggressiveness and also adds to individual responsibilities.

Report by Fox related to the effect of the air raids on persons suffering from epilepsy, both adults and children. In a large hospital in England where groups of about 250 epileptic children and 200 adults were hospitalized, there was no general increase in the number of attacks on days or nights of air raids, nor was there any evidence found of increased seizures in individuals. This bears out the theory that has long been held by many that epilepsy is a physical rather than a mental disease and thus can be sharply contrasted with the psychoneuroses.

One of the most striking phenomena developed during World War II in 1941 was that of Quislingism and its variants. A study of the type of individual who becomes a Quisling was made by Ernest Jones. He concluded that the key to the understanding of Quislingism and other phenomena connected with it is based on the fact that all Quislings have a peculiar inability to face or even recognize an enemy. Most of the people who become Quislings are in the group either of the dissatisfied or of the insecure. In Austria the nazi invasion took place largely among the dissatisfied and ambitious, often junior members of firms or banks, or members of government departments. Those people most subject to nazi propaganda, moreover, were not securely established in the community.

Schizophrenia.—Many patients with severe mental disease may be cured through various means of psychotherapy, "shock" treatment and hospitalization. Cures are apparently possible in diseases such as schizophrenia (dementia praecox). Rennie gave 100 instances and believed that the most striking single factor for recovery is a long-term contact with a physician or a clinic. Patients with schizophrenia are capable of accepting guidance or of solving personal conflicts with the help of a psychiatrist. Important also are the presence of a favourable environment to which the patient can return and the help to be obtained from co-operative families in carrying out recommendations. The patients who do best are those whose symptoms begin in the third decade of life, with an acute onset, followed by a short period of hospitalization and rapid recovery within six months. In this group recurrences are rare and in no case observed by Rennie did more than two relapses occur. In this group of patients, moreover, the effect of "shock" therapy is most likely to be efficacious. The recovery rate in schizophrenia is not appreciably increased by "shock" treatment.

Treatment.—One of the chief aims of psychotherapy has always been to give the patient insight into his own condition. The inability of the normal or even of the extremely intelligent person to see the obvious facts in his life situation is a familiar observation. In many psychoneurotic states, moreover, the loss of insight is one of the chief symptoms of the disease. Cleckley warns against the attempt to give patients insight into their conditions rapidly. At times it may be extremely unpleasant and if insight should come too suddenly, psychoneurotic patients are sometimes overwhelmed and attempt suicide or suffer the personality dissolution of a psychosis. In severe instances, therefore, insight should be disclosed in a gradual manner. As Cleckley says, "The patient may have to build positively some edifice for his personality before he can abandon the old building of his illness. Once a start, however small, has been made in normal living, the biological tendencies that make for health may find a foothold." This is a timely warning, for the handling of psychoneurotic patients by physicians not qualified to do so has often led to disaster, particularly in regard to the forcing of insight into the patient's condition more rapidly than is advisable.

The subject of "shock" treatment in psychiatry continued as the leading subject of investigation. Each of the three current methods of producing "shock"—by insulin, metrazol and the electric current—has its adherents. Enough time has elapsed since insulin treatment was inaugurated so that a comparison between one group treated by the usual psychotherapeutic methods of a large mental hospital, without added insulin "shock," and a similar group treated in the same way, plus insulin, can be made. Cheney and Clow found that 12% recovered and 42% were benefited by psychotherapy alone, contrasted with 16% recovered and 36% benefited in the group having the additional insulin "shock." Thus, it is concluded that both methods are important and that the insulin treatment does not materially alter the prognosis in the most serious of mental diseases, namely schizophrenia. As previously indicated, fewer permanent cures are reported year by year and, in some institutions, insulin "shock" treatment has been abandoned, or replaced by other methods. Metrazol treatment, also, with the possibility of spine fractures from sudden convulsions, was less used in 1941 than in 1940. Although most writers feel that no patient is made worse, as far as his mental symptoms are concerned, by this form of therapy, and permanent brain damage has not been observed except in rare instances, the consensus was in 1941 that metrazol "shock" can only, as pointed out by Cheney, Hamilton and Heaver, "bring about a change which facilitates other forms of treatment and accelerates recovery so that hospital residence is shortened, sometimes in a strikingly dramatic manner." There were some indications, moreover, that both insulin and metrazol treatments may be supplanted by electric "shock" therapy. Each form of "shock" produces a convulsive seizure, with momentary loss of consciousness. In the electric method, the dosage is easily controlled, a factor long a deterrent to the use of the other methods. With a known stimulus, dosage can be graded until the best results are obtained, without injury to the patient. Reports from various clinics indicated that the effects produced on the mental disease with electric "shock" are equally good, when compared with insulin or metrazol as a stimulant. It was too early to completely evaluate this form of treatment, but encouraging reports were being received in 1941 from clinics both in the United States and abroad. The whole subject of "shock" treatment in psychiatry has been well summarized in a small manual by Jessner and Ryan.

The surgical treatment of certain mental diseases, particularly the depressions and anxiety states, by frontal lobotomy, or cutting of the fibre tracts of both frontal lobes of the brain, was extensively discussed before the section on nervous and mental diseases at the annual meeting of the American Medical association in 1941. The operation was first reported in 1936 by Moniz of Lisbon and since that date more than 100 patients have been treated by this radical method, in the United States and elsewhere. The operation was reported to have relieved patients of excessive anxiety, suicidal and homicidal tendencies and the agitation in schizophrenia. Patients after frontal lobotomy lose much of their concern with self and with their own visceral and mental activities, developing at the same time a more normal and healthy attitude toward their environment. Sufficient information was at hand in 1941 to warrant further experience with this procedure, but the operation remained of necessity an experimental one. No psychiatrist was in a position to state that this operation is or is not a worthwhile procedure. The ultimate decision must await the production of more scientific evidence.

Alcoholism.—There was a renewed interest in the subject of alcoholism, along with the investigation on drugs as a cause of mental disease. The dangers of overemphasis of the role of vitamins was stressed, as well as the feeling that all alcoholics were essentially psychoneurotic. Large groups of the population, it was pointed out, who have equally severe social and emotional difficulties, and who have a high incidence of other psychoneuroses and even psychoses, do not become alcoholics. Some investigators felt that alcoholism was part of contemporary culture in that so many social habits have been developed in response to cultural sanctions. This cannot be eliminated by legislation, and the teetotaler is equally as abnormal from the cultural standpoint as the habitual drinker. (*See* also INTOXICATION, ALCOHOLIC; NERVOUS SYSTEM.)

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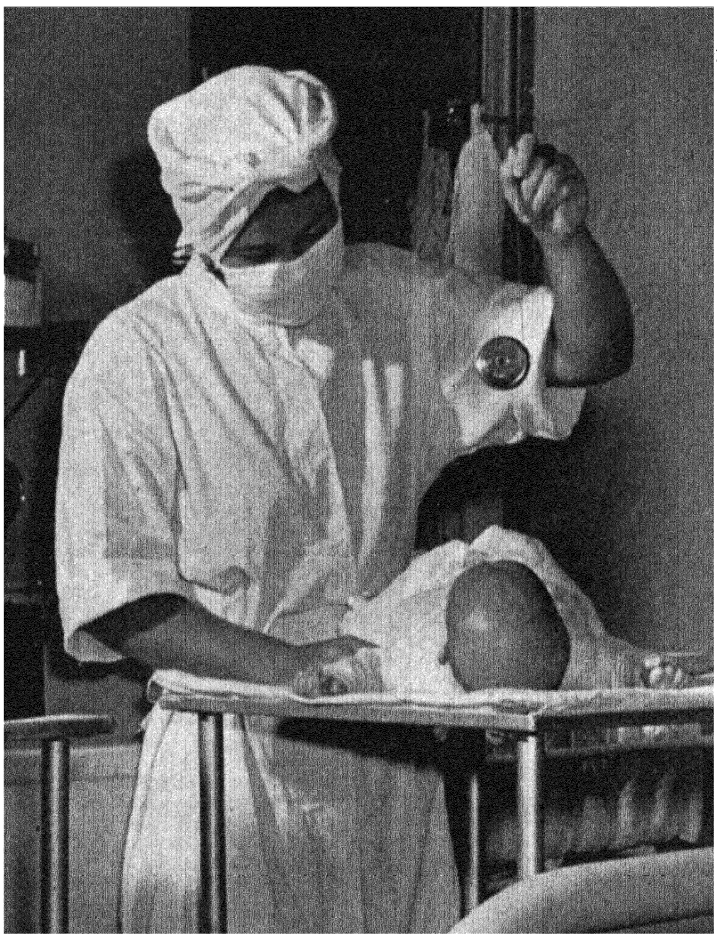
(H. R. V.)

Psychology. The impact of the war upon psychological research and upon the activities of psychologists made itself felt long before the formal declaration of war against Japan. Three areas of defense work occupied the attention of psychologists for well over a year: (1) the classification of military and government personnel, (2) technical research on problems of fatigue, sensory acuity and perceptual discrimination and (3) the study of public opinion and morale. In spite of increasing attention to these pressing problems, the usual fields of academic and applied research were still very fruitful during 1941.

War Activities.—The war activities of psychologists were coordinated through two committees, both of which made substantial contributions to scholarship and practical needs. The Emergency Committee in Psychology of the National Research council took the first step in mobilizing psychological knowledge by preparing bibliographic surveys of the many aspects of military psychology. These bibliographic articles appeared as a special



PSYCHOLOGICAL TESTS to measure the mental capacities of infants were devised in 1941 at the Cradle, nursery in Evanston, Ill. A shiny tape measure dangled above normal eight-week-old babies holds their attention; sub-normal babies of the same age ignore it

number of the *Psychological Bulletin* in June 1941 and covered the following subjects: army motor transport personnel, aviation, classification of military personnel, effects of certain drugs on mental and motor efficiency, German military psychology, morale, motivation and learning in relation to the national emergency, perception, propaganda techniques and public opinion, psychological causes of war, rehabilitation and war neuroses.

The Committee for National Morale, headed by A. U. Pope, included leading psychologists and had a special subcommittee on psychology. In Sept. 1941 it published a comprehensive survey and bibliography entitled *German Psychological Warfare*. The classified, annotated bibliography contains 561 titles and the survey shows how thoroughly the Germans have applied psychological knowledge to every phase of total warfare. The psychological section of the German general staff is organized into four divisions: (1) Technical research is concentrated in the Central Psychological laboratory of the high command, composed of 20 scientific departments. (2) The selection of personnel is carried out by 17 army and 2 naval-testing stations. (3) A special staff for the prosecution of psychological campaigns collaborates closely with the propaganda ministry, the foreign office, the Gestapo and the numerous party organizations. (4) A psychological intelligence service, closely linked to other intelligence services, is occupied with the study of foreign cultures and personalities. These four divisions thus go beyond the traditional psychological function of testing and concern themselves with principles of indoctrinating officers and men, problems of relationship between officers and men, morale, surprise, panic, the exploitation of and the defense against rumour, the analysis of the character of a foreign nation, combat psychology and propaganda techniques.

Personnel and Selection.—The growth of vocational psychology owes much to World War I, for the Army Alpha not only gave scientists a vast mass of data concerning the normal adult population but it also established the usefulness and validity of group testing as an important methodological tool. Similarly in 1941 the war situation was stimulating research in vocational selection. The need, however, was not so much for tests for the classification of men into broad categories on the basis of general intelligence as it was for techniques in measuring highly specialized aptitudes and specific personality traits. Modern mechanized warfare is warfare by technicians and specialists, and the correct appraisal of the requisite abilities and potentialities is the personnel problem of this conflict.

American procedures for the classification of military personnel differ from German procedures in keeping with the different emphases of American and German psychology. The Germans give more attention to the total personality, the Americans stress independent abilities; the Germans rely less upon verbal testing methods but are more subjective in their over-all evaluation: and finally the Germans are more interested in the characterological and qualitative side of mental testing and the Americans in the quantitative side.

Germany has probably devoted more study to the selection and training of officers and military technicians than any other nation. But significant research has been done in the U.S. on the psychology of aviation since 1939 under the auspices of the committee on selection and training of aircraft pilots of the National Research council and the Civil Aeronautics authority. In pilot and bombardier selection, as in all vocational selection, the crucial problem is one of adequate and valid criteria against which test results can be checked. For success in warfare—the ultimate but impractical criterion—have been substituted the evaluation of trained observers reporting on behaviour in standardized and relevant situations, objective scores in performance and the washout records of the training school. Interestingly enough, paper and pencil tests of personality traits have proved useful in predicting pilot success. The Germans select combat pilots on the basis of soldierly qualities of tenacity, emotional stability and ready habituation to tension and danger, but they also test specifically for the candidate's aptitude in adapting himself to his machine and in regarding the components of the plane as he does parts of his own body.

Technical Research.—The customary work of the psychological laboratory deals with many processes related to technical problems of warfare, such as sound localization, the perception of movement, visual acuity under various conditions, dark adaptation and twilight vision, fatigue and its alleviation, the effects of oxygen deprivation upon motor and sensory functions and the effects of drugs. Accordingly, the Emergency Committee in Psychology of the National Research council has formed special subcommittees to bring together research findings helpful to the military services. Moreover, technical problems as yet unsolved, are being assigned to various laboratories for further experimentation. To achieve, as have the Germans, the co-ordination and translation of ideas and findings into practical use was the real unfinished business of 1941.

Of scientific as well as practical import were the systematic studies of R. A. McFarland of the Harvard fatigue laboratory on the effects of oxygen deprivation (which occurs in altitude flying). These investigations showed that oxygen deprivation is accompanied by a decrease in visual acuity, and increase in dark-adaptation thresholds, a widening of the blind-spot retinal area and an impairment of neuromuscular co-ordination. This general loss of biological efficiency was to be expected, but the significance of the contribution lies in the exact quantitative relationship between the amount of oxygen lack and the amount of impairment.

Public Opinion and Morale.—The advances in the measurement of opinion, propaganda analysis and social psychology generally since World War I opened up new spheres of usefulness for psychologists in World War II. Thus they were assisting in propaganda analysis in the foreign political monitoring service of the federal communications commission, in surveys of public information and opinion for the office of fact and figures and in the study of military and civilian morale.

Since the start of World War II the Princeton public opinion project in collaboration with the American Institute of Public Opinion had been charting trends of opinion in relation to world events. From the outset American opinion was opposed to the axis powers but the willingness to take warlike measures was a slow development. Up to the attack upon Hawaii the majority of the American people were not in favour of a declaration of war against any axis power but they were in favour of all aid to Great Britain short of war. Noninterventionist sentiment was strongest in the middle west and among the lower income groups. The significant fact about trends in American opinion is that they have been characteristically ahead of congressional action. The figures show that the administration both in its foreign policy and in its social reforms could have moved faster than it did, as far as public opinion was concerned. The majority of the people opposed furnishing Japan with war materials for almost two years before the government shut off these supplies. Similarly, the policy of appeasement of aggressor nations and even of the Vichy government was rejected by the people before it was rejected officially.

Methodological difficulties in opinion measurement were slowly yielding to experimental attack. The problem of intensity, *i.e.*, the degree of feeling with which an individual holds an opinion, had been the greatest obstacle for the clear interpretation of all attitude studies. Experimentation on this problem was proceeding through systematic variation in the wording of questions and through the use of graphic and even pictorial scales. Another problem of method is the effect of the social status of the interviewer upon his respondents. This was solved through the employment of interviewers of social status equivalent to the responding group. The suggestive influence of the wording of questions was explored by A. Blankenship, who reported significant differences between positive and negative, personal and impersonal question forms. George Gallup, however, demonstrated that question wording exerts little influence on respondents when opinion on an issue has really crystallized. (*See* also PROPAGANDA.)

Before the outbreak of war, civilian morale was the subject of considerable investigation, largely in relation to industrial problems. In peacetime high morale was associated with high occupational level, high income, economic security, deep religious convictions, enjoyment of leisure activities, participation in organized group activities and with democratic as contrasted with autocratic group discipline. No relation was discovered between morale and educational level or between morale and health save among the aged. A negative relation was reported between morale and intelligence.

A scale for measuring morale was devised by weighting questionnaire items according to their acceptability by a high criterion group as compared with a low criterion group. The high criterion group consisted of distinguished social scientists and men in public life who were devoting considerable time to the development of national morale. The low criterion group comprised members of a settlement house known for their negativism and men found loafing during working hours on the Boston common.

In an analysis of the morale problem G. W. Allport distinguished between segmental morale, in which only part of the personality is motivated at the risk of conflict with other segments, and integral morale, in which the whole personality is integrated toward the social goal. The liabilities in the U.S. morale situation he lists as the cynicism of the deadly parallel, the ravages of the depression, the habit of destructive criticism, the taking for granted of basic liberties, the habit of expecting personal profit and the fear of factionalism. Psychological factors making for *esprit de corps*, on the other hand, are: the realism of the postdepression years, the democratic participation in group decisions and activities, the emerging sense of national unity, the American habit of intense co-operation, the hatred of tyranny and persecution, the alleviation of anxiety through a division of labour, the American sense of humour and inventiveness. Military morale has its particular problems because of conditions of danger, the reaction to killing, the regimented conformity of army life and sexual and other deprivations. I. Child urged that the negative program should be the reduction of the intensity of these conditions as far as possible. On the positive side pride in group membership, congenial relationships within the small primary group, prompt bestowal of rewards such as decorations and promotions, belief in the cause of the struggle and the development of the soldier's military skill are among the more important factors productive of high morale.

Learning and Motivation.—The mechanistic system of Hull, which seeks to reduce modifications of behaviour to the operation of logically and experimentally derived principles and postulates elementaristically conceived, was applied to social learning and imitation by N. Miller and J. Dollard. These authors reported their own experiments and observations on animals and children to show that imitation of leaders and models generalizes on the basis of reward. Reward for non-copying behaviour destroys imitation. Imitation can hasten the process of independent learning by eliciting the first correct response but handicaps independent learning in other respects. The application of the theorems of the imitation experiments to lynching and crowd behaviour, however, merely demonstrates that such occurrences can be interpreted in terms of a stimulus-response psychology and fails to add to our knowledge of these events.

Systematic exploration of the conditioned response continued as one of the important areas of laboratory experimentation. Baker's exciting discovery of subliminal conditioning in human subjects was seriously questioned as a result of the negative findings of other investigators. A number of experimenters, however, reported successful conditioning of animals under anaesthesia. These experiments are significant in their bearing on the role of consciousness in associative learning. Other work on conditioning showed that vasoconstriction can be conditioned to a compound stimulus in humans, that under repeated stimulation unconditioned reflexes yield the same type of extinction curve as conditioned reflexes, that intervals of long and short duration between conditioning trials were both more effective for learning than intervals of intermediate length and that spreading the reinforcement, or reward, over the whole interval between conditioning trials gave a progressively greater effect to the longer intervals.

Motivational studies fall into three main groupings: internal drives and their chemistry, conditions facilitating laboratory learning and social incentives and symbolic rewards. Typical of the research on internal drives is Richter's experimental evidence confirming the thesis that the organism seeks to maintain a constant internal environment. The body tries to sustain a constant temperature, a constant water balance and constant mineral, carbohydrate and fat levels even after the removal of the usual physiological means for such regulation. Any physiological imbalance thus may have a motivating effect upon the individual. In human learning Muenzinger found that obstacles placed after a choice point accelerate the learning process. Delay after the choice point has the same effect, but delay before the choice point does not. In the field of social incentives the effects of frustration were being studied extensively. For example, in one experiment it was discovered that memory for unfinished tasks was greater when the problems were presented informally than when they were presented as an intelligence test. In the latter case the ego-defensive reaction was evoked and the memory of failure repressed.

Physiological and Sensory Processes.—In the study of the sensory functions the unity of science is more and more manifest with clinicians, endocrinologists, physiologists, mathematicians and psychologists attacking the same problems with the aid of electrical techniques and refined measurements made possible by the advances in physics and biology. Progress continued in the identification of sensory mechanisms, both peripheral and central, through clinical studies of human injuries and through extirpation experiments on animals. The technique of electroencephalography, the recording of changes in the electrical potentials of the brain, was being applied more thoroughly to psychological problems. The relation between the electroencephalogram and intelligence not only was demonstrated for extreme cases but was being studied for the normal range of the population, with such factors as chronological age held constant. Some evidence existed, moreover, for regarding the electroencephalogram as a more sensitive indicator of "mental work" than physiological measures of muscle tension. The student in this specialized field in 1941 had the advantage of a text which describes the techniques, presents a fairly complete set of sample electroencephalograms and summarizes the findings in the Gibbs *Atlas of Electroencephalography*.

A contemporary development in physiological psychology was the study of the effect of vitamin deficiencies upon sensory acuity. Since the various vitamins have differential effects upon types of tissue, the loss of function accompanying a specific deficiency may establish the type of tissue mediating the function. A survey of recent work in vision with emphasis upon its neurophysiology is found in Bartley's treatise, *Vision, A Study of Its Basis*. As a result of their experiments W. Crozier and E. Wolf declared in favour of a central rather than a peripheral theory of the control of flicker discrimination. Another visual study, that of B. Crawford, reported the precise effects of field size and pattern on the change of visual sensitivity with time. The influence of the physical sciences upon psychology is evidenced both by the methods employed and by the theoretical interpretations made. For example, S. Stevens and J. Volkmann set up experiments in auditory discrimination to show that the quantum theory with its rectilinear functions describes the discriminal process for pitch and loudness.

Social Functions.—The emphasis upon the socialization process as the explanation of adult personality and social phenomena can be seen in two volumes of the Yale Institute of Human Relations, which are detailed studies of personality development in primitive cultures. Whiting's *Becoming A Kwoma* is an account of the training and sanctions in a New Guinea tribe and their effects upon the growing child. Kwoma children, for example, are not punished for deceitfulness but for obvious and frank nonconformity. The result is the development of secretiveness and arts of deception. In *Smoke From Their Fires* C. S. Ford presents the life story of a Kwakiutl chief, much of it from the lips of the chief himself. The Kwakiutl illustrate one aspect of the frustration-aggression hypothesis in the simulated bloodthirstiness of their ceremonials, which are in marked contrast with their rigorous prohibitions on physical violence and so seem a vicarious release for thwarted aggressive tendencies.

Methodology was still the important problem for the social psychologist. Lundberg's thorough revision of his *Social Research* made available the many technical advances in field studies, attitude measurement, the study of institutional behaviour and sociological indices. This volume not only is a practical handbook for the research worker but it also contributes to theory in its consideration of the assumptions and limitations in the various methods. The outstanding contribution of the year, however, came from the 450 page monograph of the Social Science Research council entitled *The Prediction of Personal Adjustment*. This volume is primarily a study of predictive methods as they apply to the field of personality. It contains a compact outline of the statistical theory of prediction, new and important sampling formulae, a method for determining the scale values of items by maximizing the internal consistency of the system, an investigation of differential systems of weighting and suggestions for the reduction of prediction items without the loss of essential information. Theoretical implications are discussed and practical applications considered.

The envisaging of complex social problems in terms of the behaviour of individuals led to many empirical investigations of the U.S. economic, political and familial institutions. *Life, Liberty and Property*, by A. W. Jones, reports a precise type of Middletown study of the class structure of an industrial town. Attitudes on corporate property were ingeniously obtained from a cross section of the population and reveal the different degrees of class consciousness in various groups. In his *Psychology of Social Movements*, H. Cantril interpreted such varied phenomena as the Oxford movement, the kingdom of Father Divine, the Townsend group and the nazi movement on the basis of social context and ego psychology. (*See* also NERVOUS SYSTEM.)

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Public Assistance: *see* RELIEF.

Public Buildings Administration: *see* FEDERAL WORKS AGENCY.

Public Health Engineering.

Air Sanitation.—A two-day symposium upon air-borne infection at the fall meeting of the American Association for the Advancement of Science, medical section, attested the growing interest in this subject. The manner of formation of droplet nuclei, by evaporation of liquid atomized during sneezing, coughing or speaking; the rate of settling of such material and its measurement by plate collection or by the air centrifuge; the longevity and virulence of air-borne pathogenic organisms and their destruction or removal by ventilation, air filters, aerosols and ultra-violet light; and both laboratory and clinical studies were discussed as a basis for a general theory of air-borne infection. The actuality and the public health significance of this mode of transmission of certain contagious diseases, especially those of the respiratory tract, appear to be well on the way to general acceptance.

War and Water Supply.—Among the realignments necessary to prevent general disorganization under war conditions are those related to the water supply. Two critical features are involved: excessive requirements of large-scale fire fighting and interruption of services by destruction of dams, pumping stations or distributing lines. Incidental possibilities include chemical poisoning and bacterial contamination, either by direct assault or through sabotage.

The complete destruction was reported of the Warsaw, Pol., water filters, constructed in 1933 and then said to be the largest plant of the rapid-sand type in Europe. The great Tirso power dam in Sardinia, Italy, was hit by bombs, according to official admission.

An anonymous writer in *Civil Engineering* (Brit.) planned an extensive emergency equipment, in standardized units, capable of being transported rapidly and installed during restoration of damaged works. The equipment, electric-driven, includes booster pumps, large-bore, lightweight steel pipes with quick-acting couplings. Electric power would be provided from an aircraft engine coupled to a dynamo. Equipment for the application of excessive doses of chlorine or hypochlorite to water mains, after partial destruction and emergency repairs, was successfully employed in London.

Civilian defense authorities in the United States were likewise taking thought of possible emergency measures. Special guarding of all vulnerable points and extra precautions in the operation of purification plants are of first concern. In general, duplication of plant and equipment is a first consideration, and in certain states along the eastern seaboard plans for intercommunication between the water systems of adjacent municipalities were being developed.

Finally, water waste assumed new importance. T. Alexander Cecil writing in *Surveyer* (Brit.) and Norman Howard in the *Engineering News-Record* (New York, N.Y.) discussed the increased normal demands due to war industries apart from the more extensive wastage resulting from bombings. Economy in the use of water and a general reduction of waste through leakage are justifiable defense measures.

Standards of Hygienic Quality in Water and Food.—In many administrative fields, including that of public health, standards of quality or performance are employed to define minimum requirements, maximum tolerances or allowable impurity. Generally such standards are expressed in direct terms of useful or undesirable constituents: as, for example, milk shall contain not less than 3.5% butterfat, or catsup shall not contain more than 0.1% benzoic acid.

In other instances, however, indirect measures or indexes are employed. Thus, when it is stated that pasteurized milk should not contain more than 30,000 bacteria per millilitre, it is recognized that the "standard" plate count is arbitrary and in no sense measures the total number of bacteria present, and, furthermore, that the bacteria reported are in all probability harmless forms such as would be drunk with impunity, and occur up to millions per millilitre, in sour milk or buttermilk.

Standards for potable water when based upon the number of bacteria present are of this indirect sort. Indexes more commonly used, as in standards for water for shellfish and the waters in which shellfish are grown, and for swimming pools and bathing places, are based upon the numbers of *E. coli*, a characteristic organism of domestic sewage and the intestinal tract. This organism has only indirect significance as an indication of danger by reason of its associations. A consideration, therefore, that underlies all such indirect standards is the numerical relation that exists between the concentration of the test organism and a harmful or undesirable concentration of the objectionable substance, sewage or, more specifically, of pathogenic organisms associated with sewage.

Rarely is it possible to establish this relation by experiment, and experience yields only indefinite limits. Artificial purification of a badly polluted domestic water supply invariably results in a substantial decrease in water-borne diseases, and pasteurization of city milk supplies has practically eliminated milk-borne epidemics, but whether treatments one-half as effective, in terms of the indirect indexes, would have given essentially the same benefits or whether more nearly perfect treatments would yield increased benefits cannot be learned from these experiences.

Hence the rule of expediency has been employed, and although frequently unrecognized, it forms the basis of most of the current standards of hygienic quality. The rule is to aim for as high a degree of quality, measured by the indirect criterion, as is feasible within reasonable cost or other existing limitations. The suitability of this rule was being challenged in several fields. The department of health of the city of New York abolished the 30-year-old system of grading milk into A and B grades, holding that the distinction, based on general sanitation and measured in terms of bacteria, had no public-health significance and that the extra cost of producing and marketing the higher grade was not justified.

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Public Health Services: *see* DIETETICS; HOSPITALS; MEDICINE; VENEREAL DISEASES.

Public Libraries: *see* AMERICAN LIBRARY ASSOCIATION; LIBRARIES.

Public Roads Administration: *see* FEDERAL WORKS AGENCY.

Public Utilities.

Speaking generally, the year 1941 was marked by progress in the United States along several lines in the public utility field. First and foremost there was great improvement in the sale of utility service, reflecting itself in the substantial advances in the gross earnings position of these industries. The growing war-born prosperity and re-employment stimulated both the consumption of utility services as consumers' goods and as producers' goods. However, the gradually rising costs of labour and material, together with the very substantial increase in public-utility taxes, left no great amount of room for improvement in the net earnings position of these industries, because the rate level either remained constant or continued its declining trend.

The growth in normal service requirements and the rapidly developing shift to wartime industrial demands was raising utilization and load factors everywhere, so that as the year 1941 progressed questions were being raised as to the adequacy of capacity for further increases in service.

The more important developments of unusual events in this general picture can be most conveniently summarized under separate headings.

Regulation.—The demand for strict regulation, both state and federal, of the utility industry continued, though the pressure was more largely exerted by the professional regulators as distinguished from consumer pressure. With the greater economic prosperity there was less insistence upon rate reductions and some slight trend was observable toward the close of the year for a rectification of rate levels to comport with the rapidly rising costs of operation. The year also saw the close of the period of inordinately low money rates and hence also a let-up in the refinancing program of the older and higher priced securities.

The Securities and Exchange commission (*q.v.*) continued to press forward in its program of corporate simplification of holding company structures. The commission's integration report for the United Gas Improvement company, generally regarded as of a yardstick character, was believed in some quarters to be designed to afford an early test of the constitutionality of the commission's procedures and objectives.

The Federal Power commission announced its intention to apply the prudent investment theory in fixing the rate base for such utilities as come within its gradually developing jurisdiction over public-utility rates in interstate commerce. The use of this rate standard together with a policy of deducting a full allowance for accrued depreciation and of making interim rate reductions was believed to presage also an early court test of rate-making policies. In this same connection there was some apprehension that there would be a clash between the federal agencies and some of the more aggressive state commissions who were, as it were, fighting rear guard actions. There was a rising interest in this general problem of federal encroachment on the domain of state regulation.

Investigations.—When the effect of the Federal Power commission's investigation into electric rates is recalled, it is of more than passing interest that the senate adopted a resolution, sponsored by Senator La Follette, directing the commission to investigate and publish a comparison of rates for gas supply in cities in excess of 50,000 population. This might have some effect upon the mooted increases in gas rates since it is known that the artificial gas industry is usually the first to feel the effects of higher fuel costs.

The Transportation board created under the Transportation act of 1940 was finally appointed and was organizing a staff of experts to study and report on the adequacy of existing rail, water and truck transportation

facilities. This board was designed to pick up the work of co-ordinating the various types of transportation facilities where that task was left by Co-ordinator Eastman when his appropriation ran out.

National Defense.—All utilities, including transportation, communication, electric, gas, central heating, water and sanitation services, were given an A10 priority rating which rendered the supply of maintenance and operating materials automatic.

The rapid increase in peak demands for power of the months of 1941 over the corresponding months of 1940 called attention to a national power situation which in certain sections, notably the southeastern states, verged on emergency. In this section the increasing demands put forth by electrochemical and other war industries, coupled with a long-continued drought which emptied reservoirs, produced a shortage which could only be met by making arrangements for emergency supplies and by power curtailment for less essential uses. Power pooling, use of submarginal sources of supply, construction of transmission lines and emergency connections with reserve sources of supply outside the area were some of the means adopted for continuing an uninterrupted and adequate supply for war industries.

A critical bottleneck in defense power was the production of turbines and generators for hydro and steam plants. Since the organizations capable of constructing large turbines were few in number and also supplied the requirements for naval and other construction, these equipment manufacturers constituted the most strategic factor in the war economy. The supply of additional power capacity, therefore, had to be scheduled in the light of this limiting factor. The Federal Power commission watched the national power supply and made forecasts of the demand and anticipated the following power capacities: 1941, 33,331,130 kw.; 1942, 36,554,410 kw.; 1943, 39,252,810 kw.; 1944, 40,265,452 kw. The only way to meet these unprecedented demands quickly was to speed up the schedule of generator installations at those public projects where reserves were available. The federal congress through appropriations therefore expedited the program of dam construction, generator installations and transmission line construction at least 3 to 5 years.

Public Power Projects.—The continuous power output of the TVA was to be increased by 387,000 kw. during 1942 and 1943. Additional capacity planned for 1943 and 1944 would add 415,000 kw., making the total of emergency installations 802,000 kw. at an estimated cost of $126,800,000. (*See* also TENNESSEE VALLEY AUTHORITY.)

In the Pacific northwest national defense industries caused an even more rapid acceleration of the installation of power units. Here the private utility industry also depended upon public sources for its future supply and hence Bonneville and Grand Coulee dams, thanks to the emerging war economy, would be producing power years ahead of the most sanguine expectations.

The Boulder canyon and other southwestern projects on the Colorado river were likewise feeling the impact of national defense. The schedule of generator installations was being speeded up; new power projects such as the Bulls Head dam site below Boulder were groomed for early construction; and surplus power originally designed for use by the Metropolitan Water District of Southern California for water pumping was diverted to the production of magnesium.

New Projects.—With the signature of the revised agreement between the United States and Canada respecting the use of the waters in the St. Lawrence river basin, the development of 900,000 kw. of power in the international section of that stream in New York was definitely contemplated and included in the $1,000,000,000 Omnibus Rivers and Harbors bill before congress. The Federal Power commission in co-operation with the power division of OPM, the TVA and other public power supply agencies worked out a construction schedule for hydroelectric and steam-electric power plants, both public and private, which was designed to keep the supply ahead of the demand. (*See* also DAMS; ELECTRICAL INDUSTRIES; LAW; RURAL ELECTRIFICATION; WATER POWER.) (M. G. G.)

Public Works Administration: *see* FEDERAL WORKS AGENCY.

Publishing (Book).

As was to be expected in wartime, technical books showed the greatest numerical increase among the various classifications issued by U.S. publishers in 1941. The number rose from 452 in 1939 to 611 in 1940 and to 741 in 1941, according to the final tabulation of the *Publishers' Weekly*. The total number of books in all classifications published in 1941 was 11,112—a decrease of about 2% from the 11,328 titles published in 1940. Macmillan again had the largest output in 1941, 434 titles. Grosset & Dunlap (305) and Harper (275) followed. There were 263 houses which published five or more books apiece. Table I gives a summary of new books and new editions in the U.S. according to international classification of subject.

Best Sellers.—By all standards of comparison, A. J. Cronin's *The Keys of the Kingdom* was the best-selling novel of 1941 in the United States. According to the *Publishers' Weekly*, 236,496 copies of the book were sold in retail stores and 234,328 book-club copies were distributed. (The ranking of best sellers is based only on bookstore sales and does not consider club sales.) Second on the fiction list was *Random Harvest*, by James Hilton (162,500), followed by *This Above All*, by Eric Knight, *The Sun Is My Undoing*, by Marguerite Steen, *For Whom the Bell Tolls*, by Ernest Hemingway (published in 1940), *Oliver Wiswell*, by Kenneth Roberts (published in 1940), and *H. M. Pulham, Esquire*, by John P. Marquand.

Table I.—*U.S. Publication of Books, 1940 and 1941*

International Classification	1940			1941			Net Change
	New Books	New Editions	Total	New Books	New Editions	Total	
Philosophy	99	11	110	107	15	122	+ 12
Religion, Theology	781	62	843	611	53	664	−179
Sociology, Economics	796	80	876	797	64	861	− 15
Law	141	61	202	150	40	190	− 12
Education (books on)	317	32	349	317	28	345	− 4
Philology	274	45	319	278	60	338	+ 19
Science	398	95	493	401	90	491	− 2
Technical books	470	141	611	559	182	741	+130
Medicine, Hygiene	326	146	472	352	140	492	+ 20
Agriculture, Gardening	108	31	139	85	25	110	− 29
Domestic Economy	70	24	94	90	36	126	+ 32
Business	344	58	402	300	90	390	− 12
Fine Arts	213	9	222	236	18	254	+ 32
Music	115	9	124	103	4	107	− 17
Games, Sports	156	26	182	125	19	144	− 38
General Literature	466	70	536	407	98	505	− 31
Poetry, Drama	671	67	738	755	68	823	+ 85
Fiction	1,221	515	1,736	1,249	462	1,711	− 25
Juvenile	852	132	984	892	111	1,003	+ 19
History	783	70	853	682	71	753	−100
Geography, Travel	262	46	308	249	23	272	− 36
Biography	569	78	647	535	64	599	− 48
Miscellaneous	83	5	88	57	14	71	− 17
Total	9,515	1,813	11,328	9,337	1,775	11,112	−216

Table II.—*British Publication of Books, 1939, 1940 and 1941*

Classification	1939		1940		1941	
	Total	Reprint and New Editions	Total	Reprints and New Editions	Total	Reprints and New Editions
Aeronautics	53	10	90	9	118	26
Annuals and Serials	104	82	69	50	54	39
Anthropology and Ethnology	41	2	14	1	20	1
Archaeology	58	3	39	1	21	—
Art and Architecture	103	15	110	6	73	8
Astronomy and Meteorology	41	3	29	3	15	2
Banking and Finance	31	6	30	8	19	5
Bibliography and Literary History	84	22	132	72	82	8
Biography and Memoirs	689	123	444	96	356	113
Botany, Horticulture and Agriculture	200	23	95	14	92	16
Calendars, Booklets and Albums	47	20	31	3	14	1
Chemistry and Physics	120	27	101	24	43	8
Children's Books and Minor Fiction	1,303	352	973	310	520	123
Classics and Translations	72	29	28	18	50	21
Dictionaries and Encyclopaedias	57	12	59	10	28	7
Directories and Guide Books	141	47	66	36	21	4
Domestic Economy	63	5	58	3	60	10
Educational	1,350	202	658	133	340	51
Engineering, Electricity and Mechanics	168	49	139	30	91	28
Essays and Belles-Lettres	298	49	252	50	112	16
Facetiae	20	3	29	6	44	10
Fiction	4,222	2,353	3,791	2,028	2,342	1,311
Geology, Mineralogy and Mining	48	9	32	5	12	3
History	387	49	279	52	199	40
Illustrated Gift Books	211	36	136	23	43	4
Law and Parliamentary	224	85	124	45	105	28
Maps and Atlases	34	8	16	3	22	5
Mathematics	54	5	32	2	35	11
Medical and Surgical	498	122	374	112	238	79
Music	59	4	49	4	33	6
Natural History, Biology and Zoology	165	27	86	14	53	9
Nautical	84	10	51	12	32	5
Naval and Military	59	9	139	10	158	19
Occultism	54	11	40	1	33	5
Oriental	337	24	144	4	76	9
Philately	17	4	14	3	4	—
Philosophy and Science	145	18	143	21	71	9
Poetry and the Drama	535	230	310	72	286	64
Politics, Political Economy and Questions of the Day	704	87	551	62	556	26
Psychology	49	8	30	5	33	8
Religion and Theology	763	92	519	48	446	65
Sociology	200	22	135	8	121	12
Sports, Games and Pastimes	156	25	100	18	57	11
Technical Handbooks	228	37	132	13	103	36
Topography, Local History and Folklore	76	7	70	7	83	12
Trade, Commerce and Industry	95	13	48	4	41	4
Travel and Adventure	311	102	209	65	112	42
Veterinary Science, Farming and Stockkeeping	33	8	24	2	37	1
Wireless	23	4	26	4	17	5
Totals	14,904	4,493	11,050	3,530	7,581	2,326

William L. Shirer's *Berlin Diary* led the nonfiction list in 1941. Published June 20, it had sold 284,407 copies, plus 281,440 book-club copies, by the end of the year. *The White Cliffs*, by Alice Duer Miller, published Sept. 16, 1940, was second, with 142,538 copies sold. *Out of the Night*, by Jan Valtin was next, followed by *Inside Latin America*, by John Gunther, *Blood, Sweat and Tears*, by Winston S. Churchill, *You Can't Do Business with Hitler*, by Douglas S. Miller, *Reading I've Liked*, edited by Clifton Fadiman, and *Reveille in Washington*, by Margaret Leech (*q.v.*).

Retail Sales.—U.S. bookdealers polled by the *Publishers' Weekly* reported an average increase of 16% in sales in 1941, as compared with sales of 1940. Despite the fact that the week of Dec. 7, 1941 was an exceedingly poor one for booksellers, December continued to show by far the largest sales of any month, because of Christmas buying; November was second best, followed by July, August and October. The slump caused by U.S. entry into World War II, however, had apparently not ended at the close of 1941.

Great Britain.—Numerically, British book publishing continued to decline in 1941, to 7,581 new titles, reprints and new editions, as compared with 11,050 in 1940. Table II, compiled by the publishers of *The Bookseller* and *Whitaker's Cumulative Book List*, gives the breakdown of British publishing by classification. Most government publications and all books and pamphlets priced at less than 6*d.* are not included in the tabulation. (*See* NEWSPAPERS AND MAGAZINES.) (J. V. Do.)

Puerto Rico. A United States insular dependency in the West Indies. Area, 3,400·6 sq.mi.; pop. (1940) 1,869,255, an increase of 21·1% over 1930 and a density of 544·2 per square mile; 30·3% urban. Whites aggregated 76·2%, Negroes 23·8%. The chief cities are San Juan, the capital (169,247); Ponce (65,182); Mayagüez (50,376); Caguas (24,377); Arecibo (22,134); Río Piedras (19,935); Guayama (16,913); Bayamón (14,596); Aguadilla (13,468). Languages: Spanish and English; religion, predominantly Roman Catholic.

Puerto Rico has a governor appointed by the president of the United States, and an elected bicameral legislature, and is represented in the United States congress by a resident commissioner. On Jan. 6, 1941, Guy J. Swope, auditor of Puerto Rico since Nov. 1939, was appointed governor, succeeding Rear Admiral William D. Leahy (resigned Nov. 1940). Governor Swope resigned July 24, and was succeeded by Rexford Guy Tugwell.

History.—During 1941, internal problems held the centre of the stage in Puerto Rico, although Caribbean defense development continued unabated, with strong economic effects.

The year started with a new governor, and a new legislature in which the Popular Democratic party, headed by Senator Luis Múñoz Marín, held a precarious control. Under the senator's leadership, his party's reform program was pressed in the legislature, with partial success. Efforts were made to implement a law (originally enacted in 1900) limiting corporation landholdings to 500 ac., essentially an attempt to encourage diversified agriculture and small holdings. Court suits, however, prevented enforcement. Acts were passed, however, which exempted from taxation real estate under $1,000 value, prohibited nepotism in government jobs, created an insular power authority similar to the Tennessee Valley authority in the United States and authorized purchase of private utility properties, and abolished the salt tax and a 2% sales tax.

Following Governor Swope's resignation in July, to accept a post in Washington, D.C., Rexford G. Tugwell, who had just been named to the chancellorship of the University of Puerto Rico, was appointed governor. Tugwell's intention to hold both positions, which was specifically legalized, aroused strong criticism both in Puerto Rico and in the United States, and in September he resigned the university post.

CREW MEMBERS of an Italian steamer at San Juan, P.R. were each sentenced to three years in prison June 24, 1941 for sabotaging their ship

Economically, the island was relatively prosperous, as defense construction absorbed part of the previously large number of unemployed, and higher sugar, coffee and tobacco prices and an increased export demand for rum stimulated economic activity. At the same time, however, rising living costs, with 11 food staples up 6% to 80% within a year, necessitated a price control act (passed in November) to stabilize food prices.

Defense and other construction activity caused a 30% increase in building permits in the first half of 1941, more than 90% of it in government projects. The most important new defense project was the beginning of a new naval base on Vieques (Crab) island, Puerto Rican territory to the east of the main island, with an authorized initial expenditure of $35,000,000.

Full appreciation of the increasing war threat was generally confined to the military and naval authorities. In October a practice blackout of the entire island was made under army direction. War department efforts to facilitate defense measures were thwarted, however, when the house of representatives rejected (Nov. 11) a bill to permit emergency declaration of martial law. In December, after outbreak of formal hostilities, preparations were made to evacuate families of military and naval personnel to the mainland.

Education.—In 1940 there were 1,733 public schools, with 286,098 enrolment. The University of Puerto Rico, with nearly 6,000 students in 1941, is an important cultural link between the Americas.

Finance.—The monetary unit is the United States dollar.

Trade and Communication.—Official policy in 1941 was to withhold publication of complete statistics. In the year ending June 30, 1940, however, imports were valued at $107,030,482, the United States supplying 93.9%. The remainder, represented chiefly petroleum products from Curaçao, jute from India, fish from Newfoundland and Canada, corn and other foodstuffs from Cuba and the Dominican Republic. The United States supplies mainly foodstuffs, textiles and miscellaneous manufactures, and takes sugar (1939–40: 62.9%), needlework (16.7%), tobacco (6.6%), rum (6.0%), fruits (1.6%), coffee (0.46%). In the calendar year 1940, imports from the United States alone were $103,972,709 in value, 23% more than in 1939; exports $83,733,274, 5.8% less than in 1939. In the first nine months of 1941, exports to the United States rose 25%, imports, 32½%.

Puerto Rico by 1941 had daily air service to the United States and southward to Panama, and frequent, regular shipping service to other parts of the West Indies and to the United States. Internal communication is by railway (387 mi.) and there was a 1,487-mi. main highway system in 1941, supplemented by local roads.

Agriculture.—Puerto Rico is essentially agricultural. Sugar is the leading product, with a 1939–40 production of 1,018,803 tons (export: 868,-

568 tons, valued at $57,328,790). Tobacco (1941: 40,000 ac.) is second, with a 1941 production of 267,500 cwt., and 1940–41 exports valued at $7,780,917, all to the United States. Fruits (mainly grapefruit, pineapple, oranges and citron) had an export value of $1,479,819 in 1940. Coffee (1940–41: 117,000 bags) is largely for domestic consumption.

In 1940, there were 51,494 work cattle, 112,585 other cattle, and 22,709 horses, mules and donkeys. Pasture land aggregated 1,005,560 acres.

Manufacturing.—Manufacturing is for domestic consumption, except needlework (1940 exports: $12,514,429), sugar processing, and cigar and cigarette making. Puerto Rico supplies half the U.S. imports of rum.

(L. W. Be.; L. C. Dea.)

Pugilism: *see* Boxing.

Pulitzer Prizes: *see* Literary Prizes: *United States;* Theatre.

Pulp Industry: *see* Paper and Pulp Industry.

Pulpstones: *see* Abrasives.

Pumice: *see* Abrasives.

Purdue University.

An institution of higher learning at Lafayette, Ind., created under the Morrill act of congress of 1862 which granted each state public lands for the establishment of a university for the teaching of "agriculture, science and the mechanical arts." Enrolment on Oct. 1, 1941, was 6,575, the largest engineering enrolment of any U.S. university or college. The faculty and staff numbered more than 1,300.

Research on the campus was expanded in agriculture, science, engineering and pharmacy in 1941, with many new projects of value in the defense program. A study of tomato diseases was begun to develop a variety resistant to Fusarium wilt, a serious problem of the tomato growing and canning industry of the state. Research in radio and television, formerly supported for 12 years or more by private industry, became a governmental project as an aid to defense and greater safety in acroplanes. Experiments with high temperature and high pressure steam, pioneered by Purdue, assumed new importance in national defense, with results applied to ship and industrial plant boilers. New basic knowledge in highway construction and maintenance of value throughout the entire north temperate zone was developed in a research program conducted by the university with finances provided by the Indiana State Highway commission.

The year 1941 saw completion of an addition to the university's airport hangar, a physics building and a high-tension laboratory. Buildings on the campus and adjoining farms in 1941 numbered 74. During 1941 a total of 43,551 persons attended the 88 conferences or short courses held on the campus, while some 2,500,000 attended the agricultural, home economics and engineering meetings held throughout the state by representatives of the university. (T. R. J.)

Pyrite or Pyrites.

World production of pyrite is about 10,000,000 metric tons annually, containing 4,300,000 tons of sulphur. Spain was formerly the leading producer, but before production had been able to recover from the effects of the Civil War, it was again reduced by the war beginning in 1939. The 958,000 tons shipped in 1940 was less than one-third of the former output. United States production in 1940 increased by 20% to 617,513 long tons; imports declined by almost the same tonnage, to 407,004 tons, so that consumption, at 1,024,517 tons, was little ahead of 1939. Four-fifths of the imports came from Spain, and one-fifth from Canada. No 1940 data were received from any of the other important producers, the latest returns being as follows: Canada 206,500 metric tons of sulphur content in 1939, Cyprus 856,800 tons, Finland 103,000 tons in 1938, France 147,000 tons, Germany 415,300 tons, Greece 217,200 tons in 1939, Italy 920,300 tons in 1938, Japan 2,000,000 tons in 1937, Norway 1,027,800 tons in 1938, Portugal 533,000 tons, Russia 978,000 tons, Sweden 191,700 tons in 1939 and Yugoslavia 128,000 tons. (G. A. Ro.)

Quakers: *see* Friends, Religious Society of.

Quebec.

One of the four original provinces which united in 1867 to form the Dominion of Canada (*q.v.*); area 594,534 sq.mi.; population (1941) 3,319,640, of whom 94% were native born and 63% were urban. Capital, Quebec (151,502). The only city with larger population is Montreal (910,002). The lieutenant governor in 1941 was Sir Eugène Fiset; the premier, Adelard Godbout.

Education.—The registration in the public schools in 1941 was 617,838; in the private schools 60,693; the number of teachers was 21,721. School attendance is not compulsory. The principal universities are the University of Montreal, a semistate institution, with 8,539 students and 748 instructors in 1941; McGill university in Montreal, with 2,726 students and 520 instructors and Laval university in Quebec city, with 1,484 students and 275 instructors.

Communication.—There were 19,050 mi. of hard-surfaced and 17,620 mi. of earth highways in 1941. The amount spent on highways in the fiscal year 1939–40 was $21,750,452. The railroad mileage was 4,836; number of telephones 311,932.

Finance.—Government receipts for the fiscal year 1939–40 were $59,153,857; expenditures $66,441,210; gross debt $294,673,099 and net debt $252,719,282.

Agriculture.—There were 6,104,000 ac. of land under cultivation in 1941, having a crop production valued at $203,429,000 and a cash value of $188,844,000.

Table I.—*Leading Agricultural Products of Quebec, 1941 and 1940*

Crop	1941	1940
Wheat, bu.	522,000	577,000
Oats, bu.	44,200,000	45,203,000
Barley, bu.	3,888,000	4,055,000
Corn, bu.	552,000	550,000
Potatoes, cwt.	13,125,000	10,737,000
Turnips, cwt.	5,975,000	6,107,000
Hay and clover, tons	5,223,000	4,017,000

Manufacturing.—The value of manufactures in 1939 was $1,045,757,585; the number of employees was 220,321 and the wages paid $223,757,767.

Table II.—*Principal Industries of Quebec, 1938 and 1937*

Industry	Value of products	
	1938	1937
Pulp and paper	$88,990,115	$107,196,316
Smelting and refining	78,954,445	69,800,390
Cotton, yarn and cloth	39,568,088	40,815,471
Tobacco, cigars and cigarettes	39,156,515	38,338,640
Women's clothing	39,113,490	40,077,126
Railway rolling stock	37,874,224	45,313,773
Men's clothing	36,702,455	28,303,883

Bibliography.—*Statistical Year Book of Quebec; Annual Report of the Provincial Secretary and Treasurer; Canada Year Book, 1941.*

(J. C. He.)

Queensland.

A state of the Australian commonwealth lying in the northeast and occupying 670,500 sq.mi.; pop. (est. Dec. 31, 1940) 1,029,613. Chief cities (pop. Dec. 31, 1939): Brisbane, cap., 326,000; Rockhampton 32,600; Townsville 31,450. Governor: Sir Leslie Orme Wilson.

History.—At the state elections held March 29, 1941, the labour government, under Forgan Smith's premiership, was returned for its fourth successive term, all the ministers being re-elected with large majorities. In April, a new political party, known as the Country Nationalist party, was formed as the result of a union between the United Australia and Country parties.

The first floating dock constructed in Australia was successfully launched from a Queensland shipyard in April.

Seasonal conditions in both the agricultural and pastoral areas were satisfactory. Sugar production was estimated at some 800,000 tons, but it seemed that shipping and storage problems might prevent the manufacture of the entire crop, although it might be required to augment production of power alcohol. The cotton harvest was estimated at 13,000 bales, compared with 8,500 bales in the 1939–40 season. The timber industry was flourishing and more than 50,000,000 super feet of hoop and bunya pine were freighted to the southern states to replace previously imported timbers.

Substantial additions to the beef storage capacity of Brisbane were made to enable 70% to 80% of the exportable surplus processed in the peak of the season to be stored. This would not only help the industry in case of shipping delays, but would enable regular monthly shipments to be made throughout the year on account of army contracts. In August the federal government announced that government factories would be built in Queensland to manufacture marine engines for the standard merchant ships which were already under construction.

Education.—In 1938: schools 1,951; scholars 194,246.

Finance.—Revenue (1940–41) £A21,410,000; expenditure (1940–41) £A21,380,000.

Communication.—In 1939: roads, motor 41,073 mi.; railways, 6,567 mi. Motor vehicles licensed (June 30, 1940), 77,037 cars and taxis; 44,689 commercial; 8,031 cycles. Wireless receiving set licences 151,110. Telephones 82,226.

Agriculture, Manufacturing, Mineral Production.—Production in 1939–40: sugar, cane 759,000 tons; wheat 6,500,000 bu.; maize 3,733,424 bu.; wool 190,000,000 lb.; gold (1939) 145,667 fine oz.; silver (1939) 3,600,000 oz.; coal 1,121,000 tons. Industry, manufacturing, 1938–39: factories 3,087; employees (average) 53,000; production, net value £A19,301,475. (W. D. Ma.)

Quicksilver: *see* Mercury.

Quidde, Ludwig (1858–1941), German pacifist, was born March 23 in Bremen. He was educated at the universities of Strasbourg and Goettingen. In 1889 he founded the *German Review of Historical Sciences*. He organized the Munich Peace society in 1894 and after 1920 was vice-president of the International Peace council. Exiled because of his pacifist activities prior to the outbreak of war in 1914, he lived in Switzerland until hostilities ceased, then returned to Germany. There he collaborated with Gustav Stresemann, who with Briand won the Nobel peace prize in 1926. The following year Quidde was awarded the Nobel peace prize. After Hitler's rise to power, he again left Germany in 1933 and remained in Switzerland until his death in Geneva, March 4.

Racing and Races: *see* Air Races; Automobile Racing; Dog Racing; Horse Racing; Track and Field Sports.

Radio. The total number of receiving sets in the United States in 1941 was estimated at 57,000,000. There were 915 licensed stations, 16 experimental stations and 52 new ones under construction. It is estimated that there were 3,500,000 receiving sets in the western hemisphere south of the United States, including 1,000,000 in Argentina, 1,000,000 in Brazil, 300,000 in Mexico, 175,000 in Cuba. Approximately 2,500,000 could hear New York city stations. (D. St.)

Radio's chief sources of advertising revenue are foods and drugs (including soaps and similar housekeepers' supplies). Because merchandise of this type was not materially affected by shortages, and, in fact, sometimes benefited immensely by increased purchasing power, the radio industry likewise could contemplate a steadier continuation of revenue in 1942 than most other advertising media. On the other hand, as in 1940, the hand of the government lay heavy on the industry. "The heart of the abuses of chain broadcasting is the network-outlet contract."

With that philosophy in mind, the Federal Communications commission (the government supervisory body under whose authority radio operates) once more attempted to limit the financial powers of the major networks, and forcibly place the industry on a newer, different plane of competition. Intramurally, this continuation of a much-hated government policy caused a good deal of pain, though the average listener, whose judgment of the industry is based on what comes out of the loud-speaker of his radio, may not have been aware of it.

Revenue and Finance.—During 1940 (1941 figures were not available) the broadcasters financially outstripped 1939, also a record year, by about 19%. Prior to all discounts, the advertising revenue of the industry divided itself as shown in Table I.

Table I.—*Radio Advertising Revenue, 1940 and 1939*

	1940	1939
Major and regional network advertising revenue	$99,000,000	$85,000,000
National "spot" advertising*	44,000,000	36,000,000
Local advertising†	54,000,000	45,000,000
	$197,000,000	$166,000,000

*Advertising by nationwide distributors placed over individual stations (as opposed to chain, or network, advertising).
†Advertising placed by local advertisers over the individual stations in their market areas.

Compilations of "net" revenue by the Federal Communications commission showed the same encouraging picture ("net" revenue means revenue from which all discounts and similar enticements have been subtracted). The industry's 1940 balance sheet, as computed by the FCC, is shown in Table II.

Table II.—*Revenue and Expenses of Radio Industry in 1940*

	1940	Pct. change over 1939
Station revenue:		
Sale of time to major and regional chains	$27,732,201	+19
Sale of time to national spot advertisers	37,140,444	+22
Sale of time to local advertisers	44,756,792	+20
Total sale of station time	$109,629,527	+20
Network revenue:		
Revenue retained after paying affiliated stations	$45,194,260	+17
Total industry time sales	$154,823,787	+19
Deduct commission to advertising agencies	20,859,018	+19
Total industry net time sales	$133,964,769	+19
Incidental revenue	13,181,948	+16
Total net industry revenues	$147,146,717	+19
Expenses:		
Total deductions	$113,850,009	+14
Broadcast Service Income (Total Revenue in Excess of Expenses)	$33,296,708	+39

In the year 1941 radio revenue appeared to have overshot the foregoing intake by a minimum of 10%. The exact figure, when issued by the government in June 1942, might prove to be higher.

That radio should, year after year, find itself able to keep up such a record-breaking performance is largely due to its successful use by advertisers whose merchandise (1) relies heavily on a "name" or trade-mark value, and (2) is in a highly competitive field, either with other trade-mark merchandise, or with "private brand" goods. Thus in 1940 nearly 90% of all network advertising revenue came from the makers of confectioneries, drugs-toiletries, foods, petroleum products, tobacco products, and soaps and housekeeping supplies. In turn, the leading manufacturers in each of these fields, despite strong competition, were large, financially successful firms who found it advisable to protect their position by continued advertising. In essence, this means that radio is chiefly supported by a handful of big advertisers from a handful of big competitive consumer industries. By way of example, here are the ten leading 1940 network advertisers with their gross time expenditures (talent not included):

Procter & Gamble	$10,999,000
Sterling Products	5,975,000
General Foods	5,887,000
Colgate-Palmolive-Peet	4,334,000
Campbell Soup	4,044,000
Liggett & Myers	3,357,000
Lever Bros.	3,171,000
General Mills	3,140,000
Brown & Williamson	2,973,000
American Home Products	2,822,000

Profit.—During 1940 (1941 figures were not available as of Jan. 1942) a total of 578 stations, representing 75% of the 765 operators, showed an excess of revenue over expenses amounting to $26,336,460. This is an average of about $45,600 per station.

On the other hand, 187 stations (25% of the total) showed a combined loss of $1,551,812, or an average of $8,300 per station. Breaking down the excess-revenue-over-expenses picture, we get the following tabulation.

	Excess of revenue over expenses
Networks	$8,512,060
31 network-operated stations	5,661,039
734 other stations	19,123,609
Total	$33,296,708

As against 1939, expenses for the entire industry increased $13,806,000, whereas excess revenue increased $9,459,000. In short, expenses increased by a greater amount than excess revenue; but the rate (per cent) of excess revenue increased much faster than the rate of expense, the former being 39% and the latter being only 14%.

A further breakdown of 1940 revenue by individual stations will serve to illustrate, in more detailed form, the incidence of profit and loss (*see* Table III).

Table III.—*Incidence of Profit and Loss in 765 U.S. Radio Stations in 1940*

Revenue Group	No. of Stations	Total Expenses	Excess Revenue Over Expenses
$1,000,000 or more	8	$ 9,279,585	$4,587,798
500,000 to $1,000,000	42	19,959,416	9,336,703
250,000 to 500,000	69	16,914,938	5,968,440
225,000 to 250,000	14	2,363,876	868,963
200,000 to 225,000	11	1,955,533	302,405
175,000 to 200,000	23	3,048,848	1,049,297
150,000 to 175,000	22	3,326,200	168,305
125,000 to 150,000	27	2,826,691	771,294
100,000 to 125,000	41	3,689,366	693,958
75,000 to 100,000	65	5,078,447	573,709
50,000 to 75,000	101	5,666,563	475,842
25,000 to 50,000	154	5,648,346	102,306
15,000 to 25,000	105	2,195,059	62,133*
1 to 15,000	83	853,007	52,239*
	765	$82,807,375	$24,784,648

*Deficit.

After 1939 the Federal Communications commission greatly extended its studies on the origin of loss in order to help the weaker financial elements in the industry to improve their position. In this connection it is interesting to note that of the 187 stations which lost money in 1940, 45% appeared to be chronic money-losers, having shown losses for the years 1938 and 1939 as well. Another 14% consisted of new stations, in operation less than a full year. The high percentage of chronic losers would undoubtedly be examined carefully in the future to determine whether losses were due to (1) competition, (2) market, (3) power, or perhaps (4) management.

Industry Assets.—The tangible property of the entire industry in 1940 had a composition as shown in Table IV.

Table IV.—*Composition of Tangible Property of Radio Industry in 1940*

	765 stations	Major networks	Regional networks	Total
Original cost	$57,811,991	$11,920,128	$1,184,193	$70,916,312
Depreciated cost	31,978,281	7,373,996	702,835	40,055,112

Programming.—*Network Commercial Programs.*—The ten most popular network programs as of Dec. 1[1] were:

1941	*1940*
1. Chase & Sanborn Program (Edgar Bergen)	1. Jack Benny
2. Jack Benny	2. Chase & Sanborn Program
3. Fibber McGee & Molly	3. Fibber McGee & Molly
4. Lux Radio Theatre	4. Lux Radio Theatre
5. Aldrich Family	5. Bob Hope
6. Bob Hope	6. Kate Smith Hour
7. Maxwell House Coffee Time	7. Major Bowes
8. Walter Winchell	8. Kay Kyser
9. Kate Smith Hour	9. Aldrich Family
10. Fitch Bandwagon / Kraft Music Hall	10. One Man's Family

[1] These ratings are supplied through the courtesy of A. W. Lehman, manager of the Cooperative Analysis of Broadcasting, and are copyrighted by the latter. The CAB is the industry's major fact-finding body in the field of programming.

Changes in network programming have been relatively minor in the past several years, barring only the fact that dramatic programs have greatly increased while the expensive "variety" programs have diminished in numbers (though not in their ability to attract an audience). This comparative stability in programming is a natural historical growth. Radio passed by 1941 the period of experimentation. All the feasible alternatives in programming were explored. An era of relative quiet was in progress.

Network Programs by Types.—As mentioned above, the only noteworthy change in network programs was the increase in dramatic programs. The general composition of network evening programming may readily be ascertained from Table V.

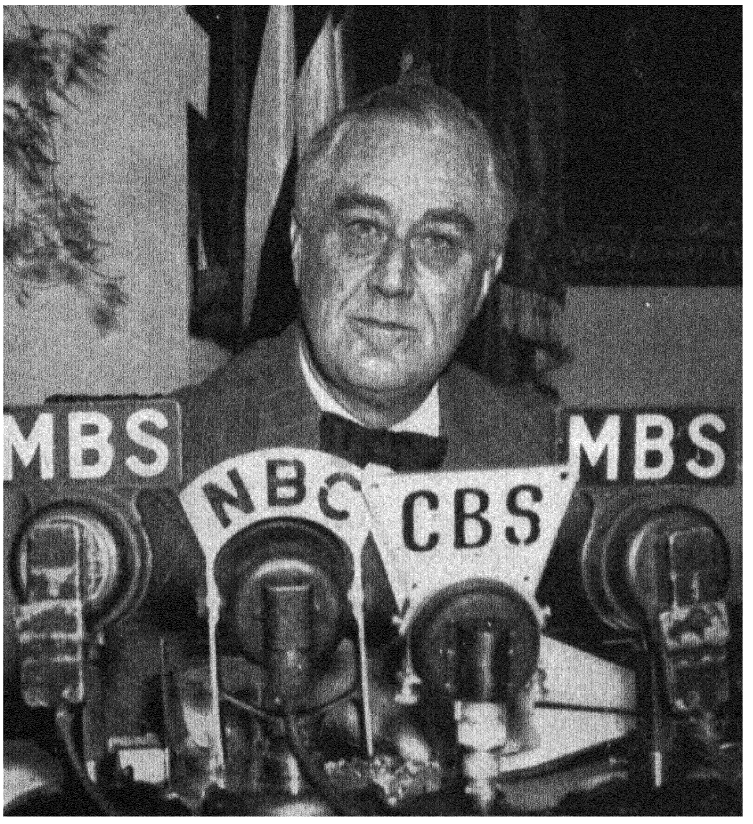
Table V.—*General Composition of Network Evening Programs*

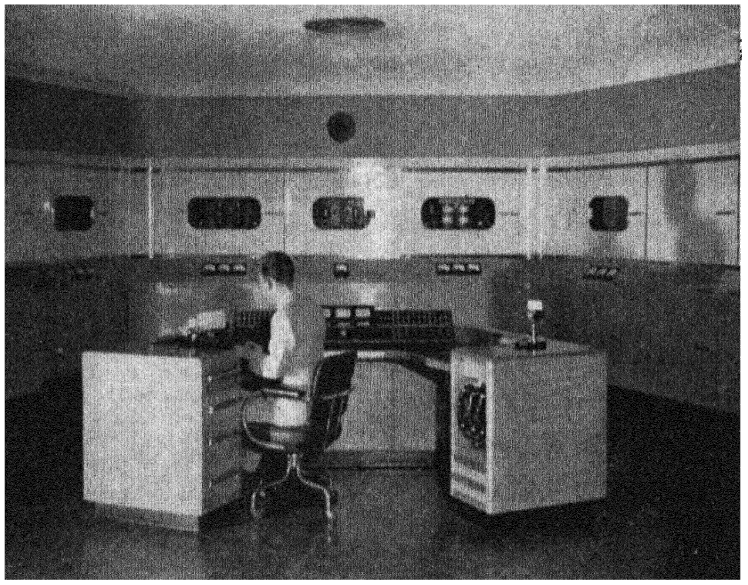
Type of program	1940–41		1939–40	
	No. of programs	% of time on the air	No. of programs	% of time on the air
Drama, serial drama	40	28	30	24.3
Audience participation	28	21.6	20	15.9
Variety	24	18.9	33	26.3
Commentators, news and talks	14	12.3	9	10.0
Popular music	13	11.1	15	10.5
Familiar music	7	4.9	7	5.3
Classical, semiclassical music	3	3.2	3	4.2

Data supplied by the Cooperative Analysis of Broadcasting. The 1939–40 percentage figures are slightly low due to a different grouping of programs at that time, but not enough to cause any serious distortion.

Daytime network commercial programs continued to show an immense preponderance of serial dramas and need not be broken into categories for that reason. The reign of the serial drama had been a long one, and although it had frequently been predicted that these programs—the equivalent of the comic strips in news-

AN ESTIMATED WORLD AUDIENCE of 90,000,000 people—largest in the history of broadcasting to that date—listened to President Roosevelt Dec. 9, 1941 as he told the nation, "we are going to win the war and . . . the peace that follows."





CONTROL ROOM of the WABC transmitter, in Long Island sound, New York

papers—would in due time "wear out," the end was far from being in sight.

Talent Costs.—According to data compiled by *Variety*, the aggregate talent costs (including certain production expenses) of network commercial programs in the 1940–41 season were in the neighbourhood of $30,000,000 for nighttime programs and $7,500,000 for daytime programs. The Federal Communications commission meantime reported that the total programming expenses of the industry in 1940 were $45,500,000. The *Variety* figure and the FCC figure contain a slight overlap, but on the whole are complementary. A total talent-production cost estimate for the industry could well be placed at $80,000,000 or over.

Individual Station Programming.—As in the past, individual stations relied heavily on news, music and sports. So successful had this formula become that it got network imitation. Trade advertisements by the Mutual Broadcasting system stressed the fact that it, too, was basing its policies on that stalwart trio: music, news, sports.

Programs During the War.—Although the broadcasters had a dress rehearsal for the 1941 phase of the war via their experiences in Europe after 1939, additional cautions and mild censorships were mandatory. This was especially true because the war had been creating record audiences at intervals when important national events were transpiring. For instance, President Roosevelt's speech to congress asking for a declaration of war (noon, Dec. 8) commanded the greatest daytime listening audience ever assembled. Almost 66% of all radio homes were reported by the Cooperative Analysis of Broadcasting as tuned to the president. The following evening the president set a new nighttime listening record with a C.A.B. rating of 83%.

Censorship of radio was officially in the hands of J. Harold Ryan, who acted as assistant to Byron Price, director of censorship. Additionally, radio stations had to obey the war regulations of their localities, and special army-navy orders.

In a manual issued by the National Association of Broadcasters (industry trade association) the following items were listed as not permissible in broadcasts:

1. Rumour and unconfirmed reports.
2. War production figures (unless officially released).
3. Movement of naval vessels.
4. News of troop movements (unless officially released).
5. Location of vessels under construction.
6. Figures on Selective Service enrolments and inductions.
7. Weather conditions, unless received from local weather bureau.
8. Imperatives such as "Attention all men! Report to . . ."
9. Overestimations of U. S. strength or underestimations of enemy strength.
10. Commercial announcements which may be confused with genuine news.
11. Sound effects which may be confused with air-raid alarms.
12. Long lists of casualties.
13. "Master-minding" or "second guessing" of military strategy.
14. Any verbal aid or comfort to the enemy.
15. Location of plants engaged in war production (unless approved by the government).

While these rules were an unofficial guide, they nonetheless carefully reflected the wishes of censors and military officials. The N.A.B. also advised stations that they should continue their foreign language broadcasts until notice from the government to the contrary. The object of continuing these programs was to bolster the morale of those loyal Americans who happened to be more familiar with a foreign tongue than with their adopted language. On the whole, the broadcasters did a conscientious job of aiding morale and quashing hysteria in 1941.

Radio v. Government. *The Network "Monopoly" Investigation.*—Since 1937 the Federal Communications commission (*q.v.*) had the major networks under investigation on the ground that they constituted a "monopoly" in the field of chain broadcasting. On June 12, 1940, the FCC brought forth a report on the lengthy investigation, and therein ringingly condemned the networks—especially the National Broadcasting company and the Columbia Broadcasting system—for keeping such an alleged iron grip on their affiliated stations that competition was virtually squelched.

In 1941 this condemnation was carried a step farther. On May 2 a series of rules was issued to break up the so-called "monopoly." These rules specified that (1) a station may not exclusively affiliate itself with any one major network; (2) it may not have a network contract which prevents other stations in the same area from accepting programs of the network; (3) it may not enter into contracts with a network for longer than one year; (4) it may not option (or promise) a network time-periods unless the network really intends to use them; (5) it may not surrender to the network the right to control or reject programs; (6) a network may not own more than one station in any single area, or in areas where facilities are so few as to give the network complete domination; (7) one network may not operate more than one hookup—a clause obviously aimed at NBC which controls both the Red and Blue networks; and (8) a station may not allow a network to fix its rates.

Except for certain minor objections, the Mutual Broadcasting system—younger and smaller than NBC and CBS—heartily agreed with the commission on the content of the rules, and thus split the industry into several factions. NBC and CBS, on the other hand, protested that the rules were a "death sentence" and would "kill" chain broadcasting.

There followed a congressional investigation, during which time the rules were held in abeyance. Although this congressional gesture never progressed into anything tangible, it patently did inform the FCC that the rules were too stringent and would have to be amended. So in October a new version was brought forth, somewhat milder in content. Neither NBC nor CBS was asked to dispose of any of its stations, and no forced sale of one of NBC's two networks was demanded. However, exclusive network affiliation was still prohibited, and options (that is, a network's right to demand time from affiliated stations) were limited to an absolute minimum.

Again the Mutual Broadcasting system expressed itself as pleased over the fairness of the rules, and again NBC and CBS claimed they were death sentences. Therefore, both of the latter networks asked for a court injunction to stop the FCC from enforcing its edicts. Hearings on the injunction pleas had not yet (Jan. 1, 1942) been held, and until there was some official interpretation of FCC power, the rules would again be held in abeyance.

It seemed (Jan. 1, 1942), however, that neither NBC nor CBS could hope to win a complete victory over the FCC. That the networks recognized their plight was evident from the fact that both sold their profitable artists' bureaus—evidently as a gesture of appeasement, for the FCC passed no rules against artists' bureaus, although it did informally condemn network ownership

of them. Additionally, NBC was in the process of making a separate corporation of the Blue network so that it would not overlap into the personnel and property of the bigger Red network.

While it was possible that the pending injunction plea might halt the commission, or tone down its demands, this breathing spell would be short-lived at best. For the commission in the interim turned all its "antimonopoly" materials over to the department of justice, which in turn filed a suit under the Sherman act against NBC and CBS.

Launched in Chicago on the very last day of 1941, this action charged that the two networks worked various restraints of trade in commercial network broadcasting, and asked that the following changes be made: (1) Disposition by NBC of one of its two networks; (2) disposition by CBS and NBC of stations owned in markets which have very little competition; (3) nonexclusive contracts between networks and stations, and limitations on option-time; (4) limitation of network-affiliate contracts to two years' duration; (5) alleviation of certain alleged injustices by NBC and CBS against transcription companies.

The Mutual Broadcasting system was not mentioned in the suit, and in fact indicated that it would institute a $10,000,000 suit of its own against NBC on the claim that NBC wilfully stifled Mutual's growth.

All in all, this turn of events presaged difficult days. Obviously the department of justice' action was aimed toward a consent-decree finish, and unless the networks agreed to such a consent-decree, they must undertake a long, costly, legal proceeding whose outcome naturally would be dubious.

Other FCC Investigations.—On the heels of its campaign to stamp out the alleged domination of the major networks, the commission launched two additional investigations having to do with possible monopoly. One (begun in midsummer) was a probe to see "whether or not the joint control of newspapers and radio broadcasting stations tends to result in an impairment of radio service."

Between a quarter and a third of the nation's radio stations are jointly owned with newspapers. The other probe concerned the multiple ownership of stations in the same community by a single person or corporation.

Although hearings were held on both topics, nothing tangible resulted up to Jan. 1, 1942. Trade opinion was that the commission was not on very safe ground in these latest investigations and might drop them, or issue only very mild rules. The newspaper-radio hearings, as an example, began inauspiciously for the commission when the latter, through some inexplicable slip-up, presented data so easily identified as in serious error that it had to withdraw to revamp its offense.

Musical Property.—The radio industry in 1940 began a struggle with the American Society of Composers, Authors and Publishers (ASCAP) over licence-fee payments for the use of ASCAP's copyrighted popular music. Under existing contracts, individual stations had paid ASCAP 5% of their receipts, but the networks had paid nothing on the moneys retained by them from chain advertising. Hence ASCAP demanded that as of Jan. 1, 1941, individual stations pay from 3% to 5% (depending on size), while the hitherto nonpaying networks would be charged 7½%.

This contract was flatly turned down by virtually the entire industry, and on the first day of 1941 ASCAP music was banned from the air.

What the warring factions of course knew from the beginning of their feud was that public opinion would be the decisive factor in determining the winner. ASCAP obviously hoped for a loud clamour over the banning of Victor Herbert, Irving Berlin and other well known music. The broadcasters, for their part, put their faith in "public domain" music (out-of-copyright tunes), and on works of Broadcast Music, Inc. (a music publishing venture supported and founded by the radio industry). When the public evidenced little more than apathy over the feud, ASCAP's cause was doomed.

By May it had brought down its original steep demands to the point where it granted the Mutual Broadcasting system a licence for 3%. Six months later it came to terms with NBC and CBS, granting them licences for 2¾% (Mutual's contract simultaneously was revised downward to meet this lower figure). Individual stations were offered a variety of licensing plans—all of them cheaper than the terms of the old contract.

In short, ASCAP not only failed to better its revenue as against the old radio contract—it even failed to do as well. Happily, however, the settlement between the warring factions contained one clause heartily approved by everybody: The new contract would run until Jan. 1, 1949, and on Jan. 1, 1950 (barring another financial squabble), would automatically renew itself for nine years.

In short, one of radio's oldest, most persistent headaches at last succumbed to a contractual aspirin.

Employment.—Once more radio pay rolls reflected the high compensation standards to which the industry had traditionally adhered. Latest data (from a sample for the week of Oct. 13, 1940) is shown in Table VI.

Table VI.—*Employment Figures of the U.S. Radio Industry*

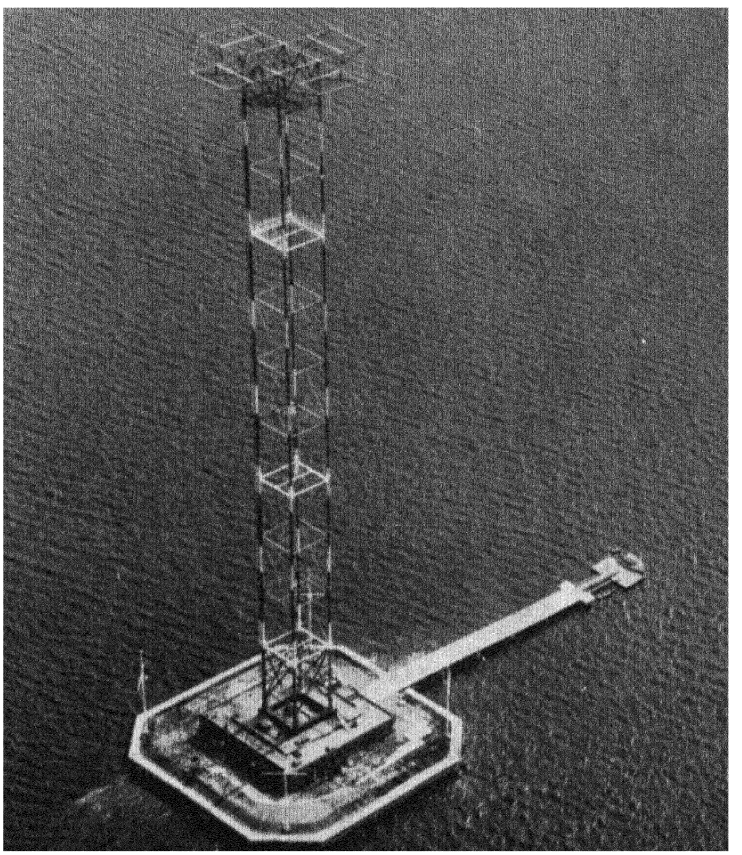
	1940	1939
Full-time employees	21,646	18,359
Average weekly compensation	$46.95	$45.20
Part-time employees	4,007	4,377
Average weekly compensation	$27.49	$23.55

Union difficulties, as in 1940, remained at a minimum. While minor flare-ups took place on isolated occasions, no serious controversies occurred.

Television and Frequency Modulation.—The progress of these two arts, from the technical standpoint, is discussed elsewhere in this article and in TELEVISION. It is worth noting here, however, that in 1941 both took their place alongside standard radio broadcasting as commercial media. The significance of this development, of course, was that the new money provided by advertising would hasten the value of FM and television as purveyors of entertainment and information.

With respect to television, the decision of the Federal Communications commission to allow commercialization was a reversal of an earlier attitude to keep the art purely on an experimental basis. But in May the commission ruled that the "green light" would be given as of July 1. Resultantly, on that date NBC staged the first commercial television broadcasts in his-

THE TRANSMITTER for WABC, key station of the Columbia Broadcasting system, is located on a man-made island in Long Island sound, a mile off New Rochelle, N.Y. The 50,000-watt signals from the 410-ft. tower first went on the air Oct. 18, 1941



tory. The sponsors included Procter & Gamble, Lever Bros., Bulova, Missouri Pacific railway and Sun Oil Co. From these pioneer advertising attempts, it was apparent that advertisers envision the new art—from the commercial standpoint—as best suited to (1) demonstrating their products and (2) showing the audience what the package or container looks like.

With the advent of war, and restrictions on the use of metal, television suffered a setback. Both NBC and CBS, however, continued to broadcast programs on a regular basis (CBS was experimenting with colour-television). What prompted this continuation was the feeling that in postwar days television might turn out to be as important a new industry as standard broadcasting became after the end of World War I. (*See* also TELEVISION.)

Frequency modulation, cheaper to put into the hands of both the broadcaster and the listener, would undoubtedly suffer from the war, too, but it had a "head start" by the time the gloomy period set in. The first commercial FM transmitter went on the air March 1, although prior to that time there had been 18 experimental stations. By mid-December, 24 commercial stations were in operation, and a total of 62 authorizations had been made by the FCC.

Concurrently, set ownership exhibited an immense rise. Twenty radio set manufacturers began supplying the FM market with receivers, ranging from table models to highly expensive "combinations" (combined FM-phonograph sets, or combined FM-AM receivers). Estimates indicated that almost 250,000 sets were in use as of Jan. 1, 1942. Twelve months before, the figure was 15,000.

It is difficult to indicate the exact geographic distribution of sets, inasmuch as the high rate of sales keeps changing the picture. However, figures pertinent to Nov. 15, 1941, show the more important FM cities, from the standpoint of set ownership, as given in Table VII.

Table VII.—*FM Sets in Various Cities and Areas, Nov. 15, 1941*

City or area	Set owners	City or area	Set owners
New York city	30,000	Pittsburgh	3,500
Chicago	15,000	Hartford	2,700
New England	10,000	Albany-Schenectady	2,500
Detroit	6,000	Cleveland	2,000
Los Angeles	6,000	San Francisco	1,700
Philadelphia	5,000	Kansas City	1,600
Milwaukee	3,800	St. Louis	1,600

FM's great virtue is that it is practically "staticless," and represents the ultimate in high-fidelity transmission and reception. And like the *video* art, FM is earmarked as a postwar industrial "cushion," and a candidate for widespread public acceptance.

Radio in the Western Hemisphere.—*North American Regional Broadcasting Agreement.*—On March 29, 1941, the painstakingly planned agreement governing the allocation of radio facilities among the United States, Canada, Cuba and Mexico went into effect. The purpose of this pact was to minimize radio interference among the four nations via the orderly granting of wave lengths and power. To comply with the agreement's stipulations, 802 of the 893 U.S. stations had to change their place "on the dial." But this was accomplished with a minimum of confusion inasmuch as the industry had carefully informed the public of the coming switch-over.

Superpower.—It is interesting to note that the agreement allowed the use of power in excess of 50,000 watts for a certain class of station, but the FCC in 1941 failed to assign such "super-wattage" to any commercial broadcaster. The reason for this reluctance, of course, was that the FCC did not wish smaller stations to complain that they were being forced to compete with giants. On the other hand, it seemed probable that the FCC might change its attitude in the not too far distant future. There were two reasons: (1) national defense, and (2) high-wattage stations might provide uncomfortable competition for the major networks which, in the eyes of the FCC, had far too little competition in the past.

U.S.-Latin-American Broadcasts.—There was a vigorous trend toward "internationalizing" U.S. networks in 1941, particularly with respect to the western hemisphere. Both NBC and CBS enlarged and perfected hookups which covered all the nations in the western half of the world. Similarly, the Crosley corporation (of Cincinnati) set up a regional network to cover certain portions of the Latin-American market.

International networks operated thus: A powerful U.S. short-wave station "beams" programs to the other western hemisphere nations; there, affiliated stations "pick up" the short-wave emissions and rebroadcast them locally via long-wave. NBC, CBS and Crosley sell time over their networks in a manner comparable to the sale of time over the regular U.S. networks. (The CBS Latin-American network as of Jan. 1, 1942, was not completely in operation; certain tests were still being made.)

Advertisers who did not wish to buy an entire hookup, might buy only the short-wave facilities of the American unit, and rely on listeners in the Latin Americas to pick up the U.S. beam. Single-station time sales of this kind were being made not only by NBC and Crosley, but also by General Electric and Westinghouse (both of which own short-wave units, but not networks).

Aside from their commercial aspects, however, these attempts at welding the solidarity of the western hemisphere had a high good will value and thus were favoured by the government. Nor was the effort unilateral. Many Latin-American broadcasts were, in turn, picked up and rebroadcast to U.S. listeners as a reciprocal feature.

With government aid (financial and cultural) this type of broadcasting apparently was destined for a favourable future. In postwar days its value would be the creation of a great market for western hemisphere commercial interchange. During the war it would keep all the sister republics in touch with each other. And finally, the interchange of programs would serve to maximize the quality of broadcasting over the greatest democratic land area in the world. (*See* also ADVERTISING; AIRPORTS AND FLYING FIELDS; CIVIL LIBERTIES.) (E. A. GD.)

Other Scientific Developments.—One of the scientific accomplishments of 1940, the small and economical high-efficiency tubes that were the basis of the camera-size or "personal" radio receiver, had great recognition during 1941. Not only did more than 500,000 of these little battery-operated portable sets go into use, but the same principles were applied in the military field. The army in 1941 had portable, battery-operated radio telephone transmitters and receivers which a soldier could carry without difficulty and use for two-way communication while on the march or on scouting duty. This so-called "walkie-talkie" outfit proved its value. The little, easily carried broadcast receiver from which it was derived had also a wartime value, for householders began to realize that such receivers provided the mechanism for picking up broadcast air raid warnings or other instructions even though the central power supply stations should be put out of action.

Another important wartime development was the "Radar," a new application of newly developed vacuum tubes which were capable of generating surprisingly large amounts of ultrahigh frequency power. The British disclosed in the press that this device was exceedingly effective in the detection and location of enemy planes, and the United States was understood to have adopted it also as an important item in air defense.

The year 1941 saw striking improvements in direction-finding apparatus, used for the precise location of radio transmitters. Since their utility was principally in the military field, little more can be said about them. Velocity modulation tubes and small vacuum tubes for the generation of intense pulses of very high frequency power were further developed and applied.

Facsimile.—Facsimile, the radio printing press which transmits text or pictures by wire or over the air and, at the receiving point, provides an exact black-and-white copy on paper, was further improved and applied. The system was in commercial use for the transmission of radio messages between Los Angeles, Calif., and New York, N.Y., in addition to providing a number of military services. Its application in the home broadcasting field, while technically feasible, was expected to be postponed for the duration.

FM and Air Raids.—One unexpected advantage of FM broadcasting was brought out by the war. It was known that (particularly at night) the waves of a high-power standard broadcasting station might be picked up by an enemy bomber some thousands of miles away and used as a "homing" beacon to guide the plane to its objective. Therefore provision was made to close down standard broadcast stations in time of threatened air attack, although the closing of those stations deprived the authorities of their means for instantaneous mass communication with the public. Inasmuch as the range of the FM stations was in 1941 normally less than 100 mi., day or night, and probably not more than a few times that when received by a high-flying plane, it seemed safe to leave the FM transmitters on the air until the enemy planes were very much closer in. Thus an effective means of issuing instructions to the air and fire wardens, as well as the people in general, might be preserved.

Electron Microscope.—The electron microscope, developed from radio practice by Dr. Zworykin and his associates, had remarkable recognition. About 16 of these instruments were in use in various laboratories, where their high resolving power was making possible scientific work heretofore blocked by the limited magnification of the optical microscope, only about 1/50 as powerful as this new tool. As an example, Drs. Chambers and Henle, of the University of Pennsylvania, announced the isolation and photographing of the influenza virus and the subsequent production of a new and more effective influenza vaccine. Industrial applications of the electron microscope were perhaps of equal significance.

With the beginnings of the great new research laboratories of the Bell system at Summit, N.J., and of the Radio Corporation of America, at Princeton, N.J., 1942 should see still further and even more striking scientific developments of radio. (*See* also DEFENSE COMMUNICATIONS BOARD; FEDERAL COMMUNICATIONS COMMISSION.) (J. V. L. H.)

Great Britain.—The British Broadcasting corporation carried on an uninterrupted service through 1941, in spite of enemy action. The audience for the home service sometimes amounted to more than 23,000,000 listeners for a single broadcast.

The main purpose of the BBC was to speed the war effort by supplying the latest news, and supplementing it with eyewitness accounts, official explanations of projected measures, useful talks about health, food and civil defense and messages to and from men on active service. The BBC was not only often first with the news, but, because its news was trusted, had a powerful effect abroad. For instance, its straight-from-the-shoulder talks were a principal factor in the fall of the Persian shah and the flight of the nazis from Iran.

The program for the forces increased to 17 hr. daily. It carried many items such as "Radio Reconnaissance" discussing the progress and meaning of the war; its "Any Questions?" with extemporary answers, enjoyed great popularity. The resident "Brains Trust" (C. E. M. Joad, Julian Huxley and Commander Campbell, with compère Donald MacCullough) became household names.

Thirty programs weekly were directed to different branches of the services. Examples were: "News from India," "Greetings from Cairo," "The Blue Peter," "Hello, Diggers!"—linking men in the war zones with all parts of the empire. Personal messages between children evacuated overseas and their parents gave great pleasure. Industrial workers, from their factories, contributed programs of their own, like "Works Wonders," and to them, at their benches and in their rest time, the BBC brought entertainment.

The oversea services expanded greatly. There were broadcasts in 43 languages, including Chinese, Thai, Malay, Bengali and Arabic. Until Russia was attacked, the BBC alone represented the Allied cause in Europe. Exiled governments had their regular place in these broadcasts. The oversea service comprised an empire service in English, daily, for 23 hr., reaching all parts of the world in the evening (local time). Empire and eastern languages were alternative to English. Parallel was the European service, covering 25 program hours daily. Two hours were devoted to the near east and four to Latin America. Daily programs were addressed to German and Italian soldiers, to Austria and to German women.

The prime minister, Winston Churchill, made notable and challenging broadcasts, of which the firm acceptance of Germany's challenge on the day of the invasion of Russia was outstanding. This speech, widely translated, was rebroadcast in Russian. The premier also spoke vividly of his ocean

meeting with Pres. Roosevelt and the resulting Atlantic charter.

The queen broadcast national thanks to the women of America. The kings of Norway and Yugoslavia, the queen of Holland, Crown Prince Olaf, Prince Bernhard and the Princess Tsahai of Ethiopia were other royal broadcasters.

Wendell Willkie, Robert Gordon Menzies, John Winant, Drs. Quo Tai-Chi and Wellington Koo, successive Chinese ambassadors, Harry Hopkins, I. Mikhailovich Maisky, Raymond Gram Swing, Dorothy Thompson and Alexander Woollcott were among those who were heard on the air. Writers included T. S. Eliot, Robert Sherwood, Desmond MacCarthy, J. B. Priestley, Quentin Reynolds and A. P. Herbert, who were widely heard in "postscripts" to the Sunday evening news bulletin. Service speakers commanding great attention included Air Marshal Sir Philip Joubert de la Ferte, Commander Kimmins, Air Commodore Goddard and Major General Collins.

Separate medium wave lengths for the forces and the European services were introduced. Short-wave reception for the British Isles and ships at sea was first used, home and forces programs being each made available on the 6 megacycle (49 m.) band.

The BBC symphony orchestra and the other regular combinations continued to make music under difficult conditions. Dramatic features reflected the progress of the war, often reconstructing tales of heroism and endurance from the services and from the civilian front as well. In news talks too, service men and others who had played an active part told simply, but with great effect, of remarkable experiences. The hunt for the "Bismarck," the various escapes from occupied Europe, the sufferings of men at sea in bringing food and munitions to Britain, the constant peril from fire and bomb in the great cities, all these were recounted at the microphone.

Meanwhile, the "show went on." Variety programs, amongst them such diverse features as "Hi, Gang!" and "Everybody's Scrapbook" contributed to light entertainment. A puzzle program drew 500,000 entries, and in nine months produced £50,000 for the Red Cross. "Good Cause," appeals were made by Mrs. Churchill, Madame Chiang Kai-shek, Lord Trenchard, Anna Neagle and others.

The BBC's board of governors, reduced to two members when war began, was increased to its full peacetime strength of seven. The BBC worked to the direction of the ministry of information in all matters affecting the war effort until the autumn, when a new government organization for political warfare became responsible for broadcasts to enemy and enemy-occupied territories. The governors, however, remained trustees to the public to see that the standards and traditions, established by the BBC over many years, were maintained. (*See* also ADVERTISING.)

Radiology.

Radioactive Isotopes.—The radioactive isotope of any element is chemically identical with the stable form of the element. Wherever it is deposited it undergoes radioactive disintegration and in so doing it irradiates the cells containing it. If cells of a particular type of tumour should concentrate several times as much of some radioactive substance as the normal tissues, then in its decay this substance would irradiate the tumour cells correspondingly more strongly than the rest of the body. If this differential absorption between the two were great enough, a clinically effective dose of radiation could be thus applied to the diseased cells without damaging the normal structures or the patient as a whole.

Tracer Studies.—Very small amounts of the material are administered, to find out how it is localized in the various tissues and organs. This results in the establishment of differential absorption ratios: $\frac{\text{amount of isotope administered per gram of tissue}}{\text{amount of isotope administered per gram of body weight.}}$ If this is less than three it is probable that the substance will be of little use; if it is greater than four or five, the outlook is encouraging.

Radioactive phosphorus is concentrated in the bone, liver and spleen of normal persons. In leucaemic patients it deposits with a favourable absorption ratio in white blood cells, bone marrow and any tissues infiltrated with leucaemic cells. In carcinoma of the breast it does not appear to concentrate in the primary lesion, but does in both normal and metastatic lymph nodes. In osteogenic sarcoma it concentrates in the primary tumour to a much greater extent than in normal bone. In lymphosarcoma the differential absorption ratio in diseased lymph nodes is high. Hence the administration of radiophosphorus in any of these conditions might be expected to be of value in treatment. Radioactive strontium is found to concentrate almost entirely in the growing parts of bone, suggesting its use in rapidly growing bone tumours. Radioactive iodine deposits almost entirely in the thyroid gland. Thyroids containing nontoxic goitres store almost twice as much as normal glands; those containing toxic goitres very much more. However elimination in the latter also proceeds very much more rapidly.

Estimates of Possible Radiation Dosage.—When the actual amount of isotope deposited per gram of any tissue can be determined, then, for a known half life of the substance, and a known energy of the radiation emitted, calculations can be made of the actual dosage delivered to that tissue, in terms of a unit which is comparable with the standard roentgen. Hence it can be determined whether the amount of radioelement which can be concentrated in the organ will deliver a radiation dose which might be expected to be of any value.

Therapy.—Radiophosphorus is the only radioactive element which has had extensive clinical use. The largest number of cases treated have been leucaemias of all types. In chronic myelogeneous and lymphatic leucaemia, good remissions are obtained, the results are not spectacularly better than those with X-ray therapy, however there is an impression that remissions are longer, and abnormal types of cells disappear more completely under phosphorus treatment, while, in general, it is better tolerated than X-ray irradiation. In acute and subacute cases, little improvement is noted; this is also true in X-ray therapy.

Lymphosarcoma has been treated with radiophosphorus. The same types of case which do well under X-ray therapy do well with phosphorus; the type which does badly with X-ray does little, if any, better with phosphorus. Most of the cases in this series are too recent to permit conclusions to be drawn.

Several cases of polycythaemia have been treated at the University of California, with success.

At the Memorial hospital a number of patients with osteogenic sarcoma have received radiophosphorus therapy in the hope that it will be absorbed in clinically nonevident metastases and prevent their growth. Evaluation of results in these cases cannot be made as yet.

Neutrons.—Direct neutron beam therapy has been carried out at the University of California for three years, on a total of more than 150 patients. In almost all the initial results were good. Since most of the first cases treated had advanced disease, the results are felt to be sufficiently encouraging to warrant continued neutron therapy.

Irradiation with slow neutrons has been suggested on the basis of experiments at the University of Illinois and the Memorial hospital. If compounds containing boron or lithium are irradiated with slow neutrons, alpha particles are released, producing very intense local effects. *In vitro* experiments with mammary carcinoma, lymphosarcoma and sarcoma show that such local ionization is sufficient to cause lethal effects. *In vivo* it would be necessary to introduce into the tumour tissue a suitable organoboron or organolithium compound which should be nontoxic and should either diffuse out of the tumour very slowly or be decomposed and deposit the boron or lithium in the tissues. The affected region, or even large parts of the body, could then be irradiated with slow neutrons; little effect would be produced except where the boron or lithium atoms were found, and here intense alpha ray irradiation would ensue. Efforts to localize these substances by attaching them to a dye, etc., have not proved successful, but the problem did not in 1941 appear hopeless.

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Radium.

When the radium refinery at Oolen, Belgium, fell into German hands, the Belgian Congo ores were shifted to the United States, and receipts in 1940 amounted to 2,400,198 lb. of uranium-radium ore.

By the end of 1939 the capacity of the refinery at Port Hope, Ont., had been expanded to 8 grams of radium and 40 tons of uranium compounds monthly, but since the stocks on hand at the refinery were sufficient to keep the refinery working for three years or more, and since there was a sharp drop in the demand for both radium and uranium, operations at the mine at Great Bear lake were discontinued in June 1940. It was also reported that uranium concentrates had been received from the United States for treatment on a custom basis, but it was not known whether this represented domestic output or whether it was material imported from the Congo.

Nothing was known in 1941 of actual production or sales of radium during 1940, but it was understood that the agreement made several years before dividing the market between the Congo and Canada on a 60:40 basis remained in force, but that war conditions had severely restricted the market, the entire European continent having been eliminated for the time being.

World consumption was in 1941 estimated at 85% for medical use, 10% for luminous paints and 5% for other purposes, including the radiography of metal castings and forgings for inner flaws. Medical sales in the United States were estimated at 25 grams annually, and while radiographic applications were expanding, the nature of the use was such that only small amounts of radium were required. Use in luminous paints would probably expand considerably, especially in dials for aeroplanes, but since one gram of radium would be sufficient for several thousand planes, the demand would not be large. All indications seemed to point to a reduction of operations at the Port Hope

refinery, or the accumulation of a considerable amount of radium in surplus stocks during the remainder of the war. (*See* also URANIUM.) (G. A. Ro.)

Radziwill, Princess Catherine (MRS. CHARLES LOUIS KOLB-DANVIN), (1858–1941), U.S. writer and lecturer, was born March 30 in St. Petersburg. The daughter of a Czarist army officer of Polish birth, she was married at the age of 15 to Prince Adam Charles Radziwill, whose family was related to Frederick the Great. They resided in Berlin, where she met many of the great political and military leaders of the 19th century at Hohenzollern court functions. After the death of her first husband, she married Charles Louis Kolb-Danvin, an Alsatian business man. She went to the U.S. on a lecture tour, became a U.S. citizen and wrote a number of works on European politics and court life. Among them are *Germany Under Three Emperors* (1917); *Cecil Rhodes, Man and Empire Maker* (1918); *Intimate Life of the Last Tsarina* (1928); *The Taint of the Romanovs* (1931) and *It Really Happened* (1932). She died in New York city, May 11.

Railroad Retirement Act: *see* SOCIAL SECURITY.

Railroads. Fears, early in the year 1941, that the railroads of the United States would break down under the strain of national defense grew out of the facts that the railroads had emerged from the depression in a seriously weakened financial condition, that nearly one-third of their mileage was in receivership or in the hands of trustees, that the number of locomotives and cars had been materially reduced and were not fully maintained, and that the normal expenditures for additions and betterments had not been made since 1930. Notwithstanding these adverse factors, the railroads in 1941 produced more ton-miles than in any previous year and the service was performed without congestion, car shortage or unreasonable delay.

The revenue ton-miles in 1941 were approximately 470,000,000,000. The previous high record was in the predepression year of 1929 when the revenue ton-miles were 447,000,000,000. In 1941 freight cars (including privately owned cars) numbered about 1,890,000. The comparable figure for 1929 was 2,446,000. As to freight locomotives, the numbers in 1941 and 1929 were 21,754 and 29,248, respectively. Thus in 1941, with 23% fewer freight cars and 26% less locomotives, the ton-mile product was 5% greater than in 1929.

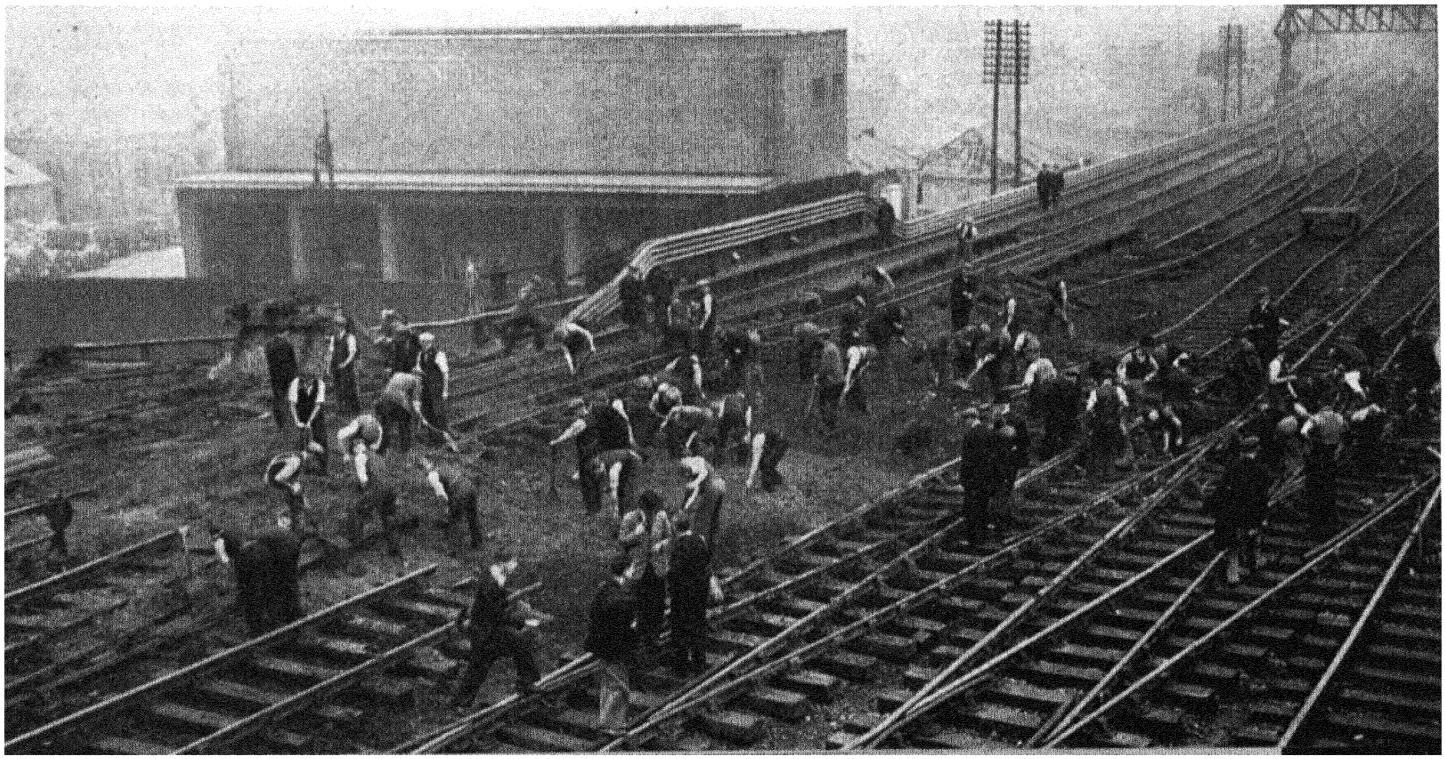
This creditable performance was due to three factors. Of greatest importance was the improvement in operating efficiency. The second and third factors were effective co-ordination among railroads and the several governmental agencies and cheerful co-operation of shippers. The improvement of freight-car performance is indicated in ton-miles per freight-car day. In the first nine months of 1941 the figure was 722. For the same period of 1929 it was 549. The freight-train load (first nine months) was 910 tons in 1941 and 808 tons in 1929. Co-ordination between the Association of American Railroads and the several governmental agencies was achieved and priority problems were avoided through a transportation commissioner of the council of national defense and by liaison officers of the railroads sitting in with the army and navy officers in charge of troop movements and the services of supply. The co-operation of shippers and receivers of freight, especially in the prompt loading and unloading of cars, was organized through the shippers' advisory boards.

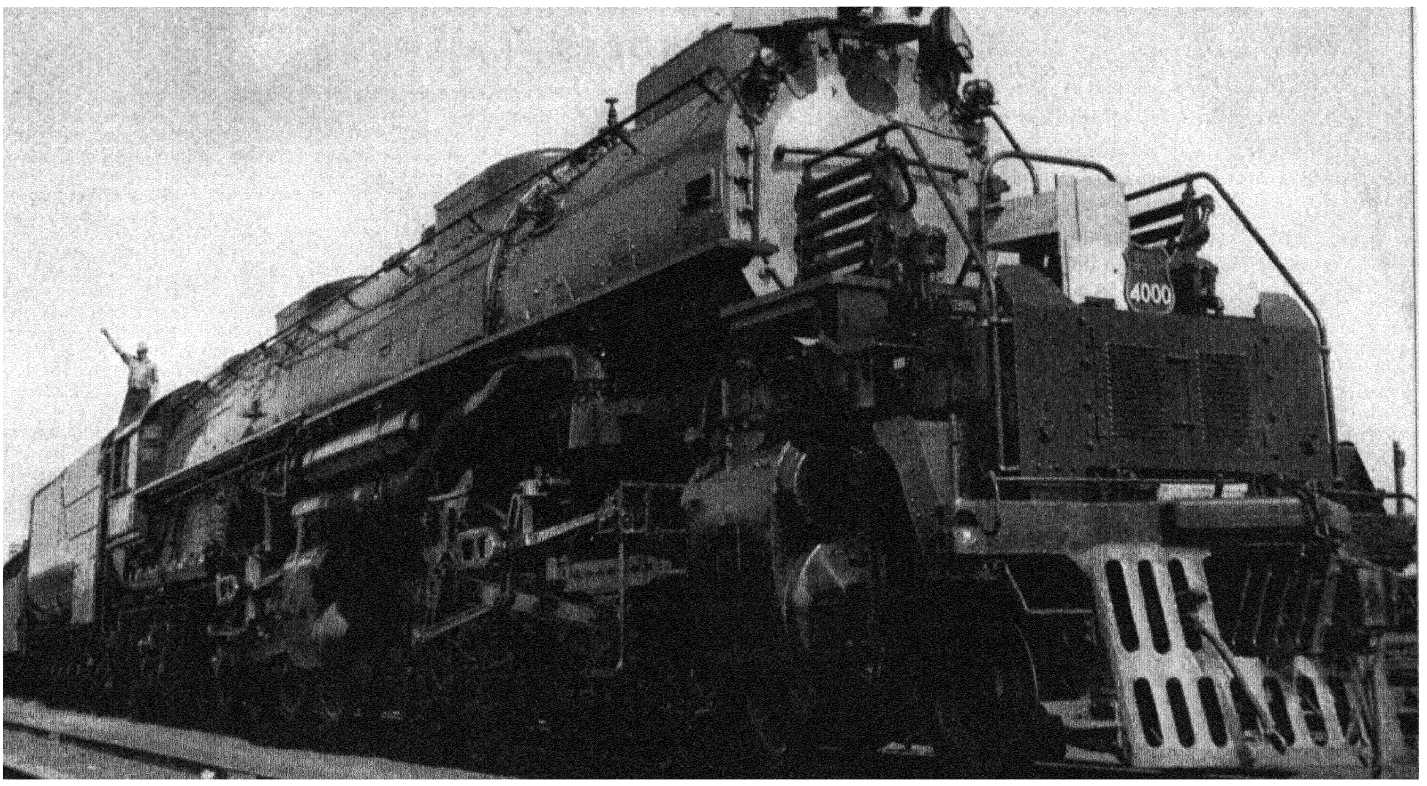
The volume of passenger traffic, including the movement of 3,000,000 troops, was greater than in any year since 1929.

Early in the summer the railroad labour unions took preliminary steps which led, early in December, to a substantial increase in the wages of practically all workmen and clerical forces and to the granting of vacations with pay to certain classes. These demands having been refused by the railroad managers, on the ground that the wage scales were as high as were justified by wages in other industries and as high as railroad earnings would permit, strike votes were taken and dates set for stoppage of work. Thereupon the president of the United States, acting under the authority of the Railroad Labor act, appointed a fact-finding board to investigate the dispute and make recommendations. The board, on Nov. 5, recommended temporary increases of 7½% for the train service brotherhoods and about 12½% with vacations for other employees.

These recommendations were not acceptable to the unions and the strike threat was renewed. At the suggestion of the president the controversy was again referred to the fact-finding board as

FOUR HOURS after a German bomb scored a direct hit on tracks of the London & North Eastern railway on the outskirts of the capital, early in 1941, full train service was resumed. A maintenance crew speedily filled the crater and laid new ties and rails





LOCOMOTIVE BUILT in 1941 for mountain hauling in the U.S. Rockies. The engine and tender weigh 596 tons; the locomotive was the largest in the world at the time of its completion

mediators. In that capacity, on Dec. 1, the board recommended and both sides agreed to permanent increases on a higher scale. The annual addition to the pay rolls by reason of these increases in wage rates and the granting of vacations would be about $332,000,000 on the basis of 1941 employment. To meet the higher costs of operation the railroads appealed to the interstate commerce commission for authority to increase freight and passenger rates about 10%, with certain exceptions. The hearings began in Jan. 1942.

Streamliners.—The policy of a few railroads of streamlining their passenger trains, reducing running time and adding to the comfort of passengers, was being adopted in 1941 on a larger scale and by more railroads. The number of new lightweight streamline trains placed in service from Sept. 1, 1940 to Nov. 1, 1941, was 34, and the number on order on the latter date was 26. Including the 34 trains mentioned above there were in 1941, 121 of these modern, lightweight, high-speed trains in operation, most of them powered with diesel engines. Generally speaking they were well patronized and were successful in increasing rail passenger traffic.

In the movement of freight the quality and adequacy of rail service was further improved and vigorous efforts were being made both by better service and by lower rates to regain a part of the merchandise and less-than-carload freight lost competitively to the trucks.

Income.—The income account of Class I railroads in 1941, 1940 and 1929 is given below in condensed form. The figures for 1941, partially estimated by the Bureau of Railway Economics, are taken from the *Railway Age* of Jan. 3, 1942.

Income Account of Class I Railroads, 1941, 1940 and 1929
(in millions)

	1941	1940	1929
Operating revenues	$5,325	$4,297	$6,280
Operating expenses	3,660	3,089	4,506
Tax accruals	550	396	397
Net Ry. operating income	980	682	1,252
Net income after fixed and contingent charges	485	189	807
Rate of return on property investment	3.72%	2.50%	4.81%

It may be noted that the increase in net railway operating income in 1941 over 1940, mainly attributable to the national defense traffic, was $298,000,000. That gain is $34,000,000 less than the estimated additional annual cost of the wage increases granted in December. If these wage rates had been in effect throughout the entire year 1941 they would have more than absorbed all of the net income from the gain of more than $1,000,000,000 in operating revenues. The outlook for the holder of railroad securities was not bright at the close of 1941.

The additional revenues from the greater volume of rail traffic in 1941 brought an improvement in the financial condition of the weak roads which had escaped bankruptcy in the depression years. The reorganization of two Class I railroads and four small properties (Class III) was completed and but one (of Class III) was added to the list of bankrupts. At the end of 1941, 97 railroads (including 35 in Class I) were in process of reorganization. Their mileage, 72,750, was approximately 30% of the total railroad mileage. Substantial progress was made in the procedural steps incident to reorganization.

Transportation Act.—The competitive effect on railroads of the broadened powers, in the 1940 Transportation act, of the interstate commerce commission over domestic water transportation was obscured by other factors incident to national defense. The demand for boats in other than domestic coastal service was so great as to induce several of the lines to sell many of their boats and cancel their former service. This gave the railroads additional business. The transfer of oil tankers to naval service threw a larger part of the oil tonnage to railroads.

Under the Transportation act of 1940 the president was directed to appoint a temporary board of investigation and research to make a study of the several modes of transportation and to report to congress on the relative fitness and economy of carriers by rail, highway and water, the extent to which each mode is subsidized and the extent to which each is taxed. There was delay in appointment by the president and in confirmation by the senate, and the board was not organized until late in the year. Its important tasks were no more than begun at the end of the year.

Office of Defense Transportation.—Late in December the president, by executive order, created the Office of Defense Trans-

portation and appointed Joseph B. Eastman (chairman, interstate commerce commission) as director, reporting to the president. The duties of the office are, among other things, to co-ordinate the transportation policies and activities of the several federal agencies and private transportation groups, to make estimates of transportation requirements and to co-ordinate domestic traffic movements. (*See* also BUSINESS REVIEW: *Industrial Groups.*) (W. J. C.)

Other Countries.—Instead of war imposing a halt to railway extension and development throughout the world, it resulted in a stimulus towards increasing railway capacity and brought about the construction of lines long projected and planned but hitherto regarded as economically unjustified. Progress and development have been so guided as to fulfill strategic needs and the changed flow of essential traffics. This was not only true of European conditions but applied to other continents in 1941.

Great Britain.—The main problems to be solved in 1941 were the continuance of operation under war conditions, with considerable interference from air raids during the first five months of the year, involving the rapid organization of repair work; the welding of the four railways and the London transport electric services into one even more cohesive operating entity; and, third, the completion of a new financial agreement between the railway companies and the government, necessitated by the latter's determination to alter the basis of payment for air-raid damage.

A progressive step of importance was the setting up of an Inter-company Freight Rolling Stock Control on March 1, 1941, thereby ensuring that the optimum use was made of the 1,240,230 wagons, 2,800 meat containers, over 400,000 sheets and 220,000 ropes. By this system many of the advantages of a single railway administration were obtained without eliminating the initiative derived from a four-company ownership of the main line railway network.

With many of the flows of traffic reversed or changed it became necessary to continue the reduction of many passenger services to ensure the essential movement of freight traffic; while detailed figures were not published it is known that the average length of haul of freight traffic increased, thus causing ton mileage to rise in greater proportion than tonnage loaded.

Under the new financial agreement, made public in Sept. 1941, there was a government guarantee to the four main line railways and the London Passenger Transport board of £43,000,000 annually; this may be regarded as net revenue in respect of a capital expenditure for the four railways of over £1,100,000,000, and for London transport of over £160,000,000; certain interest on investments is to be added to this £43,000,000, but air-raid damage is an unknown liability.

Technical Progress.—The Southern railway placed in service the first of its new streamlined "Pacific" locomotives of the "merchant navy" class. The London and North Eastern railway turned out the prototype of its new general utility locomotives, 2–6–2 "bantam cock" class, available for running over nearly all its main line mileage, and the S.R. and the L.N.E.R. both ran trials with their new main line electric locomotives. The Great Western railway provided certain of its classification yards with the electropneumatic route unit system of point control and added to its fleet of diesel railcars.

First class accommodation was withdrawn from all trains in the London area in October, primarily to simplify the handling of peak period traffic under war conditions. In view of blackout and other wartime difficulties, punctuality was well maintained, and dining cars and sleepers continued to run on the more important trains.

Railway Air Services were allocated the contract for carriage of mails to Northern Ireland.

Continental Europe.—With the exceptions of Switzerland, Spain, Portugal, Sweden and Russia, the railway working was virtually under German control, and all rolling stock was mobilized to serve the German war effort. Passenger services in France, Holland, Belgium and other countries were but a shadow of the prewar workings, and reconstruction of bridges and other war damage occupied thousands of military and labour corps men throughout western Europe. Many main lines in the Balkans were severed during the Greek and Yugoslav campaigns.

The Spanish railways, taken over by the government on Feb. 1, had still not overcome the ravages of the Civil War, and in eastern Europe, with the outbreak of the German-U.S.S.R. war, cases occurred where lines were converted twice in as many years from standard to Russian (5 ft.) gauge or vice versa. The entire railway equipment industry of continental Europe was harnessed to the German war machine, and the output of rolling stock to replace war losses was phenomenal, especially in respect of tank cars to handle Rumanian oil, owing to the diversion of this traffic from maritime routes.

Progress was made with many strategic lines, such as that between Shumen and Karnobat in Bulgaria, while improvements were carried out on a large number of arteries running east-west across continental Europe, chiefly in the Czechoslovak and Polish areas. Lack of fuel for highway vehicles placed an almost unbearable load on many European railway lines, and lack of railway fuel acted as a stimulant to railway electrification in France, Italy and Sweden. The Swiss and Swedish state railways obtained much added revenue from German-Italian and German-Finnish or Norwegian traffic respectively. Poor quality and shortage of fuel caused extensive railway delays, notably in Ireland (where peat was used as a substitute), France, Spain and the Balkans.

The steady progress achieved by the U.S.S.R. railways during recent years was necessarily checked by the German attack in June, but the ability to resist provided a good measurement of the vast improvement effected in the past decade. It is impossible to separate developments in European and Asiatic U.S.S.R., but figures show that automatic signalling was in use on over 3,200 route miles, and long mileages have been rock ballasted, greatly strengthening the track. There were over 55 classification yards in use on the 54,000 route miles of the system, and interesting trials had been made with condensing locomotives for working on Asian lines where water is not easily available; but for the war the "Red Arrow" express between Leningrad and Moscow would have been greatly accelerated. In Jan. 1941, the U.S.S.R. had 1,162 mi. electrified; recent conversions were the Zestafoni-Samtredi and Khashuri-Borzhom sections of the Transcaucasian; the Perm-Chesovekaya section was in course of conversion. Construction of new lines was proceeding apace early in 1941; among openings may be quoted the 260 mi. line from Neldy to Jezkazgan, a copper producing centre. The Trans-Siberian formed the only link between Japan and Manchuria and the countries of Europe under German-Italian control.

Asia.—The Iraq state railways came within the war zone for the first time and, after the completion of the Baghdad-Haydar Pasha through route, formed one of the chief supply routes for Turkey from Basra. To deal with the additional traffic several streamlined "Pacific" type locomotives were placed in service. On the neighbouring Iran state railways extension of branch lines from the chief Trans-Iranian main line continued; the most important was planned to link Tehran with the U.S.S.R. gauge line at Djulfa.

The Indian state railways received further standard type locomotives and converted several railway shops to war production purposes, while the Bombay, Baroda and Central India railway extended the use of air conditioned cars. Shortage of coastal shipping diverted much traffic to the railways. A surplus of about £11,000,000 was expected to result from the working during 1940–41; much of this was to be allocated to general government revenue. The Bengal-Dooars railway was the latest to be taken over by the Indian government; transfer took place at the end of 1940. Particularly successful financial results were achieved by the Nizam's state railway, where technical progress interlinked with initiative, such as the co-ordination with road and air services, greatly assisted the development of the state. The Ceylon government railways provided another example of additional motive power being urgently required, and some powerful locomotives of eight-coupled design were delivered, weighing in working order only 49 tons, a figure necessitated by the low axle load permissible. The Turkish state railways were hard put to it to carry the additional traffic offering, but new locomotives and wagons materially eased the position.

An event of considerable importance to the Japanese state railways was the completion in March 1941 of the pilot tunnel for the Moji-Shimonoseki railway tunnel, nearly four miles long.

Africa.—The most notable program of construction in Africa was the Vichy government's scheme to proceed with the Trans-Saharan railway, so long projected. Starting from Bou Arfar and built to the standard gauge it would eventually link Algiers to the Niger; the route adopted was understood to be via Timbuktu.

There was also construction work proceeding in Portuguese East Africa where a new line was completed from Manjacaze in October 1940, while in November the President Carmona bridge over the Komati was opened with ceremony, thus permitting through trains to work between Lourenço Marques and Guija.

The Kenya and Uganda railways, in view of their proximity to Abyssinia, were called upon to carry much war traffic, and their ability to deal with it was greatly assisted by the use of large Garratt type locomotives, some of which were added recently, and, of the 4–8–4 + 4–8–4 type, were believed to be the heaviest locomotives working on a metre gauge line; they operated a round trip of 1,106 mi. between Nairobi-Kampala-Nairobi, attaining mileages of 6,500 per month. Some diesel-engined railcars of articulated design were also placed in service in 1941. The Egyptian state railways were called upon to carry very heavy traffic and imported much additional equipment from Europe.

In the Union of South Africa the financial year 1940–41 concluded with another record in traffic receipts, reflecting a period of intense activity. In addition to the opening of a new line from Germiston to Jupiter at the end of 1940, heavy programs on deviation work to reduce grades and curvature on main lines were still in progress; a typical case was the line between Hercules and Koedoespoort which would relieve the main line to Pretoria of heavy traffic from the Eastern Transvaal and the Witbank coal area; when completed it would bring the mileage of the system up to 13,245. With a financial surplus of over £3,730,000 the system was in 1941 on a very sound basis.

Australia.—In Victoria the peak traffic problem of Melbourne suburban traffic became acute, with 1,000 passengers passing through the barriers at Flinders street every minute in the evening peak hour. By staggering office hours, it was hoped to ease the position.

The renowned "Spirit of Progress" express proved financially successful, over 250,000 passengers being carried in 1939–40. A new locomotive of remarkable design was placed in service on the Victorian railways, while the New South Wales government railways also introduced a new design of express locomotive.

Final figures for 1940–41 were likely to prove record ones in spite of 2,000 men having joined the armed forces. Improvements were effected at Darling Harbour, Sydney's freight station, which handles 1,300 wagons daily and collects a revenue of £3,000,000, being 15% of the railway's total. At gauge change stations, grab transporters were being installed to accelerate transhipment.

New Zealand.—The New Zealand government railways, on their extensive 3 ft. 6 in. gauge system were faced with considerable difficulty in designing powerful locomotives capable of operating safely over lines laid with only 50 lb. per yard rails, but a streamlined 4–8–2 "mountain" type was constructed, and was expected to fulfill all requirements. Forty of these were dispatched from Scotland.

South America.—In Chile, much railway construction was progressing, linking up isolated sections, while state ownership was being extended to the nitrate railways. Further use was being made of diesel trains and electrification in the Santiago area. In Argentina, the Buenos Aires Pacific developed the bulk movement of oil, wine and grain, but difficulties in regard to coal supply led to trials with a mixture of maize and coal for locomotive fuel. The financial situation of the Argentine lines showed little improvement, being partly due to problems of exchange; difficulties also arose with the financing of pension funds. Electrification plans continued in Brazil, where the policy of state ownership was being extended. An important resignalling scheme at Montevideo on the Central Uruguay

railway, making use of the relay interlocking method, and completed in 1940, marked the introduction of this system to South America.

Canada.—The two large Canadian systems were working at maximum pressure due to war traffic, and in 1941, the Canadian National railway was expected to earn due interest on its publicly owned capital. This system's Grand Trunk section borrowed locomotives from other American lines until its new motive power was received. Extensive improvements were made to the Montreal-Moncton-Halifax main line, greatly increasing its capacity, and further progress was recorded in the construction of the new Montreal passenger terminal. The C.N.R. continued to develop the Trans-Canada services, one new link operating between New York and Toronto. (*See* also DISASTERS: *Railroads;* UNITED STATES: *Transportation.*) (C. E. R. S.)

Rainfall: *see* METEOROLOGY; FLOODS AND FLOOD CONTROL.

Rapid Transit: *see* ELECTRIC TRANSPORTATION.

Rates of Exchange: *see* EXCHANGE CONTROL AND EXCHANGE RATES.

Rayon. The entry of Japan into the axis circle of fighting nations made rayon the textile fibre of greatest new interest in 1941. As far as the Allied nations were concerned, the final curtailment of silk supplies by the breaking off of commercial relations between the United States and Japan in July, began the trend of events that resulted in rayon being the first fibre to be allocated by the United States government for both military and civilian use. Former makers of silk hosiery and silk fabrics appealed to government agencies for a share of the rayon that was already on order by regular users of rayon. South American republics which had agreed to ship wanted metals and other war materials to the United States asked in exchange quantities of rayon yarn with which to make materials that would replace those previously imported from Japan, Germany and other countries no longer in a position to ship merchandise across the oceans. New uses for rayon and other synthetic fibres in war materials added their prior claim over all civilian needs. The shortage of rubber brought about through the Japanese aggression in Malaya resulted in increased use of a high tenacity rayon in tires, gasoline tanks for planes, etc. Demands for wool in government uniforms made a reduced civilian supply which in turn was to be appeased by the use of staple rayon fibre. Parachutes, whose original silk content gave rise to the name "Caterpillar Club" for aviators who had saved their lives by the use of the silken canopy provided by the silkworm or "caterpillar," were in the future to be made of nylon, the synthetic fibre that the hosiery industry had considered its own. Sailors' neckerchiefs and soldiers' ties of purest silk became fabrics of spun rayon and acetate filament rayon.

Even the official red tape ribbon affixed to official documents in Washington became rayon instead of silk. (*See* also SILK.)

The allocation was a precedent taken by the Office of Production Management in Washington immediately following the stoppage of silk supplies in July 1941. Ten percent of the monthly production of rayon yarn was ordered set aside for distribution to former silk users, of which 7% would go to hosiery mills and 3% to weavers. Shortly thereafter, the 3% was divided into 1½% for direct distribution to former silk weavers by the rayon producers and 1½% for distribution by the government upon special appeal to the director of priorities. The allotment was based on the former use of silk and the arbitrary equivalent adopted was three-fourths of a pound of rayon to one pound of silk. The basis was questioned by many manufacturers who claimed that due to the coarser size of rayon, the yards per lb. were reduced and that it therefore took a greater poundage to make a given number of yards of cloth.

Not only were rayon shipments controlled, but prices were also fixed by government edict. Prices were fixed not only for the yarn, by informal agreement with the producers, but for rayon fabrics of nineteen standard types, by formal ruling of the Office of Price Administration. Rayon was recognized as one of the basic commodities for civilian necessity, since official price schedules were set only on products in which there was a scarcity and for which there was such a wide public demand that rapidly rising prices would bring about inflation.

In Oct. 1941 came reports that the yarn supply would be further disrupted by an allotment to Latin America which needed the raw material for its newly active weaving mills. The development of the rayon industry in South America was the direct outgrowth of the cutting off of supplies from Japan and Germany principally. For some years, several ventures in weaving rayon, and even in production of rayon yarn, had been started in the Argentine, Chile and Brazil. Mexico also had some active looms. The product was mostly of a coarse type of cloth not made in the United States and more nearly approximating the inferior types produced in Japan for export. When countries in Latin American areas were thrown on their own resources for fabrics, the native mills developed rapidly. Some were under the management of American textile men (for example, the largest weaving plant in Chile), so that it was not surprising to find rayon yarn among the first things asked by South America and Mexico when Pan-American trade negotiations got under way. Because of the shortage of rayon yarn in the United States, due to the freezing of silk and use of wool for defense purposes, the percentage to be allotted to the other countries was subject to protracted discussion, not completed at the close of the year. It was estimated, however, that the final amount would be 4% for the first quarter of 1941. Based on 1941 average production, this would amount to about 5,000,000 lb. for three months. Whether the mills in Latin America were ready to absorb such an amount was questioned.

War conditions made it impossible to collect world statistics on rayon production for 1941. The United States, in 1940, produced over one-third of the world's supply, and it may be safely estimated that with conditions as they were in other producing countries, combined with the great increase in United States production, this proportion might be increased to one-half. For the United States, the 1941 annual production showed a total poundage of 573,230,000 compared with the 1940 record of 471,170,000. This increase of more than 20% included both filament and staple fibre. The major gains were made in staple fibre production—50%. The filament production was 16% greater than the 1940 output. The comparative figures for the years 1936 to 1941 are given in Table I.

Table I.—*United States Rayon Production in Millions of Pounds*

	1941	1940	1939	1938	1937	1936
Rayon filament yarn . .	451.2	390.1	328.6	257.6	321.7	277.6
Rayon staple fibre . . .	122.0	81.1	51.3	29.0	20.2	12.3

In relation to other textile fibres used in the United States over the same period, rayon's standing is shown in Table II.

Table II.—*Consumption in Millions of Pounds*

	1941	1940	1939	1938	1937	1936
Cotton	5,207.2	3,961.7	3,629.7	2,918.7	3,657.1	3,470.2
Silk	25.3*	35.8	47.3	51.7	53.6	57.8
Wool	644.9*	411.1	396.5	284.5	380.8	406.1
Rayon	452.4	388.7	359.7	274.1	267.1	297.8

*11 months actual, one month estimated.

The consumption of rayon by trades was marked chiefly by the increase shipped to the hosiery and knit goods mills. Nylon continued to be of principal interest to hosiery makers because of its superior elasticity and strength but their use of rayon yarn increased from 16,000,000 to 25,900,000 lb. in one year. Their share of rayon was principally in the viscose, cupra and nitro types. In 1941, they took 8% of the total production instead of 5% as in 1940.

Prices remained relatively stable. In Sept. 1941 producers, with one exception, issued a new price schedule in which a representative type, 150 denier viscose, was 55 cents a pound and acetate yarn, 150 denier, was also 55 cents a pound. Later, a manufacturer not included in the first group announced a price of 57 cents a pound for the acetate yarn. On Oct. 28, the Office of Price Administration approved a price schedule of 55 cents a pound for the viscose yarn and 56 cents for the acetate type. A comparison of rayon prices with those of other textile fibres, is shown in Table III.

Table III.—*Average Price for the Year, per Pound*

	1941	1940	1939	1938	1937	1936
Cotton	$0.139	$0.102	$0.093	$0.089	$0.118	$0.124
Wool	1.09	0.96	0.82	0.71	1.01	0.90
Silk	2.94	2.77	2.71	1.69	1.86	1.76
Rayon	0.54	0.53	0.52	0.52	0.62	0.57

BIBLIOGRAPHY.—*Foreign Commerce Weekly,* U.S. Department of Commerce; *Rayon Organon,* Textile Economics Bureau, Inc. (*See* also CELLULOSE PRODUCTS; INDUSTRIAL RESEARCH; TEXTILE INDUSTRY.) (I. L. BL.)

Receipts, Government: *see* BUDGETS, NATIONAL.

Reciprocal Trade Agreements: *see* TRADE AGREEMENTS.

Reclamation: *see* CANALS AND INLAND WATERWAYS; FLOODS AND FLOOD CONTROL; FORESTS; IRRIGATION; SOIL EROSION AND SOIL CONSERVATION.

Reconstruction Finance Corporation.

This is one of several agencies comprising the Federal Loan agency, under the supervision of the Federal Loan administrator, and may perform all functions it is authorized to perform under law to close of Jan. 22, 1947, or such earlier date as the president

Reconstruction Finance Corporation—Summary of Activities Feb. 2, 1932, through Dec. 31, 1941

	Authorizations	Disbursements	Repayments and Other Reductions
For benefit of agriculture	$ 2,604,071,430.83	$ 1,450,652,374.51	$1,448,940,848.88
To open banks to meet demands of depositors	1,334,805,161.08	1,138,251,619.27	1,082,584,822.41
For distribution to depositors in closed banks	1,391,474,104.19	1,035,530,126.44	1,003,087,205.58
For bank capital (including Export-Import banks $176,500,000, and Federal Home Loan banks $124,741,000)	1,645,205,689.00	1,469,712,331.56	744,230,583.71
For self-liquidating projects (including PWA municipal securities)	1,270,701,208.95	1,058,500,414.15	895,865,658.55
To business enterprises	587,650,930.18	271,978,915.25	162,329,107.20
For loans for national defense	5,338,512,873.16	980,346,623.21	173,152,054.89
For loan to Great Britain and Northern Ireland	425,000,000.00	350,000,000.00	4,844,381.30
For purchases of stock—national defense	120,100,000.00	20,100,000.00	
To drainage, levee and irrigation districts	147,747,818.64	98,210,980.63	25,397,370.03
To railroads (including PWA railroad securities)	1,531,530,885.54	1,027,450,714.70	554,448,632.08
For loans to and capital of mortgage loan companies (including $25,000,000 capital the RFC Mortgage company and $11,000,000 capital Federal National Mortgage association)	760,367,930.95	586,658,311.39	371,286,372.46
For loans to and capital of insurance companies	138,014,750.19	125,168,209.81	102,418,473.93
To building and loan associations (including receivers)	170,530,059.59	125,275,297.17	122,114,740.10
To public school authorities	25,674,050.00	23,242,170.85	22,303,900.00
Catastrophe rehabilitation loans	16,184,520.95	12,003,055.32	10,975,936.33
To state funds for insurance of deposits of public moneys	13,087,715.88	13,064,631.18	13,064,631.18
For mining, milling and smelting businesses	16,578,100.00	6,808,409.40	3,126,779.90
For loan to Export-Import bank	25,000,000.00	25,000,000,00	25,000,000.00
For other purposes	669,057.07	614,813.85	614,813.85
Total—By directors of the corporation	$17,563,806,385.20	$ 9,818,658,998.69	$6,765,876,312.38
Allocations and loans to other governmental agencies and for relief by direction of congress	3,484,649,945.66	3,199,696,363.30	2,852,014,066.63*
GRAND TOTAL	$21,048,456,330.86	$13,018,355,361.99	$9,617,890,379.01†

*Includes $2,738,724,131 of corporation's notes cancelled pursuant to act of congress, approved Feb. 24, 1938.
†Includes $42,508,118.06 credited on indebtedness for property taken over for debt.

may authorize. It was created by "an Act to provide emergency financing facilities for financial institutions, to aid in financing agriculture, commerce, and industry, and for other purposes," approved Jan. 22, 1932, which may be cited as the "Reconstruction Finance Corporation Act." The powers of the corporation were increased and the scope of its operations extended or otherwise affected by subsequent legislation. The corporation was organized and began operations on Feb. 2, 1932. Chairman, board of directors (1941), Charles B. Henderson. (C. B. H.)

Red Cross. The sufferings of war on two continents and the resulting dislocation in other parts of the world in 1941 precipitated one of the busiest years in the 77-year history of the Red Cross movement. The American Red Cross took a prominent role in the war relief operations of the International Red Cross. On June 30, 1940, American Red Cross foreign war relief reached $47,087,052—including large consignments of food, clothing and medicines; 4,000,000 individual garments, 336,158 layettes of 27 pieces each and more than 22,000,000 surgical dressings, all produced by chapter volunteers; more than 100,000 food boxes for Allied soldiers in German prison camps. Operations were made possible through a fund of $21,000,000 donated by the American public and through distribution of relief supplies purchased by the United States government.

For national defense, the American Red Cross was engaged domestically on two fronts—civilian and military defense. Red Cross services to the armed forces included: providing counsel and direct aid to soldiers and sailors through field directors in military and naval stations; chapter assistance to the families of men in uniform; the enrolment of nurses and medical technicians from which to draw personnel for military service; volunteer production of surgical dressings, sweaters and other articles of comfort; providing volunteer blood donors for the establishment of a 200,000-unit defense blood plasma bank; training service men as instructors in first-aid and water safety.

For the protection of the civil population the American Red Cross embarked on a project to train 100,000 nurses' aides, a corps of volunteers to assist nurses and alleviate the strain on current nursing facilities. Disaster relief preparedness was strengthened in chapters to be ready for mass feeding, housing and clothing of persons evacuated in time of wartime emergency. On the health front chapters were asked to gear their programs of teaching home nursing and nutrition. First-aid detachments were formed throughout the nation to protect life in factories, office buildings, schools and other locations where large numbers are concentrated. In these services the Red Cross worked in co-operation with the U.S. Office of Civilian Defense.

In 1941 the American Red Cross had 9,866 chapters and branches supported by 9,190,474 adult members and 9,749,053 junior members. Through this support the organization was able during 1941 to perform the following services:

Gave aid to more than 334,000 persons at the scene of 222 disasters at a cost of $896,000; trained 577,267 persons in first aid, 260,332 in water safety and distributed 9,000,000 accident prevention "check lists" to encourage removal of accident hazards in the home and on the farm; provided more than 4,500 registered nurses for military and naval service out of the first reserve of 20,000 nurses; maintained 639 nurses in 460 communities lacking other nursing facilities; 271 nutritionists and food experts taught classes in 121 chapters.

Red Cross field directors dealt with the problems of 126,515 men in the armed forces of the United States. Of these, 29,147 involved supplementary service by their home chapters. The chapters dealt with 127,098 cases of ex-service men and their families, of which 51,729 required supplementary service by the camp, hospital and liaison workers of the national staff. More than $1,000,000 worth of athletic equipment for army and navy field stations has been made available; an appropriation of $1,250,000 has been made for the erection of Red Cross headquarters buildings in army and navy stations, 62 of which have been completed. In addition the Red Cross began staffing and equipping 63 Red Cross recreation buildings erected by the army and navy at the sites of hospitals.

A total of 1,216,000 volunteers accomplished the following during 1941: For home and abroad, produced 14,523,773 garments; 20,502,900 surgical dressings for the army; 22,795,429 surgical dressings for foreign war relief; transcribed into Braille 473,365 pages and duplicated 371,138 pages for distribution among the blind; 1,408 chapters maintained emergency closets containing surgical dressings and clothing for disaster relief; canteen workers prepared and served meals to 104,557 persons; 6,576 members of the motor corps made 198,259 trips principally in behalf of disabled veterans and crippled children; Gray Ladies numbered 3,688 served in army and navy hospitals; home service workers made a total of 34,468 visits to assist field directors in handling cases of enlisted men and their families; staff assistants numbering 10,744 gave their time to perform general office work in chapters. (G. S. Br.)

The World.—World War II brought increased need for Red Cross activities throughout the world. National Red Cross societies and their international organizations, the International Red Cross committee and the League of Red Cross Societies, expanded and assumed new responsibilities.

In each of the major belligerent nations, with the exception of the Union of Soviet Socialist Republics, the International Red Cross committee, with headquarters at Geneva, Switz., maintained delegates to visit camps for war prisoners or civilian internees, saw that the provisions of the Geneva convention regarding prisoners of war were respected, arranged for the distribution of relief supplies, and facilitated the exchange of information regarding prisoners through the Central Agency for Prisoners of War established at Geneva by the International Red Cross committee. On the other hand, national Red Cross societies of belligerent governments, from their own resources or with government aid, secured and shipped through the International Red Cross committee supplies for their nationals held by the enemy.

The International Red Cross committee carried an increased burden in the exchange of messages between civilians in opposing countries. Brief personal messages on standard Red Cross forms collected in one belligerent nation, either by the national Red Cross society or the postal system, and sent to the International committee at Geneva were dispatched to civilians in enemy countries. It was estimated that 10,000,000 such messages were handled by the committee and its co-operating Red Cross societies during the year 1941.

The League of Red Cross Societies, the federal body of national societies, continued to promote through its Geneva headquarters Red Cross work for civilian populations. It reorganized its Pan-American bureau to strengthen the societies of the western hemisphere and prepare them to meet their wartime responsibilities. Together with the International Red Cross committee, the League of Red Cross Societies formed a joint commission to secure funds and supplies and extend relief to civilian populations especially in occupied European countries.

Red Cross committees representing countries occupied by axis powers were established in connection with their refugee governments in London, while at home the former Red Cross societies continued operations in most of the occupied nations although limited by military occupation. (P. E. R.)

Referendum: *see* INITIATIVE AND REFERENDUM.

Reforestation: *see* FORESTS.

Reformed Church: *see* PRESBYTERIAN CHURCH.

Refugees. In 1941 the various refugee migrations continued the patterns of movement established in the years

immediately preceding. In China, war refugees estimated at 30,000,000 fled from the cities before the Japanese armies along railways and highways to the agricultural hinterlands. The two substantial movements were from central China and the southeast to the southwest, and from the northeast to the northwest. The refugees consisted chiefly of skilled labourers, industrial leaders, small merchants, government employees, students and intellectuals. Unskilled labourers and peasants, through inertia, lack of funds, or the need for continued cultivation of the land, moved shorter distances and were prone to return to their homes as soon as the Japanese stabilized the occupied areas or the Chinese armies recaptured them. Whatever the final outcome of the war, the cultural and industrial imprint on the previously sparsely settled western agricultural areas of China would remain.

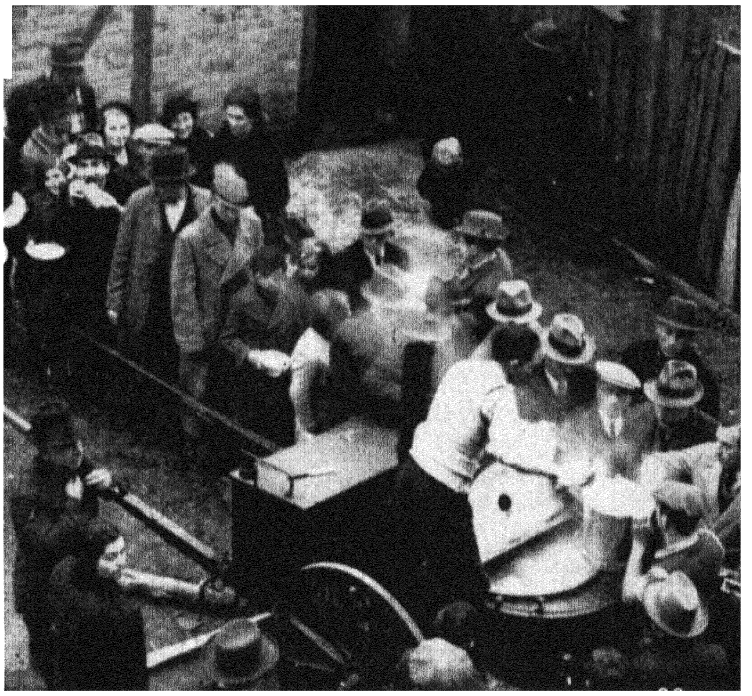
The movement of refugees from central Europe, Germany, Austria and Czechoslovakia, proceeded in greatly reduced volume compared with that of 1940, through the only remaining outlets, Lisbon and across Siberia through Vladivostok, Kobe and Yokohama to the western hemisphere. This movement, political in nature, had been precipitated in 1933 by the assumption of power in Germany of the nazi party and the introduction of the Nürnberg laws in 1934. The laws divided the German population into Aryans who remained as first-class citizens, and non-Aryans of Jewish blood, who were expelled. (*See* also ANTI-SEMITISM.)

At the beginning of 1941 substantial remnants of the various movements of peoples during 1940 were struggling desperately to get away from Europe through Portugal. The route across Siberia had not proved practical for substantial numbers and was virtually closed. Some 20,000 German and Austrian Jews were struggling to maintain life in Shanghai, China and approximately 2,000 had collected at Kobe in Japan. Many were still trapped in central Europe; 200,000 in Germany, 80,000 in Czechoslovakia, more than 1,000,000 in Hungary and Rumania and 1,000,000 to 2,000,000 in Poland.

The spread of the war to the Balkans in 1941 and the initial success of the German armies in the U.S.S.R. increased the fears of receiving countries overseas with respect to refugees. Popular belief, unsupported by fact, that "fifth columnists" were proceeding to the countries of immigration in the guise of refugees closed the gates of immigration ports tighter, and visas became increasingly difficult to secure. Spain refused passage to those of military age and Lisbon, concerned by the accretions to its refugee population, granted transit visas only to those possessing valid visas to countries of final immigration. Because of these restrictions, Casablanca in French Morocco became a new port of exit in 1941 as the refugees found or forced new routes of egress through Algiers or from Marseilles to Casablanca by boat.

Shipping from these ports was also increasingly restricted. French boats withdrew from the transatlantic service about midyear after one boat had been captured and after it became apparent that relief ships from America would not be passed through the British blockade. By the end of the year United States and Spanish boats had also withdrawn from the traffic, and only a few Portuguese boats remained in service.

In July 1941 the United States government concentrated its examination of visa applications in the state department at Washington, and the flow of refugees to the United States was reduced thereafter to a third of the volume of 1940. Immigration to South American countries during the year was reduced by the same proportions. The spread of the war to the eastern Mediterranean had also diminished both quota and nonquota immigration to Palestine. Earlier in the year there had been frequent reports of explosions and sinkings of overloaded refugee ships which dramatized vividly the desperate struggle of refugees to reach a haven of safety in the Jewish homeland in Palestine.



PORTABLE SOUP KITCHENS alleviated the food problem of Polish refugees only partially in 1941

In Nov. and Dec. 1941 the German government instituted a new drive to rid Germany of its non-Aryans. Sealed refugee trains again left centres like Vienna, Berlin and Prague for new ghettos in former Poland. The numbers transferred were estimated at 25,000 to 30,000. They included elderly people who previously had expected to live out their lives in their homes. Reports of conditions, particularly in the Warsaw ghetto, a centre of typhus infection, were distressing in the extreme. Simultaneously Germany refused exit westward to all those under 60 years of age.

Official bodies such as the League of Nations, the International Labour organization and the Intergovernmental committee were unable to act effectively during the year because international collaboration in other than the military sphere was precluded by the spread of the war to the far east and the western hemisphere. The settlement of refugees at Sosua in the Dominican Republic, an outgrowth of the work of the Intergovernmental committee organized at Evian, Fr., in 1938, continued hopefully with more than 500 refugees building a new life in agriculture as a demonstration of a pattern for refugee settlement on a larger scale after the war. By the end of 1941 refugees were no longer able to move in substantial numbers from their places of temporary abode either in the far east or from Europe to places of final settlement. Since 1933 the United States had accepted approximately 200,000 refugees from central Europe, South America 115,000 and Palestine 70,000. (*See* also CHILD WELFARE; JEWISH RELIGIOUS LIFE.)

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Regnault, Jeanne Julia: *see* BARTET, JEANNE JULIA.

Relay Racing: *see* TRACK AND FIELD SPORTS.

Relief. Trends noted in 1940 in relief giving and in its organization due to World War II continued to change the pattern of public and private welfare in 1941. In Britain the functions of the Assistance board were broadened to include many functions performed by local poor-law officials.

In Canada, on the other hand, in May 1941, the dominion government discontinued unemployment relief contributions to the

provinces, which in turn withdrew these contributions from local authorities, thus throwing back upon the latter the responsibility for care of the unemployed, many of which were unwilling or unable to assume the burden. No important change in structure of public welfare occurred in the United States. The amendment to the Social Security act that state and local agencies receiving federal grants-in-aid should have an acceptable merit system for selection of employees went into effect on July 1, 1941.

Public assistance in the United States showed two distinct changes. The amount given and the number of persons aided declined sharply, from more than $200,000,000 in January to less than $162,000,000 in October, and from more than 15,000,000 persons to somewhat more than 10,000,000 persons in October, respectively, October being the last month for which figures were available. However, in special categories such as blind, old age and dependent children, there were slight increases both in assistance and in number of families aided, the increases varying between 3% and 10%, while in general relief as in Work Projects administration there were decreases varying from 40% to nearly 50% in both assistance and in persons aided. As the demands for workers in the defense industries increased, the rolls of Work Projects administration and of general relief were drained of available workers, leaving only those who were incapable of working or persons belonging to minority groups, such as Negroes, not drawn into industry. But the fact that there were more than 220,000 unemployed in England in July was evidence that under the most severe pressure for workers, all cannot find jobs. (*See* FEDERAL WORKS AGENCY.)

Gifts to private agencies engaged in peacetime services in Canada and the United States as indicated by collections made by community chests (*q.v.*) were greater in 1941 than in 1940, in spite of large additional contributions collected for wartime services and for the Red Cross (*q.v.*). In each country collections were about 15% greater than in 1940—$3,274,407 for 14 Canadian community chests, as compared with $3,095,010 in 1940. In the United States an incomplete report showed $55,402,133 for 1941 as compared with $49,384,284 for 1940 in about 300 cities.

These sums were collected in the face of two drives for war relief funds in each country. The Red Cross in Canada appealed for $5,000,000 and received more than $6,000,000; and the federated war charities for $5,500,000 more, and received more than $7,000,000. In the United States, the United Service organizations (*q.v.*), created to minister to the needs of enlisted men and their families in communities near military camps, asked for $10,765,000, and secured nearly $2,000,000 more than asked for. The American Red Cross in late December asked for $50,000,000, which would probably be oversubscribed, although (Jan. 1, 1942) returns were not all in. (*See* also WAR RELIEF CONTRIBUTIONS.)

While England had not known the problem of nonresident dependents in the volume experienced by Canada and the United States, yet dislocations of populations caused by bombing caused great shifts in population. Early in 1941 the minister of health ordered that the usual health and welfare services "be extended to all evacuated and homeless persons" and reimbursement to local authorities would be made by the central government. In the United States, through a decision by the United States supreme court, the nonresident dependent won the right to cross state boundaries, which for about a decade had been denied him by several states, and a special congressional body appointed to study the problem of transiency made this significant statement: "A body of stateless people is appearing, existing in the limbo of lost settlement rights and forced to migrate in search of elusive employment." That committee recommended a new category in the Social Security act for grants-in-aid to states for general relief, requiring the state to abolish residence as a qualification for relief.

Of the nations at war, all made special provisions for the support of dependents of enlisted men except the United States, which up to the end of 1941 had not adopted any such measure. In England and Canada as well as Australia such provisions were contingent upon the enlisted man's apportioning half his pay to his dependents. Upon such action, the government made its additional allowance, automatically to wife and children, but to other dependents, such as parents, brothers or others, only on the evidence of need. In Canada by the end of 1941 there were nearly 250,000 accounts open in dependent's allowances and assigned pay in the dominion, and the government was paying more than $6,250,000 into these accounts each month. In Australia, only the wife, children and widowed mother were eligible to allowance from the state. Maximum monthly allowances from the state varied from 28*s.* for warrant officers to 7*s.* for privates whose pay was less than 17*s.* 6*d.* The precise amount allowed to each family was then determined by the number and kinship of the dependents. In Canada it varied within substantially the same range of rank from $60 a month to $10. In Australia allowances were not dependent upon rank of the enlisted man, and they might be as high as £4 a month.

Special provision was made for exceptional situations, by which extra grants might be made upon certain conditions. Canada placed authority to determine allowances in the Dependents' Allowance board in the dominion department of defense, but decentralized investigation and supervision by the use of local agencies, which might be public welfare bodies or private organizations.

In addition to these benefits during service, Canada in common with other warring countries offered privileges to discharged soldiers, such as financial assistance to complete either academic or professional education; subsistence allowance for vocational training; financial aid during illness not contracted in service; underwriting small business projects; and insurance against unemployment at least equal to that which civilians enjoyed under the Unemployment Insurance act. (*See* also MUNICIPAL GOVERNMENT; SOCIAL SECURITY; UNEMPLOYMENT.)

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Relief, War: *see* WAR RELIEF CONTRIBUTIONS.

Religion. Religion in 1941 presented an essentially unified picture by reason of its chastened and penitent mood and its focusing of attention upon the religious interpretation of history. The keynote editorial in the *Federal Council Bulletin* at the beginning of the year declared: "The most agonizing question of the day is whether we can discover any moral meaning in history." A statement of the bishops of the Church of England added that demonic and not merely human forces of evil were evidenced in the disorders of the age.

While maintaining a faith believed to derive from an Eternal Will above and beyond history, many religious people fell back upon the formula that men have to act under particular circumstances not of their own choosing in which often no morally pure choice is possible. A choice of the relatively good must consequently be made while at the same time religion asserts the final authority of absolute values. This doctrine of the paradoxical character of moral experience had wide vogue both in Europe and in America.

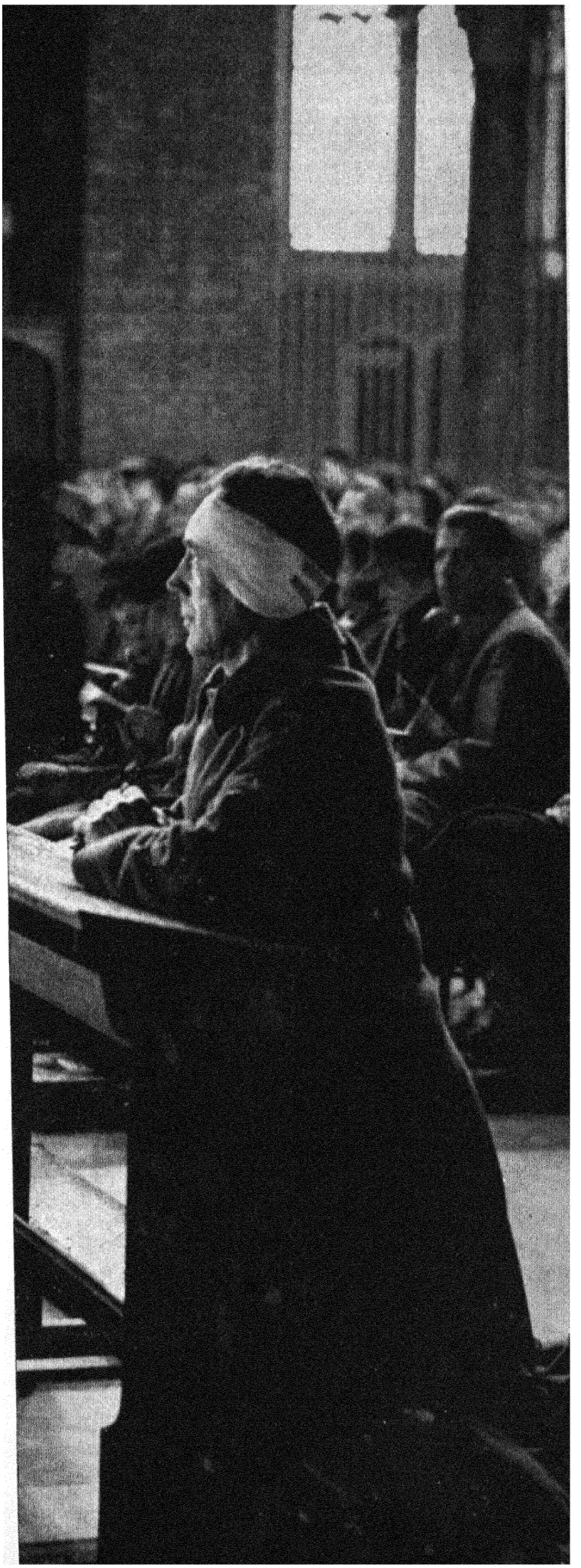
The more ultimate issue which confronted religion was that of the social revolution which many discerned behind and underneath the war and anticipated in full expression after it. The declaration of the archbishops of the English church, the Roman Cath-

olic cardinal primate of Britain and the moderator of the Free Church Federal council linked five demands—abolition of inequalities in wealth, equal opportunities in education for all, safeguarding of the family, the restoration of the sense of divine vocation to man's daily work and the use of the resources of the earth as God's gift to the whole human race—with the five conditions of international peace set forth by Pope Pius XII. The English Malvern conference convened under the auspices of the Anglican church, re-endorsed these ten points and elaborated their general viewpoint in a declaration which was widely influential in the United States and throughout the churches of the world.

The most immediate issue forced upon organized religion was that of the role of the church in a time of war. Virtually all Christian bodies engaged in prolonged discussions on this issue and scores issued pronouncements upon it. Almost universally the churches declined to identify the cause of God with that of any particular nation, their own or others. Hate was repudiated by representative churches even in the occupied countries. The oecumenical fellowship of the church was affirmed in spite of war by representatives of the churches in Japan and the United States. Patriotism in all countries nevertheless received strong reinforcement from religion, even in the case of nations like Russia, which had fostered anti-religious movements.

Because the state makes war, the issue of church-state relations was precipitated more pointedly than ever before in modern times. The churches universally asserted the prior allegiance of the religious man to God, and many of them accepted as a corollary the necessity of following conscience to the point of civil disobedience when conscience conflicted with the claims of the state. At the same time numerous accommodations of religion to the decisions of the state as the actual organ of the national will were to be noted. Russia exhibited new religious tolerance, while at the same time Christian bodies which had persistently denounced Russia for its godlessness modified their positions toward Russia as an ally in war. The inconsistency between these positions and those previously advocated was the basis, for example, of an attempt to line up churches in occupied countries on the axis side, on the plea of its anti-Bolshevist mission. Most militant pacifists, both in the United States and Britain, ceased active opposition to national policy; while the main body of Christians reluctantly acquiesced in the decisions of their nations in the matter of war.

Over much of the earth organized religion suffered persecution and acute hindrance in its work. A pastoral letter of 30 Catholic bishops in Germany asserted that the basic religious rights—those of carrying on religious and moral teaching, the free preaching of the Gospel and freedom of worship—were infringed upon there without any basis of military necessity. Churches in the occupied countries were oppressed in varying degrees by required oaths of allegiance, official control of services, pressure of party governments and anti-Semitic edicts. Great destruction by war, consequent vast migrations of population and multitudes of war refugees reduced many churches in central Europe virtually to the point of extinction. In belligerent lands great numbers of churches were bombed and religion everywhere was distracted by war demands and nationalistic pressure. These experiences served to draw the major religious communions closer to each other. Numerous communities which suffered war damage were holding united religious services for people of various communions. The "Sword of the Spirit" movement, originating in English Roman Catholic circles, drew as many Protestant followers as Catholic and associated the two religious groups to a point of intimacy.



WOUNDED R.A.F. MAN KNEELING In prayer at Westminster cathedral, London, on the fourth British national day of prayer, March 23, 1941

While the pressure of circumstances tended to increase the solidarity of religious movements and the sense of their common stake with science and philosophy in the maintenance of the democratic way of life, the choice which the times necessitated between religion and much that was going on in the world, tended to augment a sense of their distinctiveness in the minds of religious people. The slogan "Let the Church Be the Church," initiated by the Oxford World conference in 1937 had increased acceptance. This implied the belief that the Christian interpretation of life constituted the most profound creative process undergirding all constructive human effort. Religion was demonstrating anew the capacity of its inner life to survive any degree of human catastrophe. Christianity felt itself to constitute an actual world-wide society bound by ties which are deeper than its divisions and exemplifying both the structural principles and the spiritual force which ultimately hold the world together. (*See* also CHRISTIAN UNITY; also under separate churches.) (H. P. D.)

Religious Denominations: *see* CHURCH MEMBERSHIP.

Rennell, James Rennell Rodd, 1ST BARON, OF RODD (1858–1941), British diplomat, was born Nov. 9. Educated at Oxford, he entered the diplomatic service in 1883. In 1897 he headed a British mission to King Menelik of Abyssinia and paved the way for the establishment of a permanent British envoy to Addis Ababa. He was minister to Sweden, 1904–08, and ambassador to Italy, 1908–19. In 1920 he accompanied Lord Milner's mission to Egypt and was a delegate to the League of Nations in 1921 and 1923. After retiring from the diplomatic service, he was a member of the house of commons from the St. Marylebone district of London, 1928–32. He was created a peer in 1933. Lord Rennell died at Ardath, his home in Shamley Green, Surrey, July 27.

Representatives, House of: *see* CONGRESS, UNITED STATES.

Republican Party. When the 77th congress convened for its first session on Jan. 3, 1941, two months after the re-election of President Roosevelt for a third term, the Republicans held 28 senate and 162 house seats. Senator Charles L. McNary of Oregon, and Representative Joseph W. Martin, Jr., of Massachusetts continued, respectively, as Republican senate and house leaders. Representative J. William Ditter of Pennsylvania served as chairman of the Republican Congressional committee, and former Senator John G. Townsend, Jr., of Delaware headed the Republican Senatorial committee.

Throughout 1941, questions of foreign policy overshadowed domestic issues. Continuing its program of aid to Great Britain, and other countries resisting aggression, the Roosevelt administration took steps to make available to the nations aligned against the axis, in increasing measure, the material resources of the United States.

In their attitude toward the administration's foreign policies, the Republicans were sharply divided. Soon after its presentation to congress in January, Wendell L. Willkie, Republican candidate for president in 1940, announced his support of the administration's new lend-lease bill. Following a visit to England in the spring, he urged all-out aid for Great Britain.

Though Willkie, in his endorsement of the president's foreign policies, had the backing of many members of his party, other Republicans, including most of the party leaders in congress, sharply criticized the administration's international program, and warned that the president, in his anti-axis moves, was heading the country into war.

In congress, the trend of Republican sentiment was predominantly non-interventionist. With few exceptions, Republicans in both houses voted against the administration's proposal to amend the Neutrality act and authorize the arming of American merchant ships. Only 23 Republicans in the house voted for the new lend-lease authorization. Though approving measures to strengthen the army and navy, most Republicans opposed the bill to extend for 18 months the service of men called to the colours under the Selective Service law. Seven Republicans voted for draft extension in the senate and 21 in the house.

Representative Joseph W. Martin, Jr., of Massachusetts, who had served as the chairman of the Republican national committee since the 1940 party convention, submitted his resignation at a meeting of the committee in Washington, D.C., on March 21. The committee refused to accept his resignation and Martin agreed to continue at the helm of the national organization. Sinclair Weeks, also of Massachusetts, was named treasurer of the committee.

As national chairman, Martin travelled widely during the year, addressing state and local party organizations, and directing preparations for the 1942 congressional elections. Franklyn Waltman, director of publicity, and a former newspaperman, announced his resignation on Nov. 13. The Republicans gained several seats in the house in scattered elections held during 1941. Following the death of Senator Alva B. Adams, Democrat, of Colorado on Dec. 1, Governor Ralph L. Carr appointed a Republican, Eugene D. Millikin, to fill the vacancy.

With the entrance of the United States into World War II against the axis in December, the Republicans, previously sharply divided over the administration's foreign policies, closed ranks, and joined with the Democrats in securing quick passage of legislation to mobilize the full resources of the United States in men and materials in the war against Hitlerism.

Only one member of congress, Representative Jeannette Rankin, Republican, of Montana, voted against the Dec. 8th declaration of war against Japan. Both houses unanimously approved the war declarations against Germany and Italy on Dec. 11.

On Dec. 10, two days after the United States declared war against Japan, Representative Martin, and Edward J. Flynn, chairman of the Democratic national committee, in an exchange of letters, agreed to work in close collaboration to further the success of the U.S. war effort.

Because of the war, Chairman Martin, on Dec. 21, announced an indefinite postponement of a meeting of Republican state chairmen that had been arranged for Jan. 12, 1942. "Nothing must be allowed to interfere in the vigorous efficient prosecution of the battle to preserve American freedom," said Mr. Martin.

On the eve of the opening of the second session of the 77th congress, Martin gave a pledge of full Republican co-operation toward winning the war, promising, however, that the minority, as the opposition party, would call attention to "honest mistakes" made by the administration in prosecuting the war effort. On Jan. 4, 1942, Clarence Budington Kelland, author and magazine writer, was appointed executive and publicity director of the Republican national committee. (*See* also ELECTIONS; UNITED STATES.) (O. McK.)

Respirators: *see* INFANTILE PARALYSIS.

Retail Sales: *see* BUSINESS REVIEW: *Retail and Wholesale Trade.*

Réunion: *see* FRENCH COLONIAL EMPIRE.

Rheumatic Fever: *see* EPIDEMICS AND PUBLIC HEALTH CONTROL.

Rhode Island. A north Atlantic state of the United States. in New England; one of the 13 original states; popularly known as "Little Rhody." Area, 1,214 sq.mi. (smallest

of the United States); pop. (1940) 713,346. The urban population was 653,383 (91.6%). Capital, Providence (253,504). Other cities include Pawtucket (75,797); Woonsocket (49,303); Cranston (47,085); Newport (30,532); Warwick (28,757); Central Falls (25,248).

History.—At the regular 1941 session of the legislation, leading measures passed were the following:

Amendments to the civil service law, giving the governor power to replace the commission; an act creating a four-member bipartisan board of elections; an act giving housing authorities the right to exercise power of eminent domain; an act creating a state council of defense and authorizing local and district councils; an act requiring state and municipalities and construction companies doing business by contract with state or municipalities to rehire persons drafted or inducted into the armed services; an act guaranteeing to persons entering the armed forces a maximum unemployment compensation of $16 weekly upon their discharge, as long as they are unemployed or as long as their wage credits last; amendments to the workmen's compensation law, increasing allowances for medical and hospital care and changing the base for computing compensation; an act extending the emergency period for state unemployment relief for one year and providing penalties for accepting relief fraudulently; an act creating a state labour relations board; and a new law of arrest.

The chief executive officers of the state elected in Nov. 1940 for 1941–42 were:

J. Howard McGrath, governor; Louis W. Cappelli, lieutenant governor; Armand H. Cote, secretary of state; John H. Nolan, attorney general; Russell H. Handy, general treasurer. Edmund W. Flynn was chief justice of the supreme court.

Education.—During 1940–41 there were in the public elementary schools 62,856 pupils and 2,186 teachers; in junior high schools 24,133 pupils and 1,006 teachers; in senior high schools (three years) 18,034 pupils and 817 teachers; in senior high schools (four years and vocational) 5,381 pupils and 222 teachers. The enrolment in the State college was 1,254 and the teaching staff numbered 94. Enrolment in the State College of Education was 498; the teaching staff numbered 33.

Public Welfare, Charities, Correction.—The total number of persons receiving relief in all categories (including a small amount of overlapping among categories) in Nov. 1941 was 21,385, or about 3% of the state's population. The total amounts paid out during the year Dec. 1, 1940–Nov. 30, 1941 were as follows: state unemployment relief, $1,622,494; soldiers' relief, $87,445; old-age assistance, $1,732,339; aid to dependent children, $708,353; aid to the blind, $20,128. In unemployment compensation, the gross amount of benefits paid during 1941 was $3,594,100.73 to 42,709 different individuals. The amount paid into the fund during 1941 was $13,321,229.24. WPA monthly average employment for the year ending June 30, 1941 was 9,768. Total expenditure for the fiscal year was $7,432,441.46.

There were 910 inmates in correctional institutions in Oct.–Nov. 1941, and 4,478 patients in charitable institutions and institutions for defectives.

Communication.—The total mileage of highways on Dec. 1, 1941 (excluding city streets) was 2,680.86. Expenditures (1941) for the 801.58 mi. of constructed state highway system totalled $3,431,000. The total mileage of railways was 138.21. Water-borne commerce of the state for 1940 was 7,389,110 tons. Airways totalled 120 mi.; there was one airport, two landing fields. In Jan. 1941 there were 125,796 telephones in service.

Banking and Finance.—There were 35 banking institutions in 1941. Resources of 23 banks under state supervision totalled $474,822,392.63 and of 12 banks under federal supervision, $149,724,519.81. Savings deposits (exclusive of club accounts) in savings banks and trust companies (the 23 state banks) amounted to $319,624,619.81 on June 30, 1941. In addition, six loan and investment companies had resources of $9,996,344.94; eight building and loan associations, $40,028,893.06; 18 credit unions, $4,235,208.18.

At the close of the fiscal year, June 30, 1941, total state receipts were $18,530,403.36; expenditures and encumbrances, $18,315,130.05; surplus from operation, $215,273.31. The state gross debt was $30,766,000; net debt, $25,302,823.92.

Agriculture.—The total value of agricultural production was $11,736,000 in 1941 and $10,944,000 in 1940. Total acreage harvested was 47,600 in 1941. Cash income from crops in 1941 was $4,300,000; from livestock, $7,200,000; from government payments, $100,000; making a total of $11,600,000.

Table I.—*Leading Agricultural Products of Rhode Island, 1941 and 1940*

Crop	1941	1940
Corn for grain, bu.	39,000	38,000
for silage, tons	57,000	54,000
Hay (tame), tons	40,000	46,000
Potatoes, bu.	920,000	916,000
Oats, bu.	144,000	136,000
Apples (commercial), bu.	278,000	267,000

Manufacturing.—The total estimated value of manufactures was $516,390,541 for 1939 and $517,196,193 for 1937. Total employment in 1939 was 106,269 wage earners and 12,005 salaried personnel. The number of establishments was 1,460. Wage earners received $105,406,950 and salaried personnel, $27,940,576.

Table II.—*Principal Industries of Rhode Island, 1939 and 1937*

Industry	Value of Products	
	1939	1937
Woollen and worsted	$128,542,594	$136,915,685
Dyeing and finishing	41,497,061	29,259,406
Cotton	35,622,185	38,959,390
Rayon	30,206,766	25,760,092
Machinery (including electrical)	26,909,680	20,113,660
Jewellery	19,497,109	28,734,064
Rubber	16,253,109	14,481,321

Mineral Production.—The value of mineral production in Rhode Island is small: $980,916 in 1939 and $911,599 in 1938. Stone ($558,944 in 1939) and sand and gravel ($265,631) are the principal products.

(M. C. ML.)

Rhodesia. The territory extending from the Transvaal border northward to the boundaries of the Belgian Congo and of Tanganyika Territory. It is bounded on the east by Portuguese East Africa, Nyasaland and the Tanganyika Territory, and on the west by Belgian Congo, Portuguese West Africa and Bechuanaland. Area 440,656 sq.mi.; comprises two territories of the British empire; viz., Southern Rhodesia and Northern Rhodesia. Southern Rhodesia is a self-governing member of the British commonwealth, but supervision over native rights is reserved to the imperial government.

Northern Rhodesia remains a dependency of the crown. Certain essential statistics are given in the table on p. 570. (*See* also BRITISH EMPIRE.)

History.—The governors of Northern and Southern Rhodesia and Nyasaland met in conference at Salisbury in 1941 to establish a standing secretariat for co-ordinating the war effort of the three territories. The headquarters of the Rand Native Labour association tropical areas administration was moved to Salisbury, though the Rand mines would not recruit from Southern Rhodesia, where the labour shortage was acute, but from Nyasaland and Barotseland.

To reach the latter country, some 600 mi. of road were constructed through the Kalahari desert. The tropical labour recruited for the Rand was at the rate of more than 20,000 men per annum in 1941.

Southern Rhodesia.—Southern Rhodesian airmen and other white troops took a prominent part in the East African campaign. An African regiment, the Rhodesian African Rifles, was raised in 1941. African chiefs from Matabeleland visited the camp and were much impressed by the effects of military discipline and training.

Increased mining activity and the demands for primary products improved general prosperity but intensified the shortage of African labour in 1941. Proposals put forward by employers for conscription of African labour were turned down by the prime minister. A land apportionment act emphasized the policy of territorial segregation, but at the same time more attention was paid to welfare services for Africans. From each of two districts Africans had contributed more than £1,100 to buy mobile canteens for bombed areas in Britain.

Northern Rhodesia.—The governor of Northern Rhodesia, Sir John Alexander Maybin, died in April 1941. He was succeeded by Sir Eubule John Waddington.

The need for base metals mined on the Copper Belt and elsewhere greatly increased production and there was a corresponding demand for more food crops.

Arrangements were made to buy maize from the Belgian Congo, where there was a surplus. The Beit trustees promised £6,000 toward a new pathological laboratory at Lusaka and the African hospital at Mazabuka. New premises for the Jeanes school were

Rhodesia

Territory and Area in sq. mi.	Principal Products	Imports and Exports (in thousand £)	Road and Rail	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary 1938
NORTHERN RHODESIA 290,323	(export 1940) copper, blister, £7,452,644 copper, electrolytic, £1,270,638	(1939) imp. 4,631 exp. 10,220	(1938) All rds. 8,143 mi. rly. 622 mi.	(1940) rev. 2,245 exp. 2,026	Eurpn. schls., 18, schlrs., 1,320; African schls., 431, schlrs., 35,570.
SOUTHERN RHODESIA 150,333	maize (1938-39) 109,800 metric tons coal (1939) 1,118,000 metric tons gold (1939) 24,746 kg.	(1940) imp. 9,323 exp. 13,309	(1939) Main rds. 1,621 mi. rly. 1,361 mi.	(est. 1941-42) rev. 6,058 exp.: ord. 3,959 war 2,283	Eurpn. schls., 111, schlrs., 10,762; Asiatic and coloured schls., 12, schlrs., 11,426; native (1937) schls., 1,283, schlrs., 108,995.

opened at Chilambana, where village teachers are trained and courses are held for chiefs. Broadcasts were given from Lusaka in several African languages in 1941. The tuning-in signal was given by African drums. (M. RD.)

Ribbentrop, Joachim von (1893–), German statesman, was born April 30 at Wesel on the Rhine and was educated at the gymnasium at Metz. In 1910 he went to Canada as an independent merchant. At the outbreak of war in 1914 he returned to Germany, enlisted in a Hussar regiment, advanced to lieutenant colonel, and by the end of the war was attached to the war ministry. After the war he returned to private business as a wine merchant. He first became identified with the nazi party as a worker in 1930. At his home in Berlin-Dahlem were held the important meetings that preceded Hitler's appointment as chancellor of the reich, Jan. 30, 1933. In 1935 Ribbentrop was appointed ambassador-at-large, and from 1936 to 1938 he was ambassador to Great Britain. He became foreign minister Feb. 4, 1938, and played a prominent role in the diplomatic negotiations that preceded the war.

Ribbentrop was at Hitler's elbow during all the latter's more important conferences with representatives of other states in 1940 and 1941. He was also charged with releasing the official German apologias for the various invasions undertaken in those two years. On March 21, 1941, he asserted at Munich that "developments of 1941 will force our opponent to admit his defeat."

Ribeiro, Manoel (1879?–1941), Portuguese novelist and keeper of the National archives in Lisbon, was the author of *The Cathedral,* his first and most successful work. This book was followed by two other volumes to complete a trilogy, *The Resurrection* and *The Desert.* His last novel was *Evergreen Thorn.* Ribeiro died in Lisbon in November.

Rice. The western hemisphere, long dependent on the orient for a large part of its supply of rice, became 95% self-sufficient in rice production after the outbreak of World War II, the office of foreign agricultural relations of the U.S. department of agriculture reported Dec. 15, 1941. For the first ten months of 1941 Cuba, a large consumer of rice, imported 319,512,000 lb. Of this amount, 295,620,000 lb. was from the United States and 15,216,000 lb. from the orient; the remainder was from Ecuador and the Dominican Republic. In the same period in 1940 Cuba imported 227,649,000 lb. of rice from the United States, 118,731,000 lb. from the orient, 728,000 lb. from Egypt and none from Ecuador or the Dominican Republic. Rice production in the United States in 1941 was 54,028,000 bu.; slightly less than the 54,433,000 bu. of 1940; the ten-year (1930–39) average was 45,673,000 bu., all produced in four states, Louisiana, Texas, Arkansas and California. The United States area planted to rice in 1941 was 1,245,000 ac., compared to 1,069,000 ac. in 1940 and a ten-year average of 942,000 ac. The yield was 43.4 bu. per ac. in 1941; in 1940 it was 50.9 bu. per ac.; the ten-year average was 48.4 bu. per ac.

Burma, the world's largest rice-exporting country, reported a 1941 crop of 401,600,000 bu. Exports for the first ten months of 1941 were 6,580,596,000 lb., compared to 5,533,073,000 lb. in the same period of 1940. The Burmese government announced in Sept. 1941 that the government would take over exports of rice in order to protect the growers after the freezing of Japanese credits by the United States, Great Britain and the Netherlands in July. Japan, Burma's second largest customer, took 1,028,691,000 lb. of Burmese rice in the first ten months of 1941. India imported 2,372,648,000 lb. from Burma in that period. The Philippines also bought 17,000,000 lb. and the Dutch Indies bought 22,000,000 lb. of Burmese rice. Production of rice in British Malaya in 1941 was reported as approximately that of 1940 (27,776,000 bu.). Malayan imports of rice were greatly increased in 1941 in anticipation of war with Japan. Malaya ordinarily subordinates rice to rubber production and produces little more than a third of its requirements. Production of rice in other countries is shown in Table I.

Table I.—*Production of Rice in Certain Countries, 1941 and 1940*

000's omitted

Country	1941 bu.	1940 bu.	Country	1941 bu.	1940 bu.
China	2,327,000*	2,252,000	Manchoukuo	40,000	34,000
Japanese empire			Spain	12,740	11,800†
Japan proper	541,000	555,000	Peru	6,190	4,800
Chosen	216,000	196,000	Uruguay	661	851
Taiwan	83,000	72,000	Haiti	350	—

*Preliminary and unofficial. †Trade estimate.

A 1941 crop of 12,000,000 bu. in Brazil was reported greatly reduced by floods.

Table II.—*U. S. Production of Rice by States, 1941 and 1940*

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Louisiana	19,906,000	18,760,000	Arkansas	11,342,000	9,588,000
Texas	13,600,000	16,645,000	California	9,180,000	9,440,000

(S. O. R.)

Rickert, Thomas A. (1876–1941), U.S. labour leader, was born April 24 in Chicago, Ill. Educated at public schools and at a business college, he went to work as a garment cutter and at 19 he took active part in union affairs. In 1904 he was elected president of the United Garment Workers of America (A.F. of L.), a post he held until his death. He was a member of the war labour board during World War I and was named to the industrial conference called by President Wilson in 1919. Although Rickert was appointed by President Roosevelt to several committees during the early New Deal days, he later became sharply critical of the administration's labour policies. Known as a conservative in labour ranks, he was an outspoken foe of concessions to the C.I.O. Rickert, who was a second vice-president of the A.F. of L., died in New York city, July 28.

Rickets: *see* MEDICINE.

Riddle, John Wallace (1864–1941), U.S. diplomat, was born July 12 in Philadelphia, Pa. He graduated from Harvard in 1887, attended Columbia university law school, 1888–91, and the École des Sciences Politiques, Paris, Fr., 1891–93. He was secretary in the U.S. legation in Turkey, 1893–1900, secretary in the U.S. embassy in Russia, 1901–03, diplomatic and consul general to Egypt, 1903–05, minister to

Rumania and Serbia, 1905–06, and ambassador to Russia, 1906–09. He served with the military intelligence division of the general staff at the Army War college, 1917–18. Riddle was ambassador to Argentina, 1921–25. He died in Farmington, Conn., Dec. 8.

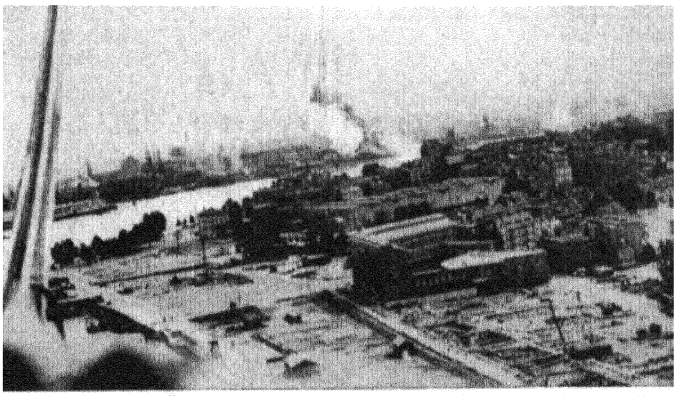
Ridge, Lola (Mrs. David Lawson) (1884–1941), U.S. poetess, was born in Dublin, Ire., and spent her childhood in Australia and New Zealand. She went to the United States in 1907, wrote fiction for popular magazines and edited an experimental poetry review. In 1929 she published *Firehead,* a 218-page narrative poem dealing with the Crucifixion. This work was inspired by the Sacco-Vanzetti case. In 1935 she received a Guggenheim fellowship and in both 1934 and 1935 she received the Shelley Memorial prize for poetry. Her poems were intensely class-conscious and displayed deep sympathy for the labouring man. Among her works are *The Ghetto and Other Poems* (1918); *Sun-Up and Other Poems* (1920); *Red Flag* (1927); and *Dance of Fire* (1935). She died in Brooklyn, N.Y., May 19.

Rio de la Plata Conference: *see* Uruguay.

Ripley, William Zebina (1867–1941), U.S. economist, was born Oct. 13 at Medford, Mass. He was graduated from the Massachusetts Institute of Technology in 1890 and received his Ph.D. degree from Columbia university in 1893. He joined the Harvard faculty in 1901 as professor of political economy, retiring in 1933. He was awarded the Huxley Memorial medal for his lectures in 1908 at the Royal Anthropological institute in London. During World War I, Ripley was administrator of labour standards in the war department, and from 1919 to 1920 he was chairman of the National Adjustment commission of the U.S. shipping board. A sharp critic of the corporate practices of big business, he urged the government in hearings before senate inquiry committees in 1931–32 to place rigid curbs on investment trusts and to probe the financial affairs of big corporations. He was employed by the interstate commerce commission as a consolidation expert, 1920–23, and drew up the Ripley plan to merge railroads into 19 regional groups; this plan formed the basis of a later I.C.C. consolidation formula. He was the author of *The Races of Europe* (1900); *Trusts, Pools and Corporations* (1905); *Railway Problems* (1907); *Railroads—Finance and Organization* (1914), and *Main Street and Wall Street* (1927). Professor Ripley died at his summer home in East Edgecomb, Me., Aug. 16.

Ritchie, Neil Methuen (1897–), British army officer, was born July 29, and was educated at the Royal Military college at Sandhurst. He entered the army at the age of 17 as 2nd lieutenant in the famous Black Watch regiment (42nd Highlanders). He served on the western front during World War I, went to Mesopotamia, 1915, and saw action in Egypt, 1918. He was wounded in action and won the distinguished service order and military cross. After the war, he passed through the Staff college, held war office and Indian appointments and served in northern India and Palestine. In Jan. 1938 he received command of the King's Royal regiment (Lancasters). In 1939 he became colonel, was an acting brigadier general within a year and acting major general by Oct. 1940. He had been deputy chief of the middle east general staff for some months, prior to his appointment on Nov. 26, 1941, as commander of the 8th army in Libya, succeeding Sir Alan Gordon Cunningham (*q.v.*).

Rivers and Harbours. Federal improvement of rivers, harbours and other waterways in continental United States, Puerto Rico, Alaska and the Hawaiian Islands for navigation and allied purposes is prosecuted by the corps of engineers, U.S. army, under the direction of the secretary of war and the supervision of the chief of engineers, in accordance with plans authorized by congress. The facilities provided by these works are vital to the commercial and general economic development of the United States in normal times and are essential to that country's need in times of war.



THE DOCKS OF ROTTERDAM were pounded with regularity by the R.A.F. in 1941 to destroy German shipping in the Netherlands port. This photograph was taken from one of the raiding British planes whose tail is visible at the left

Reports requested by congressional directives to ascertain the advisability of further improvements are also made by the corps of engineers.

Approximately 1,000 river and harbour projects were in force on June 30, 1941. The river and harbour act, approved Oct. 17, 1940, authorized additional waterway improvement at 22 localities in the interest of national defense. Improvements and maintenance operations in 1941 were underway on 377 separate projects, of which 20 projects were fully completed. Total expenditures for the fiscal year were $86,500,000, of which $45,900,000 were for new work. The total net water-borne commerce during 1940 over federally improved waterways and harbours of the United States, after eliminating all known duplications, was 607,900,000 short tons.

(*See* also Water-Borne Commerce of the U.S.)

The principal items of new work in progress during 1941 on rivers and harbours, exclusive of that covered under the title of Canals and Inland Waterways (*q.v.*), included dredging of the Delaware river channel from Philadelphia, Pa., to Delaware bay to a depth of 40 ft.; dredging to extend the harbour anchorage facilities south of the Craney island anchorage in Norfolk harbour, Va.; jetty construction at the mouth and dredging of the Calcasieu river from the Gulf of Mexico to the port of Lake Charles, La.; and completion of the upper reach of the 34-ft. Houston ship channel, Tex., including dredging of a turning basin at the head of the channel near Houston. At Buffalo harbour, N.Y., deepening a portion of the outer harbour to secure a depth of 23 ft. was in progress. Channel widening in the Cuyahoga river at Cleveland harbour, O., was substantially advanced by dredging at critical bends. Work was prosecuted under the program for a seaplane basin and enlargement of anchorage facilities for deep-draught vessels at San Diego harbour, Calif., to provide depths ranging from eight to 35 ft. Extension of the breakwater system at Los Angeles and Long Beach harbours, Calif., to provide an extensive anchorage area for deep-draught vessels was initiated. Construction operations for hydroelectric power development at Bonneville dam on the Columbia river, Wash., were vigorously prosecuted; units nos. 1–5 were completed and were in operation; unit no. 6 would shortly be put into service; and contracts were let for the construction of an equipment for units nos. 7–10, which would complete the full installation. At Fort

Peck dam, Mont., construction of the powerhouse substructure had been completed and work on the superstructure was scheduled to begin early in 1942 for the first two units of the ultimate three-unit installation. Dredging was in progress in various stretches of the Atlantic-Gulf Intracoastal waterway and authorized depths for the entire length of the waterway were essentially accomplished.

Important channel and harbour improvements were also effected at waterways and ports on the Atlantic, Gulf and Pacific coasts and on the Great Lakes, including improvement at New York and New Jersey channels; Boston harbour, Mass.; Providence river and harbour, R.I.; Fire Island Inlet, N.Y.; Raritan river, N.J.; waterway from Delaware bay to Chesapeake bay, Del. and Md.; Tampa harbour, Fla.; Southwest pass and South pass, Mississippi river, La.; Sabine-Neches waterway, Texas; Mississippi river between the Ohio river and Minneapolis, Minn.; Illinois waterway, Ill.; Missouri river between the mouth and Sioux City, Ia.; Ohio river; Keweenaw waterway, Mich.; Erie harbour, Pa.; Columbia river, Wash. and Ore.; San Juan harbour, P.R.; and Arecibo harbour, P.R. (*See* also AQUEDUCTS; CANALS AND INLAND WATERWAYS; DAMS; FLOODS AND FLOOD CONTROL.) (J. L. S.)

Great Britain.—It was not practicable at the end of 1941 to present an adequate review of the changes which had taken place in connection with docks and harbours during the year, mainly for reasons arising out of wartime restrictions. The suspension, cessation or retardation of port development and improvement programs in Great Britain, as in fact throughout the whole of Europe, continued in varying degree and the paralyzing effect of hostilities on constructional enterprise was enhanced by the havoc which was taking place incessantly in the various theatres of war. Each successive aerial bombing attack on the British and European coast line resulted in the destruction of port structures and equipment.

Apart from repairs, only minor works were feasible in Great Britain on account of the shortage of materials, and even where essential work was carried out, there were frequent delays. The most striking feature was the shift of shipping and cargoes from east coast ports to less vulnerable areas on the west coast, involving the transfer of a considerable quantity of plant and appliances.

The only regions (apart from the United States and, in some measure, Canada) in which port development schemes of importance were in progress and concerning which particulars can be given are to be found in South Africa and Australia.

South Africa.—The impressive program of harbour expansion, to cost more than £4,000,000, at Cape Town, made good progress in spite of hindrances due to the war. The original contract was for the formation of a new basin with an area of nearly 300 ac. and the provision of three deepwater berths, all to be completed by June 6, 1941. Unavoidable delays in obtaining materials and an increase in the scope of the contract were deferring completion. The three deepwater berths, however, each affording 1,000 linear ft. of quayage, were actually completed and in use. The fourth berth, subsequently decided upon, was well in hand. The new basin was to have a uniform depth of 40 ft., which would enable it to receive the largest ships in existence, including the "Queen Elizabeth." The old outer breakwater was demolished and liners of 20,000 tonnage can safely pass over the site. A new large graving dock was also contemplated, but for financial reasons was not started in 1941.

At Durban, where a new "T" jetty was in progress at an estimated cost (including certain ancillary works) of £2,500,000, the sinking of caissons for both the eastern and western walls was well advanced and more than 1,200 linear ft. of superstructure completed. The new accommodation would provide berthage for seven large ships, with berths for two others closely adjacent.

At East London, an expenditure of £500,000 was being made on the provision of a turning basin, a mail-boat quay and transit sheds.

Australia.—The new large graving dock, 1,050 ft. long by 137 ft. wide, projected for Sydney harbour at a cost of £3,000,000, was actually in hand and was well advanced in the preliminary stages. A cofferdam to enclose the site was almost, if not quite, completed. In order to facilitate constructional operations and at the same time to form the west bank of the entrance to the new dock, reclamation of 3½ ac. of water area in the harbour at Pott's Point was being undertaken and some of it was already showing above water level.

In Victoria, a series of improvements at the ports of Melbourne and Geelong, as well as changes in the administration, were the subject of a special report of the Parliamentary Public Works committee presented to the state cabinet in June. It was recommended that the entrance to Port Phillip bay should be deepened by blasting to a depth of 48 ft., the depth in 1941 being 43 ft. at low water. The report also urged that all channels leading to deepwater berths at the port should be deepened to enable them to be navigated at all tides by vessels drawing 35 ft. In 1941 the South channel had a depth of 37 ft. at low water and the Port Melbourne channel, a depth of 34 ft. It was also recommended that the Yarra river should be deepened and widened so as to be navigable by vessels drawing 31 ft. The sill formed by the Spotswood tunnel limited the depth to 27½ ft.

(B. Cu.)

Rivets, Explosive: *see* METALLURGY.

Roads and Highways. The spectacular efforts that made the Yunnan-Burma highway a life line to the Chinese armies were reported by press and radio. For a time press reports indicated the great importance of the modern Moscow-Smolensk highway in supplying a Russian sector resisting German invasion. Great Britain perfected a detailed organization of its commercial vehicles that was co-ordinated with rail transport in the rapid dispersion of food and other supplies away from ports, to lessen damage from bombing attacks.

The United States with a great network of main highways and nearly 70% of the world's motor vehicles found its highway transportation resources taxed to the limit. Conversion of labour and production facilities to defense activity required enormous movements of men, materials and supplies. All forms of transport were used in the building of camps and defense industries, in the movement of food, raw materials and supplies to these places after they were placed in operation and in the movement of products of the industries to the places of use. Without the great highway improvements made since World War I, it would have been impossible to supply the materials and feed the men being used in defense operations.

A curtain of military censorship undoubtedly hid many important highway events in the countries at war. Full facts concerning the military use of highway transport would not be known until detailed histories of the war were written but in the meantime fragments of information indicated that the existence or nonexistence of highways influence when and where battles are fought and who wins them.

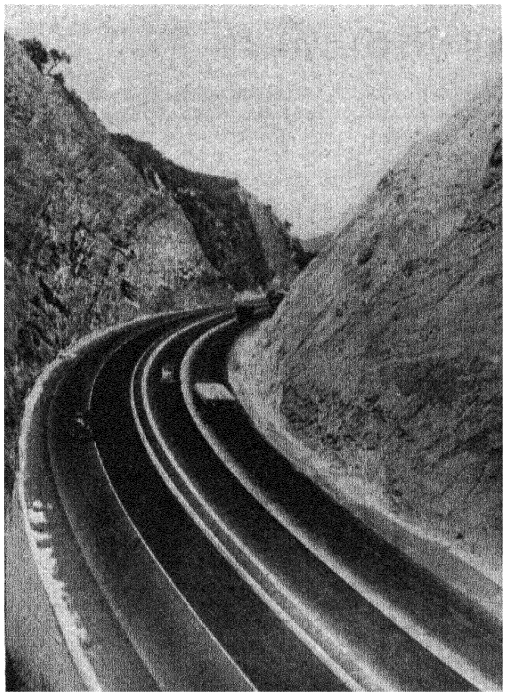
Did Hitler rush the construction of a road or roads across southern Russia to support his advance on the Crimea and the Caucasus as suggested by some reports? Did the Russians use highway transport for movement of quantities of machinery for arms production away from the area expected to be invaded? Some observers reported seeing such a movement. Are the British building highways from the Persian gulf or Mediterranean toward the Caucasus to support a front against the advancing Germans? These are some of the questions of great interest to which an answer could not be given in 1941.

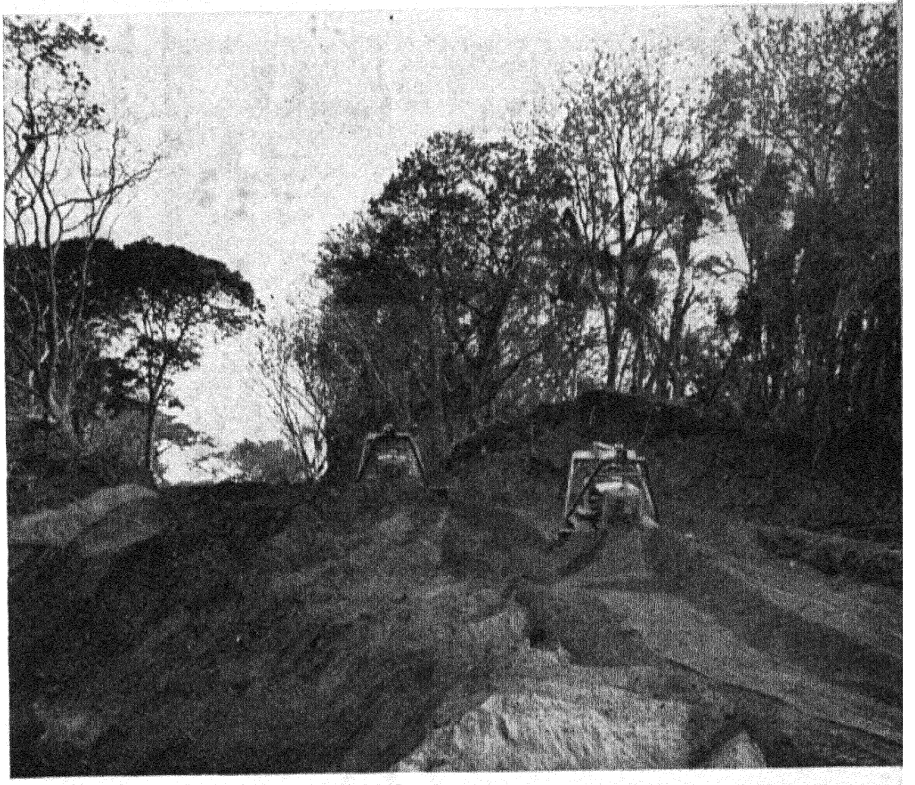
From the viewpoint of world-wide advance in highway improvement and use, the year 1941 was a disappointing one. Extension of highway networks and modernization of existing roads for commerce and promotion of general welfare was practically at a standstill in all of Europe, much of Africa and all of occupied China.

United States.—In the United States with 306,000 mi. of surfaced primary rural state highways, more than 1,000,000 mi. of surfaced feeder roads and 32,500,000 motor vehicles, highway use was greater than ever before. Total travel by vehicles probably exceeded 300,000,000,000 mi. during the year. The loads carried by trucks in 1941 were probably 24% greater than in 1939 and should reach a total of 72,000,000,000 ton-mi. on rural highways alone.

Improvement of highways went forward at a rapid rate. The mileage of surfaced rural roads was increased by about 37,000 mi. per year in 1939 and 1940 and approximately the same progress was made in 1941.

However, the most important work of the year was in the modernization of main routes of travel to make them suitable for the large volume of fast-moving traffic. Work of this kind to relieve congestion in and near cities was particularly important. Examples of such work were the improvement of the main thoroughfare through Palo Alto, Calif., Bulkley boulevard in Cleveland, O., and the belt line built around Minneapolis, Minn. Congestion and delay in small towns and cities was relieved by building alternate routes around them. Traffic between Chicago, Ill., and St. Louis, Mo., could skirt Normal and Bloomington, Ill., taking only 10 min.





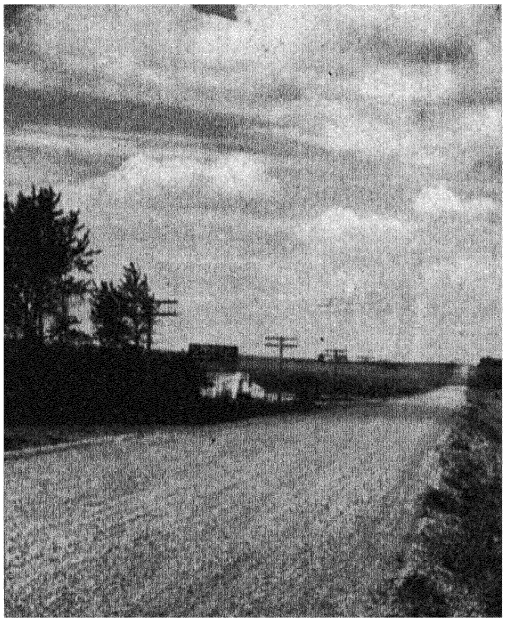
Above, left: OPEN CUT on a four-lane highway in California which replaced a narrow tunnel, formerly a serious bottleneck for traffic

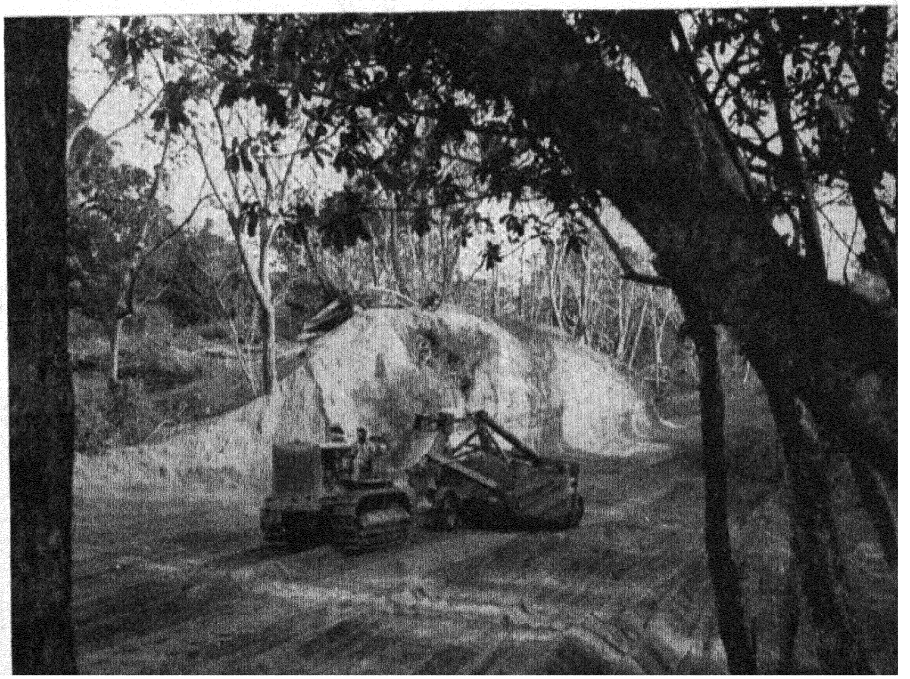
Above, right: A SECTION of the Blue Ridge parkway in North Carolina

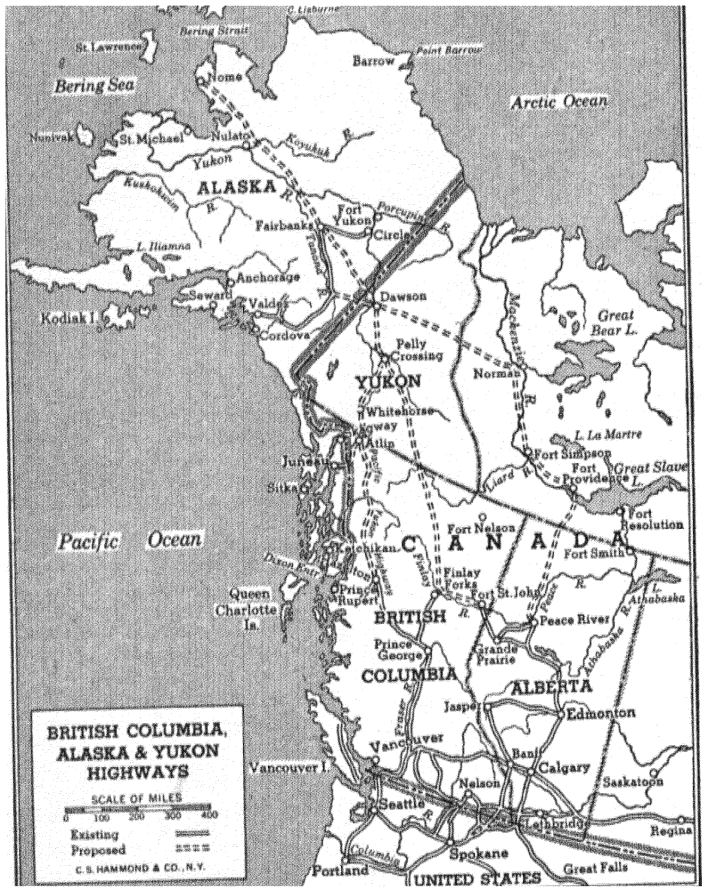
Right: BULLDOZERS at work in 1941 extending the Inter-American highway southward through the jungles of Costa Rica

Below, left: SECTION OF THE GRAVEL HIGHWAY north of Edmonton, Alberta, Canada which was under consideration in 1941 as a link in the proposed highway between the United States and Alaska

Below, right: U.S. MACHINERY levelling a section of the Inter-American highway near Managua, Nicaragua in 1941







THREE PROPOSED HIGHWAYS (shown by dotted lines) connecting the U.S. with Alaska through Canada were considered in 1941 as measures to strengthen Alaskan defenses

where it formerly took 19 min.

In the federal-aid road program and other federal highway work administered by the Public Roads administration, nearly 13,000 mi. of highway were completed in the fiscal year ending June 30, 1941. Three hundred and twenty-one highway-railroad grade crossings were eliminated, 65 obsolete elimination structures were reconstructed and 941 were protected by signals or other devices. The total cost of the work was $317,000,000, of which $177,000,000 was paid with federal funds.

After the beginning of the defense program all available federal-aid highway funds were applied to roads of special defense significance as far as could be done under existing limitations of law. Nearly 5,000 mi. of defense highways, either on the 80,000-mi. strategic system approved by the war department or access roads to camps and defense establishments, were approved for construction with federal funds.

As the year closed, $150,000,000 was authorized for the construction of roads to relieve the badly congested conditions at training camps and defense industries. Plans were already prepared and work was to begin immediately.

An important step toward the planning of an interregional highway system for improvement after defense activity is over was taken when the president appointed a National Interregional Highway committee to make studies and report to him.

Highway to Alaska.—The commission, appointed by the president of the United States to investigate the feasibility of a highway to Alaska and to consult with Canadian officials, continued its work. Various proposed routes were under discussion. Two of the routes were identical from Vancouver to Prince George, B.C. One of these proposals was to build a highly scenic route parallel to the coast but about 100 mi. inland through Prince George to White Horse, Yukon Terr., and thence to Fairbanks, Alaska. Another route from Prince George would go east of the Stikine mountains to Fairbanks. Still another proposed route would proceed from North Dakota to Edmonton, Alta., and thence to Fairbanks by the route east of the Stikine mountains or a more easterly route.

The United States commission discussed the routes with Canadian officials and recommended construction of a highway. Up to the close of 1941, Canada had not agreed to improvement of the highway and funds for detailed surveys and construction had not been authorized.

Canada.—The first transcontinental highway across Canada from Halifax, N.S. to Vancouver, B.C., 2,800 mi. in length, was expected to be opened to travel throughout its length in 1941. Grading on the last gap, lying north of Lake Michigan, was expected to be completed. Continued rains beginning in August, however, delayed completion until 1942. Canada has been drawing an increasing number of tourists from the United States each year both in eastern Canada and in the Canadian Rockies.

Inter-American Highway.—Tourists from the United States visit Mexico in increasing numbers each year. They go to Mexico City and some distance beyond, but it would be three or four years before they could reach Guatemala. There were in 1941 many sections of improved road between Mexico and Panama but no long section of improved road. Work was being done in all intervening countries and was progressing rapidly in Nicaragua, Costa Rica and Panama with loans from the United States. Between the United States and Panama City there were 2,004 mi. of all-weather road in a total distance of 3,252 mi. Between Panama City and the Colombia border, a distance of about 225 mi., there were only 38 mi. of usable road. No vehicle had up to the close of the year made the trip by land.

The South American countries have made considerable progress in selecting and improving routes on the Inter-American highway system. The route from the Panama-Colombia border to Buenos Aires, Arg., follows the Pacific coast to Vitor, Peru, from which two branches lead on to Buenos Aires. One branch follows the coast to Valparaiso, Chile, then proceeds east to Buenos Aires; the other branch turns east to La Paz, Bol., and then proceeds southeast to Buenos Aires. From the Panama boundary to Buenos Aires via Valparaiso, Chile, the distance is 5,757 mi., of which some 4,030 mi. are all-weather road. Via La Paz, Bol., the distance to Buenos Aires is 5,433 mi., of which about 3,790 mi. are all-weather road. Of the all-weather road on these routes, roughly a third is paved.

Other important routes in South America include the Simon Bolivar highway from La Guaira, Venez., to Guayaquil, Ec., and the Rio de Janeiro-Montevideo-Buenos Aires highway. The Simon Bolivar highway is 2,295 mi. long, and of this length 2,018 mi. have all-weather surfaces. From Murillo, Colom., to San Juan, Ec., a distance of about 715 mi., this highway is coincident with the Inter-American highway to Buenos Aires.

The Rio de Janeiro-Montevideo-Buenos Aires highway is 1,922 mi. long. Of this length, 960 mi. are paved and an additional 61 mi. have an all-weather surfacing. An interesting feature of this route is a 31-mi. ferry, crossing the Rio de la Plata at Buenos Aires.

Three pioneers composing the Richardson expedition left Detroit, Mich. in Nov. 1940 and after travelling 15,000 mi. over good roads, mountain trails, hacking their way through jungles and transporting their car around impassable sections, arrived at the tip of South America in July 1941.

Great Britain and Europe.—Because of the war no official information on highways was made public in 1941.

Australia.—In Feb. 1941 a road of great strategic importance in supplying the garrison at Darwin on the north coast was opened to traffic. This road runs for 450 mi. across the so-called "dead heart" of Australia. Darwin has heretofore been isolated during the rainy season except by sea. The new road gives a year-round supply line and also opens huge tracts of cattle-raising and mineral-bearing land.

The commonwealth government was spending £250,000 ($1,000,000) in reconditioning the long route along the southern coast of Australia.

China.—Roads in eastern China were severely damaged in the fighting of 1937–39 and very little had been done to repair the damage up to the close of 1941. In several instances highways reopened to traffic were so damaged by the native population as to be unfit for use. Use of roads in occupied territory is controlled by the Japanese army. In April 1941 the North China Communications company, a Japanese firm, was operating 150 bus lines over an 8,000-mi. system. Four other companies were operating lines over 4,000 mi. of highway.

Offsetting destruction of roads in eastern China was the amazing construction of new roads in western China by the Chinese National government. Western China in 1941 had more road mileage than the whole of China had before the Japanese attack. The system, with Chungking as its hub, includes 65,000 mi.

Burma Road.—Most important highway in this system is the Burma road extending from Lashio near the Burma border across Yunnan province and on to Chungking. The 610-mi. Yunnan section was opened to traffic in 1939. After Oct. 1940 this was the only route open to the sea. Japanese seizure of Indo-China threw upon this route the added burden of supplies that formerly went to the Chinese through Indo-China.

In 1941 an intensive effort was made to increase the movement of supplies over the Burma road. Transportation experts went from the United States to assist the Chinese in reorganizing the management of the road. Road machinery was sent to improve the road and additional trucks were sent. Reports on operations in the fall of 1941 showed that the tonnage transported to interior China was moving constantly upward.

The first two modern highways in Sikang province, bordering Tibet, neared completion in 1941. One of these roads reaches an elevation of 9,200 ft. or more than 1,000 ft. above the highest point on the Burma road.

(T. H. MacD.)

Roberts, Elizabeth Madox (1886–1941), U.S. novelist, was born in the Pigeon river country near Springfield, Ky., where her ancestors had migrated in the 1770s. She spent much of her youth in Colorado and did not enter college until she was an adult, graduating from the University of Chicago at the age of 35. At the university, she was elected to Phi Beta Kappa and won the Fiske prize for poetry in 1921. Miss Roberts won immediate recognition as a top-rank writer with her first novel, *The Time of Man*, published in 1926. The

book, about Kentucky poor whites, was later regarded as her best work. Among her other publications are *Under the Tree* (1922), a book of children's poems; *My Heart and My Flesh* (1927); *Jingling in the Wind* (1928); *The Great Meadow* (1930), an historical novel of Kentucky pioneer days; *A Buried Treasure* (1931); *The Haunted Mirror* (1932), a collection of short stories; *He Sent Forth a Raven* (1935); *Black is My Truelove's Hair* (1938); *Song in the Meadow* (1940), her second book of verse; and *Not by Strange Gods* (1941), a collection of short stories published four days after her death. She died at Orlando, Fla., March 13.

Robinson, Frederick Bertrand (1883–1941), U.S. college president, was born Oct. 16 in Brooklyn, N.Y. He was graduated from the College of the City of New York in 1904 and received his Ph.D. degree from New York university in 1907. He was named president of the College of the City of New York in 1927, a post he held until his resignation in 1939. He died in New York city, Oct. 19.

Rockefeller Foundation was chartered in 1913 for the permanent purpose of "promoting the well-being of mankind throughout the world." Its program is concerned with certain definite problems in the medical, natural, and social sciences, the humanities, and public health. In the field of medicine its interest is centred mainly in nervous and mental diseases, and a large part of its contributions are made for the furtherance of research and teaching in psychiatry and allied subjects. Its program in the natural sciences is concerned with experimental biology. In the social sciences the emphasis is on projects contributing not only to the understanding of important social problems, but also to the development of personnel and methods. The program in the humanities centres around the techniques by which cultural levels of contemporary society are being influenced—such as museums, the radio, drama and libraries—and the promotion of better international understanding through cultural interchanges. The program in public health includes research on a number of selected diseases; demonstrations in the control of some of these diseases in their environments; co-operation with governments in services of central or local health departments; and the development of public-health education. During 1941 the foundation appropriated approximately $9,000,000 for work in its various fields of interest. The chairman of the board of trustees in 1941 was Walter W. Stewart; the president, Raymond B. Fosdick; and the secretary, Norma S. Thompson.

General Education Board was incorporated by an act of congress in 1903, with the stated object of "promoting education within the United States of America without distinction of race, sex, or creed." Its program is restricted largely to the support of education in the southern states. During 1941 appropriations approximating $900,000 were made by the board. The chairman of the board of trustees in 1941 was Ernest M. Hopkins; the president, Raymond B. Fosdick; and the secretary, William W. Brierley. (H. B. V. W.)

Roebling Medal: *see* MINERALOGY.

Roman Catholic Church. The pope, Pius XII is recognized as the supreme spiritual ruler. In his person reside plenary power, spiritual, legislative, executive and judicial, in all matters of faith and morals. To him, the Catholic faithful throughout the world owe spiritual allegiance, as they owe full civil allegiance to their respective governments.

Appointed by the pope are the cardinals, patriarchs, archbishops, bishops, vicars who govern the ecclesiastical jurisdictions throughout the world. The cardinals, traditionally numbering 70, are the electors of the pope. Some govern archdioceses in various countries; others are resident in the Vatican, as assistants to the pope in church government. Due to deaths, and the fact that Pius XII had made no appointments, the number was in 1941, 53. As in 1941, there were 14 patriarchates, 1,210 archbishoprics and bishoprics, 512 apostolic vicariates, prefectures, abbacies and mission prelacies. In addition there were some 779 titular archbishops and bishops without territorial jurisdiction. The number of Catholics throughout the world was estimated by the Vatican, in 1941, to be in excess of 385,000,000 reaching up to 400,000,000, about 19% of the world population.

English-Speaking Countries.—In the United States, Catholics, under the inspiration of the hierarchy, co-operated fully in the defense projects, and upon the declaration of war, pledged all-out support to the nation and the government. Archbishop Stritch, as chairman of the episcopal committee on the pope's peace plan, issued a statement on Dec. 17, declaring that "victory will be a benediction for all the world," and Archbishop Mooney, chairman of the administrative board, addressed President Roosevelt, pledging "whole-hearted co-operation." By the end of 1941, it was estimated that upwards of 31% of the armed forces were Catholic, though Catholics were only about 18% of the total population. Chaplains in the army and navy, as of Dec. 31, numbered 362.

The ninth National Eucharistic congress was held at St. Paul, Minn., June 24, with Dennis Cardinal Dougherty as the papal legate. Under the direction of the Confraternity of Christian Doctrine, a revised text of the New Testament was issued, and also a revision of the Baltimore catechism. Denver, Colo., was raised to the rank of an archdiocese; Pueblo, N.M., and Honolulu were erected into dioceses. The wide-spread activities of the church in the United States were directed by the National Catholic Welfare council.

The official figures of the Catholic population in the United States and its possessions were placed at 22,293,101, an increase of 889,965 since 1940. Bishop Noll, in November, estimated the total at 35,000,000. There were 116 archdioceses, dioceses and vicariates. The hierarchy consisted of 2 cardinal archbishops, 23 archbishops, 123 bishops. The parishes with resident clergy numbered 13,224; to these were attached 5,897 mission centres. The total of priests, diocesan and religious, increased to 35,839.

In Great Britain and the commonwealth, with the exception of Eire, which maintained neutrality, Catholics united in the total war against the axis powers. The Lenten pastorals of the English bishops dealt with the social and economic problems, during and after the war, and urged a peace based on papal principles. A movement initiated by Cardinal Hinsley, the Sword of the Spirit, sought to unite all Christians in the defense of Christianity against the aggressive paganism of the totalitarian ideologies. Though accepting a military and economic alliance with the soviets, the Catholic leaders urged that communism be opposed. Many churches and religious institutions were destroyed by the nazi bombers. Numerous conversions were reported. Catholic life was active in an extraordinary degree.

In England and Wales, the number of Catholics was estimated at 2,414,000, an increase of 7,583; in Scotland, at 614,469; in northern Ireland, 428,290; in Eire, at 3,013,701. Ecclesiastical jurisdictions were as follows: England and Wales, 4 archdioceses and 14 dioceses; Scotland, 2 archdioceses and 4 dioceses; Eire, 4 archdioceses and 25 dioceses.

Cardinal Villeneuve, in April, appealed for unity in the war effort of Canada, thus giving impetus to the Catholic contribution. The Knights of Columbus (*q.v.*) and the Catholic Women's

League collected for, and aided the men in service, and helped provide for more than 200 Catholic chaplains. Australian and New Zealand Catholics were heavily engaged in war efforts. In the former, the hierarchy planned a unifying agency such as the National Catholic Welfare conference in the United States.

The Catholic population of Canada was estimated to be 4,745,882, an increase of 121,200; the number of clergy was 8,850. The country was divided into 12 archdioceses and 36 dioceses and vicariates. Catholics in Australia and New Zealand totalled 1,723,802, living under the jurisdiction of 30 archbishops and bishops.

Hispanic America.—On the whole, Catholic authorities were agreeable to establishment of better relations with the U.S. In Mexico, Catholics were heartened by the Avila Camacho government to the extent that Archbishop Martinez, Mexico City, in November, could commend the president for having made "notably easier the situation of the Catholic Church in Mexico." In Santiago, Chile, was held a national Eucharistic congress that attested to the inherent Catholicism of the people. Notables from all of South America and from the United States were present. Argentine Catholics were most active in social, economic and moral programs. The hierarchy issued a joint pastoral urging justice toward the working classes. The Brazilian bishops published a joint pastoral asking prayers for the peace of Christ, seeking higher moral standards, condemning indecency in books, magazines and motion pictures. At Rio de Janeiro was opened the Catholic University of Brazil, authorized by the plenary council of 1939. In Colombia, progress was reported on the proposed concordat with the Vatican. In Venezuela, controversy over religious instruction in the state schools veered in favour of the Catholic viewpoint. A Catholic radio station was inaugurated. The Nicaraguan congress' legislation making civil marriage compulsory, giving preference over religious ceremonies, was protested by Catholic bishops.

Europe.—In Italy, a continued revival of spiritual values was manifest. There were no major conflicts between the government and the church. In the axis partner, Germany, however, the persecution and suppression of Catholicism was intensified. Several documents were issued, under alleged nazi influence, decreeing the practical extirpation of all Christian religion. A pastoral by the German bishops cited four major protests: suppression of Catholic publications; disbanding of religious institutes and convents; closing of Catholic schools and prohibition against religious teaching in those remaining open; nazi propaganda seeking Catholic apostasy. Bishop von Galen, of Muenster, in a series of sermons, denounced the methods of the gestapo against Catholics, as did Bishop Bornewasser, of Trier. Archbishop Groeber, of Freiburg, declared that the war had increased the persecution of the church in Germany.

In the countries under nazi domination, the church suffered the same ill treatment. In the Germanic countries, Catholic organizations were rendered impotent, even in spiritual affairs, schools and religious institutes were suppressed, religious properties and funds were seized, religious services were curtailed and priests arrested. In Holland, the bishops issued three strong pastoral letters: the first, warning against Catholic participation in nazi and communist movements; the second, denouncing nazi usurpation or suppression of Catholic organizations; the third, refusing the sacraments to members of nazi groups. In Belgium, protests against nazi methods and restrictions were likewise voiced. The church in Poland suffered excruciatingly, in its dismemberment by the soviets and the nazis, and then under complete nazi domination. Reports on the horror of executions, imprisonments and confiscations were made by Cardinal Hlond, primate of Poland, from the Vatican. Arrests of clergy and closures of institutions were likewise reported from Yugoslavia and the Balkans. Although not numerically strong in the Scandinavian nations, the church was hampered in its spiritual and moral mission.

In the U.S.S.R. because of the religious restrictions in the constitution, and the Marxist hostility to religion, Catholicism was almost nonexistent. The Vichy government of France, despite axis pressure, attempted the reconstruction of the free areas on Christian principles, thus abrogating much of the legislation of the Third Republic. Spain, also under nazi threat, struggled to mend the spiritual, economic and social ill effects of the civil war. Portugal, maintaining its independence, increased in Catholic activity. The statutes concerning the colonial missions, stemming from the 1940 agreement with the Vatican, were put in force.

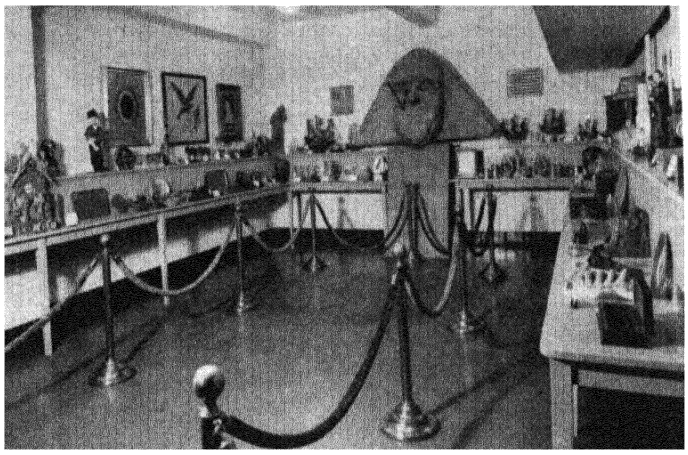
The Mission Countries.—The spread of the war in the Pacific rendered uncertain the future of the widespread mission activity. Japan recognized the legality of the church, and the Vatican adapted Catholic activities to the Japanese policy; all ecclesiastical jurisdictions were entrusted to native Japanese. In China, conversions continued; in the year ended August 1941, 103,900 were reported. Chinese seminarians numbered 7,028, an increase of 315. Progress was made in India, in the organization and increase of Catholicism. Favourable reports also indicated the spread of the church in Asia and throughout Africa. Since the support of the missionary establishment had been seriously cut, and since the missioners, belonging to so many varied nations, had been obstructed by governments, and since the Japanese domination was spreading, there were few bright hopes at the close of 1941 for the continuance or the expansion of missionary labours and successes. (*See* also PIUS XII; VATICAN CITY STATE.) (F. X. T.)

Rommel, Erwin (?–), German army officer, fought on the western front and the Italian front in World War I. He left the army after the war, but found the student life at Tuebingen university too dull. He joined the postwar Reichswehr and fought as a storm-troop leader in the nazi party. He advanced rapidly in the German army and his brilliant strategy and tactics in mechanized warfare won him early recognition. In the battle of France, Rommel's tank units smashed through the Maginot line at Sedan in May 1940 and swept to the coast at Abbeville, closing a ring around 1,000,000 Allied soldiers in northern France and Belgium. He was made commander of the German desert forces in 1940 to bolster the crumbling Italian armies in Libya. He launched a counterdrive in Cyrenaica in March 1941, hurling Allied forces back across the Egyptian border and holding a defense line near the Libya-Egypt border throughout the summer. The British struck again on Nov. 18, 1941, with a large mechanized army, and while Rommel slowed the attack in the early stages British superiority in arms and numbers and his own inadequate supplies caused his armies to fall back beyond Bengasi, which was taken on Christmas day, 1941.

Roosevelt, Franklin Delano (1882–). (See *Encyclopædia Britannica* for extended biography.)

On Jan. 6, 1941, in his annual message to congress, President Roosevelt emphasized the need for stronger national defense and greater material help for the nations resisting axis aggression, and called for a new world order based on the "four freedoms"—freedom of speech and worship, and freedom from want and fear.

On Jan. 8, 1941, the president submitted to congress a budget of $17,485,528,049 for the next fiscal year, of which $10,811,000,000 would be used for defense purposes. To pay part of the costs of armament expansion and lend-lease aid he proposed additional taxes. The budget message estimated at $9,000,000,000 the deficit for the next fiscal year, and suggested a cut of 15% in the non-



THE ODDITIES ROOM of the Roosevelt library at Hyde Park, N.Y., opened June 30, 1941, houses items received or collected by the president. A favourite is the pulp caricature which dominates one end of the room

defense and nonfixed expenditures of the federal government.

Throughout 1941, Mr. Roosevelt devoted much time to the grave international problems that confronted the country.

The president was inaugurated for a third term on Jan. 20. Chief Justice Hughes administered the oath. In keeping with the times, the armed forces provided most of the units taking part in the traditional inaugural parade.

To assure an uninterrupted flow of munitions and other materials to Great Britain, China and other countries fighting aggression, the president asked congress for a new lend-lease authorization. This request was approved by the house on Feb. 8 by a vote of 260 to 165, and by the senate on March 8, by 60 to 31. Passage of the lend-lease bill over strong Republican and noninterventionist opposition represented a major victory for the president.

With the approach of spring, the war in Europe took a turn increasingly unfavourable to Great Britain and her allies. In April, the Germans launched a blitzkrieg invasion of Yugoslavia and Greece, and the British evacuated Crete. The nazi gains in Europe led to increasing discussion in the United States of the need for navy convoys to assure deliveries of lend-lease supplies overseas, and they resulted also in a demand for a speed-up in production of munitions. On April 20, the president announced an agreement between Canada and the United States for cooperation in the production of war materials for Great Britain.

On June 12, the president sent to the senate the nomination of Associate Justice Harlan F. Stone (*q.v.*) as chief justice of the supreme court of the United States, to succeed Charles Evans Hughes, who had retired after presiding over the court for 11 years. The president made two appointments to the Supreme court in 1941—Senator James Francis Byrnes (*q.v.*) of South Carolina, nominated on June 12, and Attorney-General Robert H. Jackson, named on June 19. On Sept. 5, the president nominated Solicitor General Francis Biddle (*q.v.*) to succeed Mr. Jackson as attorney-general.

On June 9, the president ordered the army to take over the strike-bound North American Aviation company's plant in California. The same day, it was announced that the American freighter "Robin Moor" had been torpedoed by a German submarine about 1,000 miles off the coast of Brazil. Five days later, Mr. Roosevelt ordered the immediate freezing of the assets in the United States of Germany, Italy and all invaded and occupied countries. In a special message to congress on June 20, he denounced Germany as "an international outlaw" and warned that the U.S. would insist that Germany make full reparation for the sinking of the "Robin Moor."

Without a declaration of war, Germany, on June 22, invaded soviet Russia. Two days later, the president pledged all possible material assistance to Russia. On July 7, United States forces landed in Iceland, and on July 10, the president asked congress for funds to equip an army of 1,200,000 men. On July 30, the president requested congress for price control legislation. The federal government needed authority to control prices, he pointed out, not only to strengthen national defense, but to protect the United States against the evils of inflation. Although the house passed a price control bill, the senate took no action in 1941, with the result that enactment of this important legislation was postponed until 1942.

After several days of rumour, lacking official confirmation, it was announced on Aug. 14, that President Roosevelt and Prime Minister Winston Churchill, with high-ranking political, military and naval aides, had conferred at sea. At this meeting, the two leaders drew up the Atlantic charter, which contained an eight-point declaration of peace aims. For Atlantic charter, *see* DEFENSE, NATIONAL (U.S.).

Relations between the United States and Germany became increasingly strained in September. The United States destroyer "Greer" was attacked by a German submarine on Sept. 4, while on patrol duty off Iceland. Three days later, the U.S. freighter "Steel Seafarer" was sunk in the Red sea by a German submarine. In a radio address on Sept. 11, the president announced that the navy had been ordered to "destroy on sight any German or Italian submarines entering waters, the protection of which is necessary for American defense." On Sept. 18, he requested congress to appropriate an additional $5,985,000,000 for lend-lease aid.

On Oct. 9, the president asked congress to amend the Neutrality act, to permit the arming of U.S. merchant ships and to authorize their entry into combat zones.

Labour troubles continued to cloud the domestic horizon. On Oct. 25, John L. Lewis, president of the United Mine Workers of America, called a strike in the captive coal mines of the seven largest steel companies. The principal issue was the union demand for complete unionization of the workers in the mines. Following three requests by the president, Mr. Lewis, on Oct. 30, agreed to call off the strike until Nov. 15, pending an investigation of the merits of the controversy by the National Defense Mediation board. By a vote of 9 to 2, the board, on Nov. 10, rejected the demands of the union for a closed shop. Six days later, union officials ordered 53,000 men in the captive mines to go on strike and threatened to call out 400,000 more workers in the bituminous coal mines. On Nov. 22, Mr. Lewis accepted the proposal of the president for arbitration of the closed shop issue and called off the strike. The president appointed three arbitrators —Benjamin Fairless, chairman of the board of the United States Steel corporation; John L. Lewis, and John R. Steelman, director of the United States Conciliation service. Reversing the findings of the Defense Mediation board, the arbitrators, on Dec. 7, granted the union the closed shop.

To formulate a program to prevent work stoppage during the emergency, the president called a meeting of labour and industrial leaders in Washington, D.C., under the chairmanship of William H. Davis, head of the Defense Mediation board. On Dec. 23, the president accepted the report of this group. This included an agreement by labour not to call strikes during the war and to settle industrial disputes by peaceful means. It was also proposed to set up a war labour board. A threatened nation-wide railway strike was averted on Dec. 1, by an agreement to increase the wages of rail workers by $300,000,000.

On Dec. 7, while discussions were still in progress between Secretary Hull and the "peace" envoys of the Mikado, Japan de-

clared war on the United States after a surprise attack on Pearl Harbor and other United States outposts in the Pacific. Following a special message by the president, congress the next day declared war on Japan. Acknowledging the seriousness of the losses at Pearl Harbor, the president on Dec. 9 called upon the American people to prepare for a long and hard war. He named a special board, headed by Associate Justice Owen J. Roberts of the supreme court to investigate the Pearl Harbor attack, and determine whether or not there had been negligence on the part of the U.S. naval and military commanders in Hawaii. (*See* also UNITED STATES; JAPAN.)

On Dec. 22, Prime Minister Churchill, accompanied by Lord Beaverbrook and British air, military and naval chiefs, arrived in Washington. Mr. Churchill had Christmas dinner with the president at the White House and joined with him in a Christmas message to the American people. On the following day Mr. Churchill addressed congress. In the closing days of 1941, the president, with leaders of Great Britain and those of other nations fighting the axis, canvassed the problems of grand strategy in the conflict that had now become a global war.

In conference with members of congress and administration officials, Mr. Roosevelt also mapped out a program designed to secure, as quickly as possible, the full mobilization of the economic and military resources of the United States. (O. McK.)

Roosevelt, Gracie Hall (1891–1941), U.S. electrical engineer and brother of Mrs. Franklin Delano Roosevelt, was born June 28 in Neuilly, France. A graduate of Groton, he studied electrical engineering at Harvard, where he received his degree in 1914. After working at his profession in the Yukon, he returned to the United States, where he joined the General Electric company. During World War I he was a flying instructor in the army air corps. After the armistice he rejoined the General Electric company. He was executive vice-president of the Detroit United railways and vice-president of the American State bank in Detroit, 1929–30. From 1932 to 1938 he worked as a consulting engineer in Chicago, Detroit and New York city. He died in Washington, D.C., Sept. 25.

Roosevelt, Sara Delano (1854–1941), mother of Franklin Delano Roosevelt, was born Sept. 21. Sara Delano was one of five daughters of Warren Delano 2nd, whose father owned a fleet of whaling vessels and engaged in the Chinese clipper trade. She was descended from an old French Huguenot family whose first member, Philippe de la Noye (he later changed his name to Delano), settled in the Pilgrim colony in 1621. Sara Delano was educated by private tutors and studied in Paris and Berlin. In 1880 she married James Roosevelt, a noted sportsman and railroad lawyer. They went to live on his estate at Hyde Park, N.Y., where their only child, Franklin Delano Roosevelt, was born two years later. She was the first woman since Mary Washington to see her son chosen president. Mrs. Roosevelt was a frequent visitor to Europe, entertained the president's renowned guests at her home in Hyde Park with informal ease and talked proudly of "my boy Franklin," though she carefully avoided political subjects. Her book *My Boy Franklin*, written in collaboration with two other authors, was published in 1933. Mrs. Roosevelt died at her Hyde Park home, Sept. 7.

Rosenwald Fund, The Julius. The Rosenwald fund differs from other large U.S. foundations in that the trustees not only are permitted to spend capital as well as income at any time but are compelled to expend all its funds within 25 years of the death of its founder, that is, before Jan. 6, 1957. During the 24 years since its establishment in 1917 by Julius Rosenwald, this fund has expended approximately $17,000,000, being all of its income from year to year and about four-fifths of its principal fund. At the close of the fiscal year June 30, 1941, the assets of the fund (held chiefly in capital stock of Sears, Roebuck and Co. of Chicago) had a value of approximately $4,000,000.

The chief program of the fund during its early years was aid in the building of rural public schools for Negroes. The main programs in 1941 were (1) improving the content and quality of rural education in both white and Negro schools in the south; (2) aid in building up four important centres of higher education for Negroes: Howard university in Washington, D.C., Atlanta university in Atlanta, Ga., Fisk university in Nashville, Tenn. and Dillard university in New Orleans, La.; (3) efforts in behalf of Negro health; and (4) a series of fellowships for Negroes and for white southerners.

During the year 1940–41 the fund expended $770,000 upon these and related programs.

Rotary International. During the year 1941, Rotary's loss of clubs and members in subjugated countries was offset by expansion, particularly in the western hemisphere. On Dec. 31, 1941, there were approximately 5,100 Rotary clubs with a membership in excess of 211,000 in more than 50 geographical regions of the world. General officers for the fiscal year 1941–42 (term ending June 30, 1942) were: president, Tom J. Davis, Butte, Mont., U.S.A.; vice-presidents, T. A. Warren, Wolverhampton, England; Joaquin Serratosa Cibils, Montevideo, Uruguay; A. S. FitzGerald, Windsor, Canada; secretary, Chesley R. Perry, Chicago, Ill., U.S.A.; treasurer, Rufus F. Chapin, Chicago, Ill., U.S.A. During 1941, an international convention was held in Denver, Colo., U.S.A.; 200 "Institutes of International Understanding" were presented by U.S. Rotary clubs in community forums and in high schools; in addition to their usual service activities, Rotary clubs throughout the world engaged in activities for the alleviation of war suffering and in intensified national service activities in their respective countries; a series of 14 weekly international radio broadcasts called "The Americas Speak" was presented by Rotary International as a contribution to friendship and understanding among the countries of the Americas. Rotary International publishes *The Rotarian* in English and *Revista Rotaria* in Spanish. In addition there were, in 1941, 15 regional Rotary magazines published throughout the world in 12 languages. (C. R. P.)

Rottenstone: *see* ABRASIVES.

Rourke, Constance Mayfield (1885–1941), U.S. writer, was born on Nov. 14 in Cleveland, Ohio. After teaching English for five years at Vassar, she left that institution in 1915 to devote herself to writing. Miss Rourke specialized in gathering material from firsthand sources and in the course of her travels in the U.S. she interviewed Americans in all strata of society. Her "living research" yielded fruitful material on American ballads, songs and folk tales, on which she based many of her books. Among her works are *Trumpets of Jubilee* (1927); *Troupers of the Gold Coast, or the Rise of Lotta Crabtree* (1928); *American Humor—A Study of the National Character* (1931); *Davy Crockett* (1934); *Audubon* (1936); and *Charles Sheeler: Artist in the American Tradition* (1938). She died in Grand Rapids, Mich., March 23.

Rowell, Newton Wesley (1867–1941), Canadian politician and jurist, was born

Nov. 1 in Middlesex county, Ontario. A leader of the Liberal party, he served in the Ontario legislature and also served in the federal government. He was chief justice of Ontario, 1936–38. Justice Rowell died in Toronto, Ont., Nov. 22. (See *Encyclopædia Britannica.*)

Rowing. The University of Washington and Harvard university took the major honours in American intercollegiate rowing during the 1941 season. The eight-oared varsity crews representing these two schools were the only college crews to finish an undefeated season.

The University of Washington, rowing the fastest three-mile race that had ever been rowed on the west coast, won the Pacific coast championship. They won the varsity race at Poughkeepsie, N.Y., defeating California a second time and finishing far ahead of the eastern crews. This crew was one of Washington's greatest crews and was considered by many experts to have been the fastest U.S. crew to take the water during 1941.

Harvard's fine crew was on a par with the Washington boat. They opened their season against Massachusetts Institute of Technology and Boston university with an easy victory and then went on to win the sprint championship of the east with victories over Princeton, U.S. Naval academy, University of Pennsylvania, Cornell and Syracuse. They finished their season with an impressive victory over Yale at New London, Conn. This Harvard crew took its place in rowing history as one of Harvard's fastest crews.

Following is a brief summary of the major college races of the year:

April 19, Washington *v.* California. Three miles on the Oakland estuary, California. Washington led from the start and won by three lengths. Their time of 14:28 was a new Pacific coast record for three miles.

Princeton *v.* Navy. One and three-quarter miles at Annapolis, Md. This was a close race all the way, Princeton pulling ahead in the last half to win by a length. Time 9:36.

Columbia *v.* Rutgers. One and one-half miles on the Harlem river, N.Y. Rutgers took a slight lead in the early part of the race, Columbia winning by a quarter length. Time 6:53.6.

April 26, Columbia *v.* Navy. One and three-quarter miles at New York city. Very close race all the way, Columbia winning by two feet. Time 7:24.4.

Yale *v.* Syracuse. Two miles at Derby, Conn. Syracuse led over most of the distance, Yale sprinting to a third-of-a-length win. Time 10:36.

Rutgers *v.* Pennsylvania. Henley distance (1 5/16 mi.) at Philadelphia, Pa. Close race all the way, Rutgers winning by a scant length. Time 6:30.2.

April 29, Harvard, M.I.T., Boston university (Rowe cup). Henley distance at Cambridge, Mass. Easy two-length victory for Harvard, M.I.T. second. Time 6:56.2.

May 3, Navy *v.* Cornell. One and three-quarter miles at Annapolis, Md. Close race from the start. Navy won by a third of a length. Time 9:09.

Columbia, Pennsylvania, Yale (Blackwell cup). Henley distance at Philadelphia, Pa. Close race with Columbia winning in the sprint, a deck-length ahead of Penn. Time 6:24.

Harvard, Princeton, M.I.T. (Compton cup). One and three-quarter miles at Cambridge, Mass. Harvard took the lead shortly after the start to win by open water over Princeton. Time 9:22.4.

May 10, Princeton, Columbia, M.I.T., Pennsylvania (Childs cup). One and three-quarter miles at Princeton, N.J. Princeton overcame a slight Columbia lead to finish better than a length ahead of Columbia, M.I.T. third. Time 9:35.4.

Syracuse *v.* Cornell. Two miles at Syracuse, N.Y. Syracuse won by a fifth of a second in a race that saw the lead change several times. Time 11:25.2.

May 17, Syracuse *v.* M.I.T. Two miles at Syracuse, N.Y. Syracuse again won a close hard-fought race by only a tenth of a second. Time 11:38.

Harvard, Navy, Penn (Adams cup). One and three-quarter miles at Annapolis, Md. Harvard trailed at the start with Navy leading. Harvard took the lead entering the last half mile and won by a half-length with Navy in second place. Harvard's winning time of 8:24.4 established a new cup record and also a new course record.

Cornell, Princeton, Yale (Carnegie cup). Scheduled for two miles at Ithaca, N.Y. The race was cancelled on account of rough water.

Dad Vail regatta. Henley distance at Marietta, Ohio. Won by Rutgers with Marietta second. Time 6:36.

Joe Wright cup for lightweight crews. Henley distance at Cambridge, Mass. Won by Harvard, Princeton second. Time 6:40 (new course record).

May 24, Harvard, Princeton, Cornell, Syracuse. One and three-quarter miles at Cambridge, Mass. Harvard led after the first quarter winning by two lengths, Princeton second, with Cornell third. Time 9:23.

June 13, Harvard *v.* Yale. Four-mile downstream at New London, Conn. Harvard took the lead at the start and gradually increased it to about three lengths at the halfway mark. There was very little change in the relative position of the two crews in the last two miles. Time, Harvard 20:40, Yale 20:53.4.

June 25, Poughkeepsie regatta. Four miles on the Hudson river at Poughkeepsie, N.Y. Washington and California had open water on the eastern crews within the first mile. They then went on to fight it out for first place during the next two miles. Washington was definitely in the lead just before entering the last mile and went out to win, two and one-half lengths ahead of California. The other crews in the race finished in the following order: Cornell, Syracuse, Princeton, Wisconsin, Rutgers, M.I.T., Columbia. Time, Washington 18:53.3, California 19:02.2. California won the junior varsity race and Cornell the freshman race. (E. O. Le.)

THE CREW OF REED COLLEGE, Portland, Ore., was distinguished in 1941 as having the only girl coxswain in collegiate rowing

Ruanda and Urundi: *see* Belgian Colonial Empire; Mandates.

Rubber and Rubber Manufacture. During 1941 the national defense program directed development efforts of all rubber manufacturers toward supplying the armed forces with necessary equipment on land, on the sea and in the air. Even before the declaration of war against the axis powers, certain secrecy orders were issued banning publicity concerning inventions in fields deemed of vital concern to national defense; and, after the opening of the war, these restrictions were extended further and made more rigid.

Certain achievements may, however, be indicated. One of the most important was the general conservation of supplies of crude rubber from the far east by the entire industry. This was done in several ways: by increased use of rubber from American (guayule) sources (*see* below); by increased use of synthetic rubbers; by greater use of reclaimed rubber; by eliminating white sidewalls on tires and by simplification through discontinuance of special varieties of hose, belting and other goods. At the same time the government's efforts to increase the reserves of crude rubber in the United States were successful in giving the country, at the beginning of 1942, a stock pile aggregating as much rubber as had been utilized in any year for a decade preceding 1940. Furthermore, though specific figures may not be cited, plans were revised for the production of synthetic rubber of the non-oil-resistant type suitable for tires, belting and other products, in order to provide as quickly as possible increased amounts for all rubber manufacturers. Consideration was also given, both by governmental and private agencies, to plans for obtaining additional rubber from plants grown on the American continents. None of the plantation schemes proposed were expected to supply any considerable quantity in 1942. The rubber industry also made needed economies in the use of zinc oxide and of vegetable oils and the fatty acids derived from them. The urgent need of defense materials effectively precluded the invention of new products for civilian use.

During 1942 restriction of the greater part of available rubber

to war needs would require drastic changes in production and selling activities. Many types of goods would probably be rationed and regulations devised for prolonging the serviceable life of articles previously in use. Retreading of tires, regulating the speed at which automobiles might be operated, repairing of articles hitherto discarded without any attempt at repair, and other methods might be necessary to conserve the United States' supply of rubber, natural and synthetic. It is possible that public disclosure of developments in the rubber industry might not be permitted for the duration of the war. During that period, however, new materials and processes would be developed and new knowledge acquired which would enable the industry better to serve peacetime needs when the struggle ceased.

Guayule Rubber.—In view of impending curtailment of supplies of rubber from the far east, it was urged during 1941 that guayule rubber be produced within the United States. It is obtained from a shrub, *parthenium argentatum*, growing wild in semiarid sections of Mexico and southwestern United States. It is not a new product. It has been available commercially for more than 30 years whenever the price of other grades has been sufficiently high to permit its profitable production in Mexico.

The rubber is obtained by masticating in water entire plants pulled from the ground. The woody portions become waterlogged and sink, whereas the rubber, which forms short cylindrical "worms," floats and is readily separated. Guayule rubber, thus produced, contains 20% to 25% of soft, resinous material in contrast with a resin content of hevea grades of from 1% to 3%; and it is not the equivalent of plantation rubber either in processing properties or in the quality of vulcanized compositions in which it is substituted directly for other grades. It is therefore used in small percentages with other rubber, either crude or reclaimed. Passenger car tires made entirely of compositions of guayule rubber tested some years ago yielded about 60% of the mileage of the same-sized tires then marketed. In high speed or heavy duty service the ratio might well be considerably less. Between 1907 and 1910 when the difference in cost of guayule and of other grades of rubber was 35 cents to 50 cents a pound, rubber goods manufacturers found it profitable to produce for their own use partially deresinated guayule rubber and most of that used during those years was thus prepared. Later, the costs of crude rubber were too low to permit profitable production of low-resin guayule rubber. If the resin content were reduced to 5% or less, it is probable that products of high quality could be made of this material.

Excellent experimental work was done at Salinas, Calif., in breeding high-yielding varieties of the shrub and in determining the most economical cycle of production. Four-year-old plants were recommended. This would involve a five-year cycle, inasmuch as the land lies fallow one year between harvesting and replanting. The yield indicated by W. B. McCallum, who carried out the botanical studies, was 330 lb. per acre per year. It was proposed to grow guayule in certain sections of California where soil and sparse rainfall are favourable. Irrigation increased the size of the shrub but greatly decreased the rubber content.

This project was but one phase of a comprehensive program to obtain sufficient rubber to supply American needs. Establishing plantations of hevea trees in Central and South America was another phase and the production of synthetic rubber in the United States was a third. In the emergency facing the United States all should be started promptly even though one or more might prove uneconomical in time of peace. (*See* also CHEMURGY.)

Table I.—*Imports of Rubber to the U.S.** (In long tons)

	1941 (9 mo.)	1940	1939	1938
Gross imports	739,678	780,820	469,803	397,620
Re-exported	4,177	7,060	13,125	5,652
Net imports	735,501	773,760	456,678	391,968
Rubber in latex	20,775	33,789	27,438	11,878
Guayule rubber	3,536	3,634	2,232	2,485
Total net imports	759,812	811,183	486,348	406,331

*Source: *Rubber Age* (New York).

Figures from the same source indicating stocks of crude rubber on hand in the United States and afloat for America follow: (Totals are given; there is no breakdown of "On hand" and "Afloat" quantities.)

Table II.—*Stocks of Crude Rubber in U.S. in 1939-41*

End of	1941	1940	1939
January	462,580	229,589	268,937
February	457,327	241,280	263,696
March	478,375	248,490	257,733
April	483,251	255,202	245,992
May	506,603	258,245	242,026
June	514,607	273,451	224,767
July	527,520	315,084	218,440
August	536,509	336,046	218,746
September	615,440	358,485	205,134
October	627,344	402,190	219,904
November	.....	408,507	219,249
December	.....	434,814	216,895

After the attack on Pearl Harbor, the statement was made that the United States had 540,000 tons on hand and 110,000 tons afloat. The interesting fact is that at the end of 1941 there was as much crude rubber available in the United States as was used in any one year, excepting 1940 and 1941. (*See* also BUSINESS REVIEW.) (J. W. Sc.)

Rubens, Horatio Seymour (1869–1941), U.S. lawyer, was born June 6 in New York city. After finishing his law studies, Rubens clerked in the office of Elihu Root. Interested in Spanish-American affairs, he became general counsel for the Cuban junta, formed in New York in 1895 to press for Cuban independence from Spain. He described his role in the ensuing struggle in his book, *Liberty, the Story of Cuba* (1932). He was appointed a colonel in the army of Cuba and in later years headed several railroad companies there. He died in New York city, April 3.

Rugby: *see* FOOTBALL: *Great Britain.*

Rulers: *see* PRESIDENTS, SOVEREIGNS AND RULERS.

Rumania. A kingdom in southeastern Europe. Area on Jan. 1, 1941 *c.* 74,000 sq. mi.; pop. *c.* 16,000,000. Capital, Bucharest. Principal cities: Bucharest (648,162); Yassy (104,471); Galatz (102,232); Timisoara (89,872). Religion, mostly Greek Orthodox. King: Michael; prime minister, Gen. Ion Antonescu (*q.v.*).

History.—Rumania had suffered violent upheavals and dismemberment of her territory during 1940. In the year 1941 the upheavals continued for some time, but later on the country found itself involved in a war with the soviet union which brought great territorial gains to Rumania, though by the end of the year the new acquisitions were not yet clearly defined, while the discontent of the people continued and the country was far from having entered a period of order or normality within the "new order" which had been imposed upon her. By the end of Jan. 1941 a serious revolt broke out, led by the native fascist legion, the Iron Guard, the followers of the executed leader Corneliu Zelea Codreanu. The revolt was under the leadership of some foremost members of the government itself, among them vice-premier Horea Sima. Also Corneliu's father, Ion Codreanu, played a prominent part. The minister of the interior, Gen. Constantin Petrovicescu, was also involved; he had been replaced immediately before the outbreak by the military commander of Bucharest, Gen. Demeter Popescu.

The Antonescu dictatorship was accused by the Iron Guard, which embraced most of Rumania's youth, younger officers and many priests, of having sold out the country to the Germans. The fighting between the heavily armed Iron Guardists and loyal troops lasted for several days. It was accompanied by ferocious pogroms against the Jews, of whom many hundreds were killed. After three days of fighting Bucharest was again in the hands of the government, but rebel units held out for a short while at Brasov, Ploesti, Arad and Constanza.

While Horea Sima succeeded in escaping, Antonescu, with the help of the Germans, threatened the insurgents with death and tightened his grip on the country. The real rule in the country passed to the German minister, Baron Manfred von Killinger. In a manifesto of Jan. 25, Antonescu declared to the nation that "in these days of greatest sadness I have behind me the loyal shadow of the great fuehrer and the honour of German might which guaranteed our borders." He accused the chiefs of the Iron Guard, with whom he had established the fascist regime in Rumania by the coup d'état of Sept. 6, 1940, of ingratitude and of unspeakable atrocities. On Jan. 27, Antonescu formed a new government consisting mainly of high ranking army officers and close personal friends, and announced his intention to develop a closer community of spirit between the axis and Rumania. All important private industries were brought under military

TO WIDOWS of Rumanian troops killed during the uprisings of Jan. 21–23, 1941, Premier Ion Antonescu personally distributed rewards at a ceremony in Bucharest

control. The German government insisted that in view of the international situation all internal conflicts in Rumania be firmly suppressed. Many high-ranking officials, officers and diplomats who had been members of the Iron Guard were dismissed and imprisoned. On Feb. 6 Antonescu established the most drastic criminal code in threatening death penalties for most infringements of internal order. Writing antigovernment articles or singing political songs became punishable by death; from one to five years' imprisonment was provided for parents whose children were convicted of crimes. Thus the native fascist movement with its Rumanian aspirations was fiercely suppressed in the interests of Germany, which during February made the country the base from which to start its Balkan war activities.

On Feb. 10 Great Britain severed diplomatic relations with Rumania in view of the occupation of the country by large German forces; at the beginning of March these forces crossed the Danube into Bulgaria, and on April 6 attacked Yugoslavia and Greece. On March 12 Premier Antonescu held a nation-wide plebiscite. All persons over 21, except Jews, were obliged to vote, no speeches or propaganda were allowed, the vote was to be a vote of approval or disapproval of Antonescu's conduct. Needless to say that an unbelievably unanimous vote was cast. On March 5 Antonescu had seen Chancellor Hitler and had given Germany full control over Rumania's economic life and foreign policy. Meanwhile the Rumanians complained of the shortage of food in this rich agricultural country as a result of German operations, and the feeling of the people was reported to be so strongly anti-German that there were definite rumours of dissatisfaction on the part of the Germans with Antonescu's regime. But all efforts of finding other elements to lead the country failed. Antonescu himself reported on April 15 a plot by the Iron Guard to assassinate him during Easter services. Much of the Rumanian dissatisfaction could also be explained by the continued tension with Germany's other friend, Hungary, over Transylvania, whose loss had never been accepted by the Rumanians. How seriously Rumania had been hit by the "new order" could be seen in the fact that while the country had exported, in the first three months of 1940, 412,600 tons of cereals, the exports had sunk in the same period of 1941 to 96,900 tons. By the month of June a monster trial against the leading Iron Guardists brought heavy punishment to some of the former best known rightist statesmen of Rumania.

All internal problems, however, receded into the background for a while when Rumania on June 22 entered the war against the soviet union on the side of Germany to reconquer the provinces ceded to the soviet union in 1940. By the middle of July the formerly Rumanian parts of Bukovina and Bessarabia were reconquered. But the Rumanian army did not halt at the old frontiers. It had to bear the brunt of the war against the soviet union in southwestern Ukraine, across the Dniester river, and in the siege of Odessa; and the losses of the Rumanian army were so great that the discontent silenced for a short while by the military successes grew again and assumed alarming proportions. The war effort strained the disrupted Rumanian economy so much that war weariness became general and a demand for an end of military operations was heard even in high army circles. The persecution of the Jews in Rumania reached a new height. The territory lying between the Dniester and the Bug rivers, outside the former boundaries of Rumania, was put under Rumanian administration as Transnistria, with the capital in Tiraspol. Antonescu was named marshal on August 23, in recognition of the Rumanian army conquests.

In September the chief of staff of the Rumanian army, Gen. Michael Jonescu, was killed on the eastern front. The administrator for Bessarabia and Moldavia, George Alexianu, had to promise radical agrarian reforms to appease the angry peasantry of the newly conquered or reconquered territories. On Oct. 22 it was announced that Rumania had denounced the Vienna pact, according to which she had ceded part of Transylvania to Hungary. A new plebiscite in Rumania was held on Nov. 9 in which again every citizen had to vote on Rumania's foreign and home policies and had to declare before the vote whether he was going to vote yes or no—whereupon he was handed the corresponding ticket. The German news agency declared beforehand that no one in Rumania doubted that the plebiscite would be an overwhelming demonstration of confidence in Antonescu and his work. But in spite of tremendously rising prices, the value of Rumanian exports had fallen in the first half of 1941 to 15,000,000,000 lei as against 20,000,000,000 for the corresponding period of the preceding year, and the imports from 15,000,000,000 to 9,000,000,000. Thus Rumania, in spite of victories and conquests, offered by the end of 1941 a picture of seething discontent and disorganization. The picture was not brightened by Rumania's declaration of war against the U.S. in Dec. 1941. (*See* also WORLD WAR II.)(H. KO.)

Rumbold, Sir Horace George Montagu (1869–1941), British diplomat, was born Feb. 5, the eldest son of Sir Horace Rumbold, also a diplomat. He was educated at Eton and entered the diplomatic service as an honorary attaché at The Hague. After holding a series of posts in Europe, the near east and Asia, he became chargé d'affaires at Berlin in July 1914, but left Germany at the declaration of war a month later. He served as minister to Sweden in 1916–19; minister to Poland, 1919–20; British high commissioner and ambassador to Turkey, 1920–24; and ambassador to Germany from 1928 to 1933, when he retired. He was considered one of Britain's leading experts in Asiatic and near eastern affairs. Sir Horace was the author of *The War Crisis in Berlin, July-August 1914* (1940). He died at Tisbury, Wiltshire, Eng., May 24.

Rundstedt, Karl Rudolf Gerd von (1875–), German army officer, was born Dec. 12 at Aschersleben, descendant of a noble family of Brandenburg. At the start of war in 1914 he commanded a company in Alsace, then after a period of service with the general staff saw action on the eastern front in Galicia and northern Poland. It was in the latter regions that he acquired military fame in 1939 during the Polish campaign. He was in command

at the fall of Cracow, Lodz and Przemysl. The battles of the river San and the bend of the Vistula, and the entry into Warsaw were further milestones in Gen. Rundstedt's career. For these accomplishments and for his successes during the invasion of the Low Countries and France in 1940 he was created marshal of the reich July 19, 1940. Rundstedt was in command of the southern group of German armies in the Russian campaign of 1941, and it was against his forces that the Russians first began their counter-offensive, at Rostov late in November. The Germans' rout from that city was their first major defeat of World War II. Dispatches from Berne in December reported that Rundstedt had resigned his command, but these rumours lacked confirmation at the end of the year.

Rural Electrification. The electrification of rural areas in the United States which received its impetus in 1935 with the establishment of the Rural Electrification administration, continued during the year 1941, the estimated number of farms with central station service exceeding 2,250,000 as of Dec. 31 in comparison with approximately 2,000,000 at the end of 1940.

In terms of the percentage of farms with central-station electric service the increase was from 32.6% to an estimated 37.0% at the end of 1941.

The approximate number and percentage of electrified farms at the end of previous years were as follows: 1934, 744,000 farms, 10.9%; 1935, 789,000 farms, 11.6%; 1936, 1,043,000 farms, 15.4%; 1937, 1,242,000 farms, 18.2%; 1938, 1,407,000 farms, 20.5%; 1939, 1,786,000 farms, 27.8%. Prior to 1935 substantially all electrified farms received power from private utility companies; after 1935, rural electric service was furnished by both private companies and co-operatives, nonprofit enterprises. Over 90% of the federal rural electrification loans had been made to the latter type of enterprise, essentially community-owned and operated businesses.

In response to the continuing demand of rural populations for electric service, congress authorized $100,000,000 for rural electrification loans during fiscal 1942. This authorization increased to $474,000,000 the total funds available for rural electrification through the Rural Electrification administration. By Dec. 31, 1941, it was estimated that the Rural Electrification administration would have allotted a total of more than $400,000,000 to 850 systems to finance on a self-liquidating basis the construction of rural electric systems comprising about 380,000 mi. of line to serve more than 1,250,000 rural consumers. At the close of the year 1941 approximately 350,000 mi. of line were in operation serving some 875,000 consumers in contrast to 267,846 mi. serving 674,495 consumers at the end of 1940. About 80% of all consumers were farm families; the balance consisted of schools, churches, commercial establishments and many types of rural industries.

National Defense.—As a result of World War II and the national defense program of the United States, rural electrification was assuming, perhaps unexpectedly, an important new role in furnishing power for decentralized defense industries and military establishments. A study by a national defense commission revealed that in both England and Germany quantities of war matériel were being produced in small rural workshops and shipped to assembly points. In the United States rural electric systems were serving army camps, aeroplane beacons, communication systems and many small industrial plants whose facilities were becoming increasingly important to the national defense program.

Farms.—In addition to wider availability of electric power in rural areas in 1941, farm consumption of power in the United States continued to increase and there was some further reduction in rates. Wider application of electric power to farm operations received an increasing amount of attention from agricultural colleges and research agencies of the department of agriculture. An appliance survey made by REA-financed systems during the spring of 1940 showed the percentage of relatively new farm consumers of electricity who acquired various appliances and equipment, among which were: radios, 89.7%; irons, 85.3%; washing machines, 55.0%; refrigerators, 41.8%; vacuum cleaners, 21.0%; water pumps, 18.4%; separate motors, 16.5%; hot plates, 15.2%; poultry lights, 10.5% and cream separators, 8.2%.

In order to serve areas of low income and low density on an economical basis, a limited number of self-help projects were financed by the Rural Electrification administration during 1941. Under the self-help plan the farmer members of the co-operative performed the common labour required in constructing the system; such as digging pole holes, clearing right of way and trimming trees, for which they received credits.

These were applied against the cost of wiring their houses or the purchase of appliances and equipment. Group purchase plans for obtaining electrical appliances and equipment at quantity discounts were developed and used more extensively by farm members of rural electric co-operatives during 1941. (R. B. C.)

Russell, Lady Mary Annette (pseudonym ELIZABETH) (1866–1941), British novelist, was the author of the 1940 best seller, *Mr. Skeffington*. Her first book, an autobiographical novel, *Elizabeth and Her German Garden* (1898), was written in Pomerania, where she lived for 19 years. Following the death of her first husband, a Prussian nobleman, she returned to England. Her other works include *The Adventures of Elizabeth in Ruegen* (1929); *In the Mountains* (1929); *The Enchanted April* (1932); *The Jasmine Farm* (1934) and *All the Dogs of My Life* (1936). Lady Russell went to the United States in 1939 to make her home. She died in Beaufort, S.C., Feb. 9.

Russell Sage Foundation. This foundation was created by Mrs. Russell Sage in 1907 as a memorial to her husband. Its purpose is "the improvement of social and living conditions in the United States of America." Its general aim is the study of the causes of adverse social conditions and the dissemination of information which will be of assistance to citizens and organizations seeking to ameliorate, remedy or prevent such conditions.

Printed reports of such studies are made available at moderate prices. Among its publications are *Consumer Credit and Economic Stability*, by Rolf Nugent; *The American Miners' Association*, by Edward A. Wieck; and *Social Work Year Book 1941*.

The original gift by Mrs. Sage was $10,000,000, to which she added $5,000,000 in her will. The income of the foundation in 1941 was approximately $570,000.

The offices of the foundation are at 130 East 22nd street, New York city. (S. M. HA.)

Russia: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Russian Literature. The swing-over of soviet foreign policy in Aug. 1939 deprived soviet Russian literature for the time of one of its staple themes, anti-fascism, but the soviet-German rapprochement did not find any positive reflection in literature. Nor was soviet literature greatly affected by World War II. Perhaps its most notable product was Erenburg's journalistic novel *Padenie Parizha* (*The Fall of Paris*), a communist picture of France on the eve of collapse.

Nikolay Shpanov's *Pervy Udar* (*The First Blow*), published a few months before the outbreak of war between Great Britain and Germany, is worth mentioning. Although hardly a work of literary distinction, it gave a graphic description of the first 24 hr. in the "future" aerial war between the U.S.S.R. and Germany. At the end of 1939 four annual "Stalin prizes," of 100,000 roubles each, were instituted for the best work of the year in fiction, poetry, drama and literary criticism. The first prizes were awarded at the end of 1940, the prize for fiction going to Sholokhov for the last instalment of his *Tikhy Don* (*Quiet Don*). Other works of note published during 1939–41 include Fedin's short novel, *Sanatoriy Arktur* (*Sanatorium "Arcturus"*), which, in theme and treatment recalls somewhat Mann's *Zauberberg;* Kaverin's *Dva Kapitana* (*Two Captains*), Vsevolod Ivanov's *Parkhomenko.* An unusual and charming book was Prishvin's *Neodetaya Vesna* (*Unclothed Spring*), a record of a hunter's communion with nature. In drama the years 1939–41 yielded new plays by Leonov, Katayev, Vsevolod Ivanov, Afinogenov, Svetlov and Korniychuk (another Stalin prize-winner). Most of these plays deal with contemporary subjects; but there were also a number of plays on Russian historical themes. The 500th anniversary of the Kalmuck national epic *Dzhangar* was celebrated in 1940, and the centenary of Lermontov's death was commemorated in July 1941. In poetry the publication of a new book of verse by Anna Akhmatova, *Iva* (*The Willow Tree*), to which was added a selection from her earlier books, was something of an event. It was her first since 1921. In the field of translations there was a new version of *Hamlet* by Boris Pasternak. The war between the U.S.S.R. and Germany led to a fresh outburst of patriotism among soviet writers and an increasing interest in Russia's past, accompanied by the continued rehabilitation of a number of Russian national heroes.

Russian émigré literature suffered badly because of the war and in its centre, Paris, was almost brought to a standstill. Among the works published in 1939, Bunin's *Lika* (a sequel to his great work *Arsenyev's Life*) and Merezhkovsky's two volumes on Dante stood out. New poems by Vyacheslav Ivanov, one of the founders of Russian symbolism, attracted well deserved attention.

(G. St.)

Russian S.F.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Ruthenia. Also known as the Carpathian Ukraine, Ruthenia was formerly the easternmost part of the Czechoslovak republic. It was occupied in March 1939 by Hungary and incorporated into the latter state. It has an area of 4,690 sq.mi. with a population of 671,962. The people are in the great majority of Slavonic descent, closely related to the Ukrainians who live beyond the Carpathian mountains in eastern Galicia. The large majority of the population were engaged in agriculture and forestry in 1941; the most important product of the country is timber. The Ruthenian language enjoyed the status of a second official language in the province, which was represented by seven deputies in the Hungarian lower chamber. But the population was subject to a process of fast and progressive Magyarization, which grew in intensity after Hungary entered Germany's war against the soviet union as Germany's ally. For some time it had been thought that Ruthenia would become the nucleus for a national Ukrainian movement which, in the service of German expansion, would unite the Ukrainians in Poland, and especially those in the soviet union, into a German vassal state. After the conquest of the Polish and soviet Ukraine, however, the German government abandoned entirely the idea of any autonomy or national rights for the Ukrainians, who were put under direct German domination. Under these conditions the Ukrainian Ruthenia lost much of the political interest which had attached to it and was now openly subject to Magyarization. Some of the Ruthenian leaders continued to hope for participation in a Ukrainian national state, while others turned their attention to the possibility of a restoration of the democratic Czechoslovak republic of which they had been a part for 20 years, during which time the backward and neglected country had made great progress, both in its economic structure and in its educational level. (*See* also BOHEMIA AND MORAVIA; CZECHOSLOVAKIA; SLOVAKIA.)

(H. Ko.)

Rye. The rye crop in the U.S. in 1941 was 45,191,000 bu. from 3,498,000 ac. The 1940 crop was 41,149,000 bu. from 3,210,000 ac. and the ten-year (1930–39) average was 38,472,000 bu. from 3,320,000 ac. The U.S. record production of rye was 100,896,000 bu. in 1922.

U.S. Production of Rye by Leading States, 1941 and 1940

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
North Dakota	13,516,000	10,127,000	Kansas	979,000	672,000
South Dakota	7,510,000	6,060,000	Colorado	803,000	344,000
Nebraska	4,278,000	2,736,000	Pennsylvania	798,000	900,000
Minnesota	3,540,000	5,627,000	Michigan	783,000	1,160,000
Indiana	1,953,000	1,860,000	Illinois	728,000	856,000
Wisconsin	1,633,000	2,548,000	Oregon	638,000	608,000
Ohio	1,332,000	1,296,000	Montana	540,000	484,000
Oklahoma	1,224,000	969,000			

The acreage seeded to rye in the fall of 1940 was 6,182,000, and included areas seeded for pasture, soil improvement, etc., as well as the acreage seeded for harvest as grain. The acreage seeded in the fall of 1941 was 2% larger—6,289,000 ac. (*See* also CEREALS.)

(S. O. R.)

Sabatier, Paul (1854–1941), French chemist, was born Nov. 5 in Carcassonne, France. He began research as an assistant to Marcellin Berthelot, famous French chemist, was chemistry professor at the University of Toulouse after 1882 and was named dean of the university's science faculty in 1905. In 1912 he won the Nobel prize in chemistry and a year later he was named a member of the Institute of France and the Academy of Sciences.

He was also a member of the academies of Madrid, Amsterdam and Prague and was a fellow of the London Royal society. In 1926 Professor Sabatier received a special award from the American Chemical society, and in 1933 he received *in absentia* the Franklin medal, highest award of the Franklin Institute of Philadelphia, which cited his contributions to organic chemistry and his discovery of the catalytic activity of finely divided common metals.

Among his publications are *Travaux de Chimie, Leçons de Chimie Agricole, La Catalyse en Chimie Organique* and *Recherches sur les Sulfures et les Métaux Nitrés.* He died in Toulouse, France, Aug. 14.

Sabotage: *see* FEDERAL BUREAU OF INVESTIGATION.

Sackett, Frederic Moseley (1868–1941), U.S. ambassador and senator, was born Dec. 17 in Providence, R.I. After completing his studies at Harvard law school in 1893, Sackett took up practice in Columbus, Ohio. In 1898 he went to Louisville, where he was active in business and politics. In 1917 he was appointed federal food administrator for Kentucky. In 1924 he was elected senator from Kentucky, but resigned his seat in Dec. 1929 to accept the ambassadorship to Germany, a post he held until 1933. Sackett died in Baltimore, Md., May 18.

St. Christopher: *see* WEST INDIES, BRITISH.

St. Croix: *see* VIRGIN ISLANDS.

St. Helena and Ascension Island: *see* BRITISH WEST AFRICA.
St. John: *see* VIRGIN ISLANDS.
St. Kitts-Nevis: *see* WEST INDIES, BRITISH.

St. Louis. Eighth largest city of the United States, St. Louis, Mo., had a population of 816,048 by the federal census of 1940. An additional 541,567 persons live within the greater metropolitan district. Mayor (Jan. 1, 1942): William Dee Becker (Rep.).

By late 1941 from 40,000 to 60,000 had been added to the census figure of 1940, a consequence of the mushroom growth of war industries. Central location, minimum vulnerability to enemy attack and access to labour, fuel and raw materials have made St. Louis a focal point of such production. During the year the city was awarded $750,000,000 in defense contracts and an estimated $250,000,000 in subcontracts. New construction included a $106,000,000 small-arms ammunition plant, largest in the world in 1941.

In the winter of 1940–41, St. Louis won national attention through smoke elimination. In Sept. 1941 its citizens voted a charter amendment instituting civil service. Another amendment was voted requiring election of aldermen by residents of the respective wards they represent. Previously they were elected by the voters at large. By a count of 183,073 to 147,336 on April 2, 1941, Republican William Dee Becker, former St. Louis appellate judge, was elected mayor over his opponent, former Mayor Bernard F. Dickmann, Democrat, who had headed the city for two terms. Dickmann was elected in 1933 after 24 years of uninterrupted Republican rule.

When President Roosevelt late in 1941 transferred 12 federal agencies from overcrowded Washington, he moved to St. Louis the Rural Electrification administration and the Farm Security administration.

At the beginning of the 1941–42 fiscal year (April, 1941) the city deficit was $1,362,247 (a $320,482 decrease in a year); indebtedness, $72,245,500; assessed valuation of all property, $1,066,729,087; and the tax rate (including state and school), $2.74. (E. L. R.)

St. Lucia: *see* WEST INDIES, BRITISH.
St. Pierre and Miquelon: *see* FRENCH COLONIAL EMPIRE.
St. Thomas: *see* VIRGIN ISLANDS.
St. Vincent: *see* WEST INDIES, BRITISH.

Sakatani, Yoshiro, VISCOUNT (1863–1941). Japanese statesman and financier, was born January 16 in Okayama-ken. After graduating from Tokyo Imperial university in 1884, he entered the department of finance. Sakatani, who was finance minister from 1906 to 1908, had been a fiscal adviser to the emperor. He was mayor of Tokyo, 1912–15, director of a number of corporations and president of Senshu university.

A few days before his death in Tokyo, Nov. 14, he was made a viscount by Emperor Hirohito.

Sales, Retail and Wholesale: *see* BUSINESS REVIEW: *Retail and Wholesale Trade.*

Salt. The United States is the leading salt producer of the world, with 28% of a total estimated at some 35,000,000 metric tons annually, followed by the soviet union with 14%, Germany 11%, United Kingdom 10%, China 9%, France 7%, India 5%, and Italy 5%.

For 1940, data were available only from the United States, where the output increased 8% over 1939, to 10,003,448 short tons, while consumption increased 7% to 9,866,800 tons. Both imports and exports were small, the former 30,000 tons and the latter 147,000 tons in 1940. (G. A. Ro.)

Salvador, El. The smallest of the Central American republics, located on the Pacific coast. Area: 13,172 sq.mi.; pop. (Dec. 31, 1940, official est.): 1,787,930, of which 37.4% was rural. Capital: San Salvador (104,000). Religion: Roman Catholic; language: Spanish. President in 1941: Gen. Maximiliano Hernández Martínez.

History.—El Salvador was politically quiet during 1941, the eleventh year of Gen. Martínez's presidency. The dominant factors of the year's political history were direct outgrowths of World War II. The Martínez government continued its policy of maintaining cordial relations with the United States and of repressing totalitarian propaganda. In May strict instructions were issued to teachers "to explain democratic doctrines and their significance" and to exclude from teaching any discussion of anti-democratic doctrines.

Moral support for Great Britain was repeatedly expressed in the press. On Sept. 8 a presidential decree ordered the closing of the last Salvadorean consulates in Germany. Japan's attack upon the United States was answered within 48 hours by a formal and unanimous declaration of war on Japan (Dec. 8). Declarations against Germany and Italy followed on Dec. 12.

Meanwhile the government froze all axis funds, and on Dec. 16 formally tendered emergency fuel and other facilities for use by any Allied ships and planes.

Education.—There were about 1,300 primary schools in 1941 (enrolment 90,000), 44 secondary and normal schools and one university.

Finance.—The monetary unit is the colón (value: 40 cents U.S. in 1941).

Trade.—In 1940 exports totalled $12,227,955, a 4% decline, with coffee comprising 76.5% (1939: 83.6%), gold and silver 8.8% (2.8%), minerals 6.2% (2.3%), sugar 1.7% (1.8%), balsam 1.1% (0.8%). The United States took 75.2% of all exports (1939: 59.9%), Norway 8.4% (7.2%), Honduras 4.2% (4.1%), Sweden 3.1% (4.3%). Imports (foodstuffs, textiles, machinery and miscellaneous manufactures) were valued at $8,108,044 (8.4%), supplied mainly by the United States 67.4% (53.0%), Great Britain 7.6% (6.9%), Italy 4.0% (4.3%), Honduras 3.4% (2.8%), France 2.6% (3.6%), Canada 2.3% (0.8%), Peru 2.2% (2.0%), Yugoslavia 1.3% (0.3%), Germany 1.3% (17.5%). Exports to Latin-American countries aggregated 6.9% (1939: 8.4%), imports from them 8.5% (6.7%).

Communication.—External communication is principally by sea and Pan American Airways, supplemented by the Inter-American highway and by railways. Railways totalled 602 km. in 1941. The national highway system (nearly 4,000 km.), already the best in Central America, was being rapidly expanded. The Inter-American highway, 183 mi. through El Salvador (cost to 1941: $4,000,000), was roughly two-thirds complete in 1941.

Agriculture.—Coffee is the dominant money crop (1940 export: 942,490 bags). The United States, Norway, Sweden and Italy are normally the heaviest consumers. Sugar is mainly for domestic consumption, cotton (1939–40: 9,000 bales) entirely so. (L. W. BE.)

Salvation Army. In the United States, war service of the Salvation Army was organized into four principal channels:

1. Operation of clubhouses for service men, as designated through the United Service organizations (*q.v.*).
2. Collection and salvage of waste paper, scrap metals, clothing and other discarded materials of value for defense.
3. Evacuation and emergency housing of civilians.
4. Operation of mobile canteens at defense installations.

In the United Service organizations' program the Salvation Army participated with five other national welfare agencies in the raising of a fund of $14,625,000 for the first year's operation of a chain of service clubs at camp and base communities, and for other leisure-time and recreational work among soldiers and sailors. By Dec. 31, 45 of these clubs, located from Maine to Hawaii, had been assigned to the Salvation Army for operation. A staff of more than 200 Salvationists and others was detailed for their direction and supervision. The first to come under enemy

THE SALVATION ARMY demonstrated its role in providing for the U.S. armed forces at a United Service Organizations rally May 20, 1941 in New York city

fire was the U.S.O. club operated by Major and Mrs. Alva M. Holbrook at Schofield barracks, Honolulu, raided from the air by the Japanese Dec. 7.

A national military and naval department with four regional supervisors stationed in New York city, Atlanta, Chicago and San Francisco was created for the co-ordination and execution of the war-welfare program. Administration of the Salvation Army's regular program is conducted from the same cities, where officers' training colleges are situated and the *War Cry*, the official gazette, is issued, under the four territorial commanders: (Eastern) Commissioner Ernest I. Pugmire, 120 West 14th st., New York city; (Central) Lt.-Commissioner John J. Allan, 713 North State st., Chicago; (Southern) Commissioner William C. Arnold, 54 Ellis st., Atlanta; and (Western) Lt.-Commissioner Donald McMillan, 115 Valencia st., San Francisco. Commissioner Edward J. Parker, national commander, with headquarters at 120 West 14th st., New York city, co-ordinates the administration of national policies.

The war—with its attendant family separations, transfer of technicians, and large-scale movements of peoples for safety and defense purposes—brought hundreds of unusual inquiries to the organization's missing persons bureau, which successfully traced 722 individuals with whom relatives or friends had lost contact.

In other lands, the war procedures established in 1939 at the instruction of General George L. Carpenter, international commander at London, were continued and expanded. In North Africa motorized canteens accompanied the British forces across the deserts in their westward offensive; at Icelandic and other North Atlantic bases the Canadian War Service supplied comfort to the continent's defenders; in China, Malaya, the Dutch East Indies and the Philippines women and children in military target areas were evacuated to Salvationist institutions for care.

Meanwhile, some 27,500 men and women officers—stationed at 17,900 corps and outposts and at 1,700 hospitals, homes, shelters and other Salvationist institutions in almost 100 countries, territories and colonies—proceeded with their established evangelistic, health and welfare schedule unless obliged to halt because of actual combatant conditions. (E. J. PA.)

Samara: *see* KUIBYSHEV.

Samoa, American. A possession of the United States of America. It lies about 2,700 mi. east of the northern tip of Australia and 2,200 mi. south of the Hawaiian islands; comprises the island of Tutuila and all other islands of the Samoan group E. of longitude 171° W., including Rose island, Tau, Olosega, Ofu, Aunuu and Swains. The principal island is Tutuila, area about 40 sq.mi. Pago Pago, the capital, population 934, has the safest and best harbour in the South Seas. Total population by census of April 1, 1940, 12,908, including 11,919 natives of Samoa (Polynesians); the remainder are foreign born and personnel of the U.S. naval establishment.

Public schools had an average enrolment of 3,000 during 1940–1941. Health and sanitary conditions were excellent. All medical attention is given by naval medical officers who treat the natives free of charge.

The only bank is the Bank of American Samoa, conducting a commercial banking business as a division of the treasury of the naval government of American Samoa, which owns the capital stock. Copra is the chief export; 862 tons, returning $23,557, were exported during the copra crop year ending Jan. 31, 1941; 325 tons of mats, rugs and native curios, returning $69,582, were exported during the fiscal year ending June 30, 1941. Imports: from U.S. $112,998; from New Zealand-Australia $131,984; other $18,721. The island has no indebtedness and receives no financial aid from the U.S. government. (G. L. WF.)

American Samoa was not subjected to attack in 1941 after the outbreak of war in the Pacific Dec. 7.

Samoa, Western: *see* MANDATES; PACIFIC ISLANDS, MANDATED.

Sanborn, John Pitts (1879–1941), U.S. newspaperman and music critic for the *New York World-Telegram*, was born in Port Huron, Mich. After graduating from Harvard, Sanborn was music editor for the *New York Globe*, 1905–23. During the summer months from 1912 to 1923 he served as correspondent in Europe for New York newspapers, and in 1924 he joined the *New York Evening Mail* staff, writing musical reviews. He remained at this post when the paper merged with the *Telegram* and later with the *Evening World*. For his achievements in musical criticism he was decorated by the governments of Italy and France. His years in France inspired him to write a volume of poetry, *Vie de Bordeaux* (1917).

He also wrote *Prima Donna*, a novel of the opera (1929); *Greek Night*, a novel (1933); and the *Metropolitan Book of the Opera* (1937). He also served as music commentator on the radio. He died in New York city, March 7.

Sand and Gravel. The United States production of sand in 1940 was 78,674,000 short tons, and of gravel 159,634,000 tons, a total of 238,308,000 tons, as compared with 72,542,000 tons of sand, 153,466,000 tons of gravel

and a total of 226,008,000 tons in 1939. In 1940 building construction took 44% of the sand output and road paving took 39%; among the less important uses, foundries used 6% as moulding sand, and glass manufacture took 3%; of the gravel output, 21% was used in building construction, 70% in road paving and 7% in railroad ballast. (G. A. Ro.)

Sand Island: *see* MIDWAY ISLANDS.
Sandstone: *see* STONE.

San Francisco. Twelfth largest city of the United States, San Francisco, Calif., had a population of 634,536 by the federal census of 1940. On July 1, 1941, officials of California estimated the city's population at 675,000. Mayor (Jan. 1, 1942): Angelo J. Rossi.

Residential building permits issued during the decade 1931–41 totalled nearly $100,000,000, with 1941 permits accounting for about one-fourth of the 10-year total.

Defense industries dominated San Francisco bay area activities during 1941 and contributed greatly to pay rolls and employment. Defense contract awards to bay area establishments at the close of 1941 amounted to more than $1,400,000,000, compared with about $750,000,000 at the beginning of the year. Of the former amount, shipbuilding awards totalled $911,000,000; construction awards, $380,000,000; supplies and equipment, $109,000,000. Shipbuilding employed about 55,000 workers at the end of the year. There were 181 public schools in San Francisco in 1941, also many private, parochial, nonsectarian and technical schools. The University of San Francisco and San Francisco State Teachers college are located in the city, and near by are the University of California at Berkeley, the California School of Fine Arts and Stanford university.

After the outbreak of war between Japan and the United States in Dec. 1941, rigid blackouts were enforced upon the city. Air-raid alarms were sounded on several occasions, but no actual aerial attacks had occurred by the end of the year.

Santo Domingo: *see* DOMINICAN REPUBLIC.
São Tomé: *see* PORTUGUESE COLONIAL EMPIRE.
Sarawak: *see* BORNEO.

Saskatchewan. The middle of the three prairie provinces of Canada, Saskatchewan was created a province by the dominion parliament Sept. 1, 1905. Area, 251,700 sq.mi.; pop. 887,747 (dominion bureau of statistics, 1941). Seat of government, Regina (56,520). The province as of 1941 sent 21 members to the house of commons, Ottawa, Ont., and 6 senators to the senate. The principal cities with populations (1941 census) are: Saskatoon (42,269), Moose Jaw (20,496), Prince Albert (12,290), Weyburn (6,119).

The Liberal party, elected June 8, 1938, continued in power in 1941 under the premiership of William Patterson. There were no political or other happenings of special significance during the year.

Education.—The province has autonomous control over formal education. In 1939 the daily average school attendance was 163,356; teachers numbered 7,415; government grants and tax revenue amounted to $9,559,875.

Communication.—In 1940 there were 4,315 mi. of surfaced roads and 147,503 mi. of improved earth roads. Total expenditures on roads for 1939 were $3,401,679.

Finance.—Saskatchewan through 1941 had never defaulted on its bond maturities. Ordinary revenue in 1940 was $24,958,420; ordinary expenditure was $25,258,324.

Agriculture.—The following figures, as reported by the dominion bureau of statistics, show the value of the field crops for 1941: wheat, $69,360,000; oats, $27,200,000; barley, $10,640,000; rye, $2,583,000; flaxseed, $4,464,000; potatoes, $2,197,000; hay, clover, $3,396,000; alfalfa, $672,000; fodder corn, $223,000.

The total value of crops in 1941 was $120,781,000. In 1940 it was $178,887,000. (J. T. C.)

Saudi Arabia: *see* ARABIA.

Savings Banks, Mutual. The year 1941 was eventful in the history of mutual savings banks in the United States, for two banks, those first established in the country, the Provident Institution for Savings, Boston, Mass., and the Philadelphia Savings Fund society, Philadelphia, Pa., completed 125 years of service. From two banks in 1816 the system had expanded to 538 savings banks as of July 1, 1941, with total assets of $11,938,000,000, an increase during the year of $23,400,000 as compared with an increase of $173,600,000 for the year ending July 1, 1940. Deposits credited to 15,906,157 accounts totalled $10,606,000,000 on July 1, 1941, the highest amount on record. The combined surplus was $1,284,000,000, or 12·11% of deposits. Dividends averaged 1·9% in 1941, a decline from 2·04% in 1940 and 2·17% in 1939. Two savings banks were absorbed by merger during the year, reducing the total number of banks to 538.

Defense Bonds.—The major development in the savings banks during 1941 was the qualification of these banks as agents for the sale of U.S. defense bonds. Early in the year the rising cost of the defense program made it imperative for the U.S. treasury to raise huge sums of money. The amount of funds to be raised exceeded the possible return from increased taxes, and the treasury department decided to increase the sale of government bonds to the individual investor, thus avoiding the sale of too many bonds to commercial banks. Three new series of U.S. bonds, called defense bonds, went on sale May 1. The bonds designed for the small investor are called U.S. defense bonds series E and are almost identical with the "baby bonds" that have been on sale since early 1935. They are discount bonds issued at 75% of face value and grow in redemption value every six months after the first year to full face value at the end of ten years. If held to maturity they yield the purchaser the equivalent of 2.9% interest compounded semiannually. The bonds are issued in denominations of $25, $50, $100, $500 and $1,000, and purchases are limited to $5,000 face value a year to any one person.

They are nonnegotiable and redeemable at the option of the holder not less than 60 days from the date of issue.

Series F and G bonds are designed for corporations, other than commercial banks, trustees, pension funds and large individual investors. Series F bonds are discount bonds issued at 74% of face value and mature in 12 years with a yield equivalent to 2.53%, compounded semiannually. Series G bonds are income bonds, issued at par, with a maturity of 12 years, bearing interest on par value at 2½%, paid semiannually by treasury cheque. Both series F and G bonds are nonnegotiable and redeemable, only after one month's notice in writing, on the first day of any month not less than six months from date of issue, at fixed redemption values specified on their face. To discourage cashing in of series G bonds before maturity the redemption values are fixed below par on a scale that provides the purchaser with approximately the same yield as he would receive from a series F bond held for the same period of time. Series F and G bonds may be purchased to a total of $50,000 cost price in any one year.

Savings banks may qualify as issuing agents for series E bonds and may take orders for series F and G bonds. They may also sell defense savings stamps, which are available in denominations of $.10, $.25, $.50, $1.00 and $5.00. When enough stamps have been accumulated they may be turned in for a defense savings bond. Of the 538 mutual savings banks, 506 had qualified as issuing banks on Nov. 1, 1941.

In the seven months period to Dec. 1, 1941, mutual savings banks distributed $119,056,650 par value of defense bonds and stamps.

Life Insurance.—During the year, a third state, Connecticut, legalized the sale of savings bank life insurance. The Connecticut plan follows the New York law more closely than it does the Massachusetts law. It allows policies up to $1,000 and the number of policies to three for one individual or maximum insurance of $3,000. There is a Savings Bank Life Insurance fund to which the issuing banks subscribe. This fund is controlled by a board of seven trustees, appointed by the governor, and these trustees provide the general machinery under which the policies are issued. A special committee, including the governor and the commissioners of banking and insurance, is responsible for putting the law into operation.

On Oct. 31, 1941, the end of the third fiscal year of operation of insurance departments in the savings banks of New York state, there were 22 issuing banks and 17 agency banks, an increase of 14 issuing and seven agency banks during the year. This substantial growth in the number of banks selling savings bank life insurance may be attributed to the changes made in the New York law in 1940.* On Oct. 31, 1941, there were $17,800,000 of insurance in force, representing 21,900 policies, an increase of $6,700,000 in insurance in force and of 8,200 policies since Oct. 31, 1940. In the state of Massachusetts there were 29 issuing banks and 108 agency banks on Oct. 31, 1941, an increase of two agency banks during the year. In that state there were $209,600,000 of insurance in force, representing 232,200 policies, an increase of $17,600,000 in insurance in force and of 20,200 policies since Oct. 31, 1940.

*After one year of operation, several changes were made in the statute governing savings bank life insurance, to conform with the views of savings banks. The changes were made to encourage more banks to enter the business. They were designed to place more responsibility on savings-insurance banks for the administration of the system than the original laws permitted, without diminishing the supervisory functions of the state insurance and state banking departments, to which all the administration duties were at first also assigned. The amendment provided that contributions to the insurance guaranty funds could be made from the savings banks; whereas originally these funds were required to be subscribed by individuals.

Great Britain and Europe.—No reports on the activities of the savings banks on the European continent during 1941 were available. The reports from Great Britain, however, were that the trustee savings banks had been a great help in raising funds for war purposes since all deposits in "ordinary accounts" were turned over to the National Debt commissioners for investment in government securities and deposits in "special investment accounts" had been invested entirely in government bonds since the outbreak of the war.

Balances in trustee savings banks were £360,489,000 on Aug. 31, 1941, an increase of £52,542,000 for the year ending that date as compared with a gain of £22,467,000 for 1940. This unusual gain was believed to be due to the work of the savings groups, to War Weapons Weeks and to the deposit of hoarded money. At the end of August there were 225,000 savings groups in England, Wales and Scotland, with a total membership exceeding 13,000,000 savers. These groups collect regular weekly savings from their members and deposit a substantial part of these funds in the trustee savings banks. The balance is deposited in the Post Office Savings bank or used to purchase national savings certificates and defense bonds.

A War Weapons Week is a special campaign managed by an individual city or village to raise a definite sum of money for a specific purpose. The first War Weapons Week was held in the Yorkshire city of Leeds in June 1940. The citizens of Leeds decided that they would like to provide Great Britain with 100 bombing planes, at a cost of about £2,000,000. They could not afford to give the money, but by lending it at low rates in interest, they could help equally as well. A seven-day campaign was staged. Posters, processions, speeches and loud-speakers urged citizens to roll up to the banks, post offices and other centres and invest in war bonds and certificates. At the end of this first War Weapons Week a total of more than £3,500,000 had been brought in. Since then, every town of any consequence has held its own Week with equally satisfying results.

(HE. BR.)

Schizophrenia: *see* PSYCHIATRY.

Schobert, Eugen Ritter von

(1883?–1941), German general, commander of a German army on the Russian front at the time of his death, was born in Wuerzburg, Germany. Steeped in the military tradition of his family, long noted for its officers, he entered the First Bavarian infantry regiment at 19. He won the iron cross and other decorations for his services in World War I. He served in the war ministry and as inspector of infantry in 1933. In 1936 he commanded one of the divisions which occupied the Rhineland and in July 1940, in recognition of his manoeuvre which led to the penetration of French lines north of Verdun, he was made a colonel general by Hitler.

In Aug. 1941 he was put in command of the German-Rumanian army thrusting northeast to join the German forces coming down from Galicia. A German high command communiqué disclosed that he was killed in action, Sept. 12.

Schroeder, Ludwig von

(1884–1941), German general, was born Sept. 12. He organized Germany's civil air-raid protection league, of which he was president, and enrolled an estimated 13,000,000 reich nationals into this nation-wide air defense corps. Hitler, on the occasion of his 50th birthday in 1939, promoted von Schroeder to the rank of general of anti-aircraft. After the fall of Yugoslavia, he was made military commander of Serbia. He died at Hohenlychen, Brandenburg, July 29, from injuries he received in an aeroplane crash in Belgrade earlier in the month.

Schulte, Karl Josef

(1871–1941), German cardinal, archbishop of Cologne, was born Sept. 14 in Westphalia, the son of a farmer. In 1931 the cardinal protested against nazi "misconceptions of Christian teachings." Two years later, however, he tried to come to terms with the Hitler regime. Then acting for the Fulda conference of German bishops, he formally revoked the church ban on the nazi movement, explaining that the reasons for the ban were no longer existent. This apparent understanding was short lived. Clerical protests against nazi persecution of churchmen mounted, and in both 1935 and 1938 Cardinal Schulte signed pastoral letters issued by the German bishops containing charges that the nazis violated church rights and listing grievances against the regime. He died in Cologne, March 11.

Schuman, William Howard

(1910–), U.S. composer and music teacher, was born in New York city. A pupil of Persin, Haubiel and Roy Harris, he also studied at the Salzburg Mozarteum. His compositions prior to 1941 included *Choreographic Poem* (1934), *Symphony No. 1* (1935), *String Quartet No. 1* (1936), *Prelude and Fugue, Symphony No. 2, Pioneers and String Quartet No. 2* (1937). His *Quartet No. 3* was given its first public performance by the Coolidge string quartet in Town hall, New York city, Feb. 1940. A cantata, *This Is Our Time*, which was given its premiere in New York city, July 1940, is unusual in that it is a choral work written for nonreaders of music; originally composed for the People's Philharmonic Choral society, a workers' amateur group.

His *Symphony No. 3*, played for the first time by the Boston Symphony orchestra at Boston, Mass., in Oct. 1941, received wide critical acclaim.

Science and World Order, British Association Conference on.

The most important event in the history of that division of the British association devoted to the study of the social implications of advances in science was the conference on Science and World Order held at the Royal Institution, London, on Sept. 26, 27 and 28, 1941. The conference was truly international in character, for distinguished speakers representing science in Britain, the empire, the United States of America, the U.S.S.R. and other countries, indicated the lines on which science could assist in planning a world order and in serving national needs. The six sessions of the conference were devoted to discussions on science in government, science and human needs, science and world planning, science and technological advance, science and postwar relief and science and the world mind. Sir Richard Gregory, president of the British association, delivered the inaugural address and presided at the first session. The chairmen of the remaining sessions, in the order just named, were the American ambassador, J. G. Winant, the Soviet ambassador, M. Maisky, the president of Czechoslovakia, Dr. Beneš, the Chinese ambassador, Dr. Wellington Koo and H. G. Wells.

At the end of the sixth session, Sir Richard Gregory announced that committees would be appointed to prepare reports dealing with important points which had been raised during the sessions and presented a charter of scientific fellowship which had been drawn up by a committee of the division.

It is difficult to summarize in brief compass the results of a three-day discussion which ranged over so many fields of thought and action; perhaps the most hopeful method is to group those proposals which call for international action and planning and those which call for similar efforts within national boundaries; and it must be emphasized that in every instance objective scientific study was demanded, the results of which were presented to governments for appropriate political action.

Thus in the international sphere it was clearly brought out that there existed an urgent need for more accurate and detailed knowledge of the extent of the material resources of the world, particularly of the sources of energy and of food. The joint use of heat and power calls for regional planning on a large scale; the use of raw materials for the common benefit of mankind is indispensable to any successful scheme of world order and to the development of backward areas; international planning in agriculture is necessary to avoid the extremes of waste in one area and want in another. A problem raised by the war was that due to Russia's scorched-earth policy and it was proposed that research stations in Canada should multiply grain bred for its suitability to the conditions prevailing in those agricultural regions in Russia which were devastated and that a similar policy should be followed in respect of fruit trees. International co-operation was demanded in the fields of epidemiology and in the systematic use of the natural curative resources of Europe. It was concluded that international organizations are a prerequisite for any successful postwar food policy and for implementing efficiently measures against malnutrition.

Among topics of national interest, the relations between science and government were discussed at considerable length; existing contacts in Great Britain were described and directions were indicated in which these contacts might be extended. The work of the Tennessee Valley authority was described and discussed and examples were reviewed from British colonial history of successful co-operation between science and government. Town and country planning, diet, education, housing, public health, public heat supply, the easing of housework—these are examples of topics concerning which constructive criticisms and outline plans were made in many of the sessions.

The seven points of the charter of scientific fellowship are being given *in extenso*. They followed a preamble which asserted that World War II

involved an age-old conflict of ideas and that complete freedom of thought and interchange of knowledge and opinion were supreme necessities. These seven points were termed a Declaration of Scientific Principles:

(1) Liberty to learn, opportunity to teach and power to understand are necessary for the extension of knowledge, and we, as men of science, maintain that they cannot be sacrificed without degradation to human life.

(2) Communities depend for their existence, their survival and advancement, on knowledge of themselves and of the properties of things in the world around them.

(3) All nations and all classes of society have contributed to the knowledge and utilization of natural resources, and to the understanding of the influence they exercise on human development.

(4) The service of science requires independence combined with cooperation, and its structure is influenced by the progressive needs of humanity.

(5) Men of science are among the trustees of each generation's inheritance of natural knowledge. They are bound, therefore, to foster and increase that heritage by faithful guardianship and service to high ideals.

(6) All groups of scientific workers are united in the fellowship of the commonwealth of science, which has the world for its province and the discovery of truth as its highest aim.

(7) The pursuit of scientific inquiry demands complete intellectual freedom and unrestricted international exchange of knowledge; and it can only flourish through the unfettered development of civilized life. (A. FN.)

Scientific Research and Development, Office of.

The Office of Scientific Research and Development (OSRD) was created in the Office for Emergency Management (*q.v.*) by executive order 8807 of June 28, 1941. Dr. Vannevar Bush (*q.v.*) of the Carnegie institution of Washington was appointed director. The functions of the office were:

(a) Advise the president with regard to the status of scientific and medical research relating to national defense and the measures necessary to assure continued and increasing progress in this field.

(b) Serve as the centre for the mobilization of U.S. scientific personnel and resources in order to assure maximum utilization of such personnel and resources in developing and applying the results of scientific research to defense purposes.

(c) Co-ordinate, aid and, where desirable, supplement the experimental and other scientific and medical research activities relating to national defense carried on by the departments of war and navy and other departments and agencies of the federal government.

(d) Develop broad and co-ordinated plans for the conduct of scientific research in the defense program, in collaboration with representatives of the war and navy departments; review existing scientific research programs formulated by the departments of war and navy and other agencies of the government, and advise them with respect to the relationship of their proposed activities to the total research program.

(e) Initiate and support scientific research on the mechanisms and devices of warfare with the objective of creating, developing and improving instrumentalities, methods and materials required for national defense.

(f) Initiate and support scientific research on medical problems affecting national defense.

(g) Initiate and support such scientific and medical research as may be requested by the government of any country whose defense the president deems vital to the defense of the United States under the terms of the act of March 11, 1941, entitled "An Act to Promote the Defense of the United States"; and serve as the central liaison office for the conduct of such scientific and medical research for such countries.

(h) Perform such other duties relating to scientifit and medical research and development as the president may from time to time assign or delegate to it.

Within the OSRD are the National Defense Research committee (NDRC) and the Committee on Medical Research (CMR). The former assists the director of the OSRD in the mobilization of the scientific personnel and resources of the U.S., while the latter advises and assists with special reference to the medical personnel and resources of the U.S. The NDRC operated as a committee of the Council of National Defense from June 27, 1940 until June 28, 1941, during which time it entered into a number of contracts which were assumed by the OSRD.

The OSRD operates through contracts with scientific laboratories in academic and industrial establishments. As of Dec. 31, 1941, the OSRD had concluded 424 contracts, while work was actively under way under approximately 264 additional letters of intention for which covering contracts were in the process of negotiation. These contracts and authorizations were with a total of 73 academic and 55 industrial establishments. Most of the work of the OSRD was started at the direct request of the armed services. Practically all of it is of a confidential nature which makes it impossible to reveal details. However, results of the OSRD efforts had already been shown at the end of 1941 in orders placed by the armed services for equipment. Between June 27, 1940 and Dec. 31, 1941 the OSRD and its predecessor NDRC had received a total of $25,702,536 to be used in carrying out its objectives. (I. ST.)

Scotland: *see* GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Sculpture.

Stimulating sculpture exhibitions were held by representative groups, new acquisitions were made by leading museums and several important public projects, as well as various lesser ones, were brought to completion during 1941. The democratization of art, assiduously cultivated for a number of years through government art channels, including competitions and exhibitions, was continued throughout the United States with further evidence of popular interest and appreciation.

Serious problems, however, were presented to sculptors, who in the years preceding had seen the promise of rich opportunities for the development of sculpture. Far-reaching readjustments became necessary. While many were put back on their own resources as a result of the tapering off of the federal art projects, numerous young sculptors were called to national service in the armed forces and in defense preparation. While these conditions necessarily affected the volume of sculpture production and other activity, much work of vitality was produced. In the contemporary field both conservatives and moderns held their ground, the latter showing as before much vigorous experimentation with methods and materials.

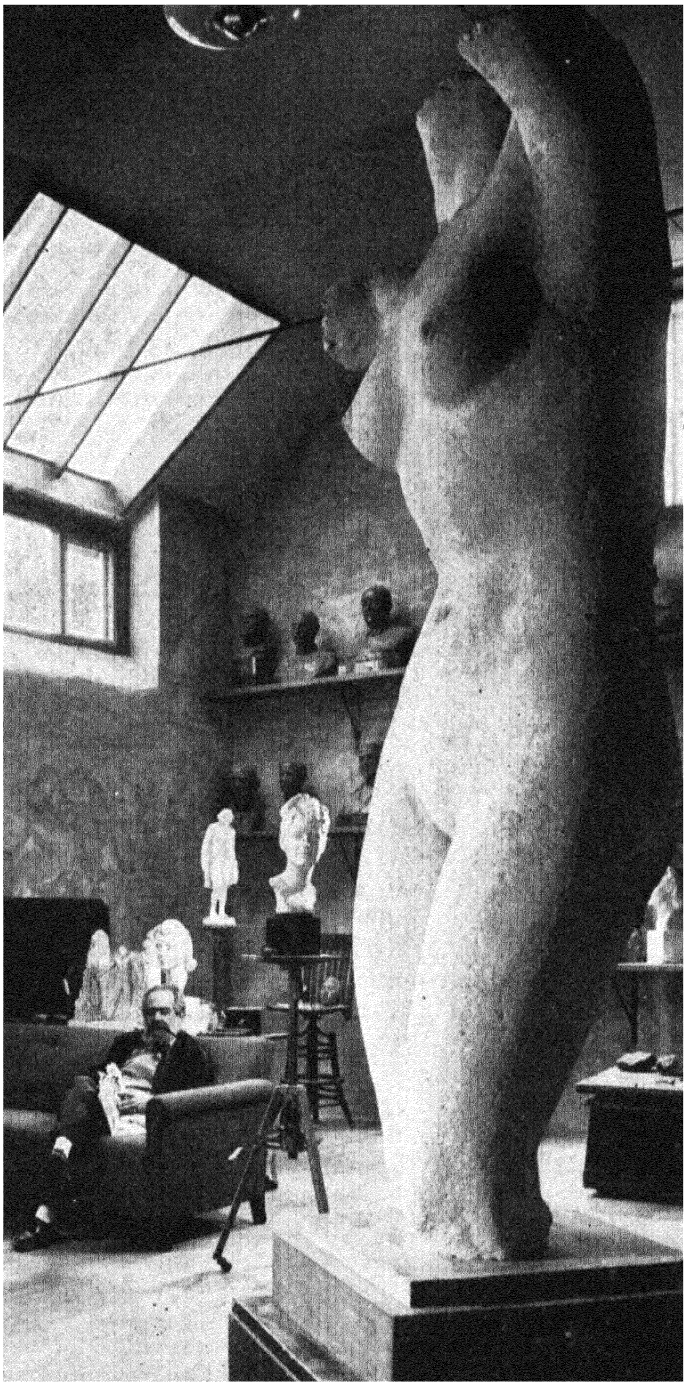
National Gallery of Art.—The major event of 1941 fell in the field of historical sculpture with the installation at the National Gallery of Art in Washington, D.C., of the famous Renaissance sculptures from the Mellon and Kress collections. This group of some 70 pieces, showing the efflorescence of the Florentine school led by Donatello, became at once one of the most important collections in the United States, impressively illustrating the work of Verrocchio, Mino da Fiesole, Rossellino, Pollaiuolo, the Della Robbias and other Italian and French artists of the period. Recognition of the rich opportunities for study and appreciation of these splendid old world treasures was one of the high lights of the opening of the National gallery in March.

Shows.—In the contemporary field recognized groups were active, including the youthful Sculptors' Guild which again served to bring together representative work by younger sculptors. Showing air raids, refugees and traditional American figures with folk art implications, the artists who exhibited in a landscaped open lot in New York city, gave perhaps the best illustration of the vigorous realistic and experimental trends being followed at the present time. The work represented in particular a new-developing cross-section of New York and nearby talents, many of them products of the federal art projects. The conservative National Sculpture society limited itself in 1941, on the other hand, to two small shows, one of which was devoted to work in relief, with special emphasis on medallic sculpture.

Government Sponsored Work.—Most conspicuous vitality was shown perhaps in the public works completed under national and civic sponsorship, including decorative sculpture for post offices and courthouses. Striking examples were the eight granite reliefs for the façades of the Philadelphia courthouse, completed under the auspices of the Section of Fine Arts of the Public Buildings administration. Edmond Amateis did the four large reliefs on the subject of "Mail Delivery," and Donald De Lue the four on "Law and Justice" which were set in place in August, both groups showing maturity of accomplishment and decorative force in style. Although a number of other similar works were produced as the result of competitions among sculptors, the Philadelphia groups constituted the latest major project completed. The section, however, continued its awards, giving first prize in a competition conducted in 13 states to two figures executed by Sahl Swarz, a New York sculptor, on subjects of Freedom. The figures were to be completed in bronze for the Statesville, N.C., courthouse and post office.

Memorials.—Work on sculptured memorials also occupied the public's interest in 1941. The year saw the essential completion of the huge Mt. Rushmore memorial by the late Gutzon Borglum, which was pronounced ready for dedication. Showing the gigantic heads of Washington, Jefferson, Lincoln and Theodore Roosevelt on the crest of a granite peak in the Black Hills of South Dakota, the monument required 14 years to complete and is one of the most ambitious projects realized by a modern sculptor. New York university, whose sculptural hall of fame contains the busts of famous Americans, made an addition to the group by authorizing a bust of Stephen Collins Foster, the American composer of folk music. The work was assigned to Walker Hancock and was unveiled in May. Another monument to a historic figure was a statue of Peter Stuyvesant, the Dutch governor of New Amsterdam, which was unveiled in Stuyvesant park, New York, on ground originally part of Stuyvesant's farm. The seven-foot bronze by Gertrude V. Whitney was presented to the city by the Netherlands America foundation.

Perhaps the most important sculptural assignment during the year was the award to Rudulph Evans of the $35,000 contract for a statue of



JO DAVIDSON in his Lahaska, Pa., studio, completed in 1941. The nude in the foreground is called "Torso"

Thomas Jefferson for the Jefferson memorial in Washington, D.C. Evans' four-foot model of the third president won a national competition sponsored by the Jefferson Memorial commission in which 100 sculptors took part. The statue when completed will be a bronze of heroic proportions standing 18 feet high on a seven-foot pedestal in the main hall of the memorial.

Museums.—As usual museums made prominent additions to their sculpture collections through purchases and gifts. A 15th century north German bronze font bearing the signature of Goteke Klinghe and the date 1483, acquired by the Museum of Fine Arts, Boston, Mass., and a bronze bust of Dolores Ibarruri, called "La Pasionaria," one of the leaders of the loyalist forces in the Spanish civil war, by Jo Davidson, which was obtained by the Museum of Modern Art, New York city, were among the most prominent. Seven pieces by contemporary sculptors, including Malvina Hoffman, William Zorach, A. A. Weinman and Gaetano Cecere, also went to augment the growing collections of the new Norton Gallery and School of Art in West Palm Beach, Fla.

Europe.—Sculptural achievement in Europe was again greatly limited by the war, and the production of few works of prominence was recorded during 1941. Great Britain continued its efforts to preserve normal productivity, and was among the most successful in promoting the careers of sculptors. Many of France's well known artists scattered before and after the fall of France and sculptural activity had been virtually at a standstill there since the German invasion. (*See* also ART EXHIBITIONS.) (C. BU.)

Sea Blockade: *see* BLOCKADE.

SEC: *see* SECURITIES AND EXCHANGE COMMISSION.

Secondary Education: *see* EDUCATION.

Secondary Metals.

Practically no data on the recovery of secondary metals are collected outside the United States. In the United States the recovery is mainly from two different classes of material: first, new scrap, that is scrap made in the fabrication of new metal, plus any new products that have been discarded because of faulty construction or material; and second, old scrap, which is made up of worn-out products discarded from the pool of metal in use and collected as "junk."

Secondary Nonferrous Metals Recovered in the United States

	1937	1938	1939	1940
Copper—Thousands of short tons				
As metal	285.6	192.4	151.4	170.8
In alloys	246.5	167.4	345.1	351.8
In chemical compounds	?	?	3.2	9.4
Total	532.1	359.8	499.7	532.0
Percentage*	62–78	60–74	62–57	50–53
Lead—Thousands of short tons				
As metal	154.5	119.4	86.9	59.6
In alloys	120.6	105.5	148.8	200.8
In chemical compounds	?	?	5.8	
Total	275.1	224.9	241.5	260.3
Percentage*	41	41	36–87	33–87
Zinc—Thousands of short tons				
As metal	64.5	42.3	36.0	35.5
In alloys	62.8	44.8	98.9	112.3
In chemical compounds	?	?	54.8	58.1
Total	127.3	87.1	189.6	205.9
Percentage*	21	21	33–24	29–31
Tin—Thousands of short tons				
As metal	8.3	4.9	4.4	5.1
In alloys	20.3	17.3	23.0	26.5
In chemical compounds	1.7	1.4	0.7	0.7
Total	30.3	23.6	29.2	32.2
Percentage*	35	47	42–58	44–62
Aluminum—Thousands of short tons				
As metal	29.4	16.7	2.9	3.2
In alloys	33.2	22.1	51.0	64.8
Total	62.6	38.8	53.9	68.0
Percentage	38	26.5	38–70	35–58
Nickel—Thousands of short tons				
As metal	0.9	0.8	2.9	5.2
In alloys†	1.5	1.5		
Total	2.4	2.3	2.9	5.2
Percentage*	5	10	5–35	6–46
Antimony—Thousands of short tons				
As metal	11.5	7.8	9.8	11.4
In alloys	0.8	0.7		
Total	12.3	8.5	9.8	11.4
Percentage*	69	77	83–98	60–98
Platinum—Thousands of troy ounces	55.9	44.7	45.4	47.7
O.P.M.‡—Thousands of troy ounces	16.4	19.7	18.0	18.8
Gold—Thousands of troy ounces	?	870.9	895.1	?
Silver—Thousands of troy ounces	?	18,438.8	24,972.3	?

*Ratio of secondary recovery to consumption of new metal; where a second figure appears, this is the percentage of the total secondary metal recovered from *old* materials, the remainder having come from the reworking of new plant scrap.
†Includes some in chemical compounds. ‡Other platinum group metals.

In addition to the nonferrous metals listed in the table there was consumed in the United States in 1940 a total of 44,530,000 short tons of ferrous scrap of all types, as compared with 36,327,000 tons in 1939. The 1940 total included 25,048,000 tons made in the consumers' own plants (mainly new scrap) and 19,482,000 tons of purchased scrap (mainly old scrap). In addition, exports of scrap in 1940 were 3,142,000 tons, against 4,015,000 tons in 1939, making the total ferrous scrap supply 47,672,000 tons in 1940 and 40,341,000 tons in 1939. These tonnages of scrap were considerably greater than the tonnages of pig iron produced (41,254,000 tons in 1940 and 31,076,000 tons in 1939), and compared with 59,806,000 tons of steel made in 1940 and 47,142,000 tons in 1939. (G. A. Ro.)

Second World War: *see* WORLD WAR II.

Secret Service, U. S.

The United States secret service is a division of the treasury department and is one of the oldest federal law-enforcement agencies, having been established during the Civil War. Its major duties include the protection of the person of the president of the United States, the members of his immediate family and the president-elect; the policing of the White House and its grounds; the suppression of the counterfeiting and alteration of all government obligations; the protection of treasury buildings, money and securities, and the enforcement of other laws relating to the treasury department. The successful performance of the protective duties of the secret service in time of war is of vital importance to the United States, and such duties represent a grave and serious responsibility.

During the period 1932 to 1936, victims of passers of counterfeit money in the United States lost an average of $771,000 a year. In 1937, secret service chief Frank J. Wilson began an experiment designed to reduce counterfeiting losses by teaching Americans to know the difference between good and bad money. At the close of the fiscal year of 1937, counterfeiters' victims had lost only $519,000. The educational work was broadened, and in 1940, under the slogan, "Know Your Money," the secret service exhibited instructive motion-picture films and delivered enlightening talks to nearly 5,000,000 people. Beginning with the 1941 fall semester, the secret service succeeded in having its 32-page "Know Your Money" booklet introduced as a part of the regular curricula of junior and senior high schools throughout the United States.

The value of the secret service program of crime prevention through education, as opposed to the suppression of crime by the age-old methods of investigation, prosecution and imprisonment is indicated by the fact that for the fiscal year 1941, victims of counterfeit notes lost only $91,000, a startling drop of 88% from the 1936 average.

During the fiscal year 1941, the secret service made a total of 2,949 arrests, representing the following violations: 198 for making or passing counterfeit notes; 554 for making or passing bogus coins; 64 for making or passing altered currency; 1,859 for forging government checks; 25 for violation of the Gold Reserve act; 10 in counterfeit or altered stamp cases; 7 for violating the Federal Farm Loan act; 8 for making false claims against the government; and 224 for miscellaneous cases.

A total of 2,876 cases were disposed of, and in the cases brought to trial there were 2,572 convictions and 76 acquittals. In the other cases disposed of, 228 persons were dismissed, not indicted or died before the trial. Convictions were obtained in 97.1% of the cases brought to trial, and it is interesting to note that this percentage was exactly the same as for the fiscal year 1940. Secret service agents investigated 18,095 criminal cases and 3,534 noncriminal cases during the fiscal year 1941.

With the ever-increasing use of coin-operated merchandise vending machines, this form of American business has suffered stupendous monetary losses through the use of worthless coin slugs in place of genuine coins. Telephone and traction companies, cigarette vendors and others have suffered yearly losses of $5,000,000 as a result of this widespread fraud. During the fiscal year 1941, the secret service succeeded in obtaining an interpretation of the counterfeiting laws which permits federal prosecution of coin-slug manufacturers and dealers. Arrests were made in many parts of the nation, and convictions were obtained. A decided drop occurred in the use of slugs, and it was expected that the prompt action of the secret service would end this nation-wide and pernicious fraud.

It was not expected that the involvement of the United States in war would necessitate the cancellation of the long-range program of the secret service to prevent crime by education. (F. J. W.)

Securities: *see* LAW: *Securities;* BUSINESS REVIEW: *Securities and Banking;* STOCKS AND BONDS.

Securities and Exchange Commission.

Securities effectively registered with the Securities and Exchange commission under the Securities act of 1933 during the fiscal year ended June 30, 1941, aggregated $2,611,000,000, compared with $1,787,000,000 for the preceding fiscal year, and $2,579,000,000 for the year ended June 30, 1939. Securities proposed for sale by issuers amounted to $2,081,000,000 in the 1941 fiscal year as against $1,433,000,000 in the preceding year and $2,020,000,000 in the 1939 fiscal year. Of the indicated net proceeds from the sale of securities effectively registered during the 1941 period, repayment of indebtedness was highest with 73.6%, new money uses took 14.2% and the purchase of securities accounted for 11.9%. (*See* also STOCKS AND BONDS.)

The SEC had nine regional offices in 1941: at Fort Worth, Tex.; New York, N.Y.; Atlanta, Ga.; San Francisco, Calif.; Seattle, Wash.; Chicago, Ill.; Denver, Colo.; Cleveland, O., and Boston, Mass.

At the beginning of the fiscal year 1941, the enforcement section had pending 696 investigations of alleged violations of statutes which the commission administers. During the year, 484 additional investigations were initiated. Of this total of 1,180 cases, 548 were disposed of, leaving 632 cases pending on June 30, 1941. The commission instituted 34 civil proceedings during 1941, including 28 injunctive actions brought against 82 persons to restrict them from fraudulent and otherwise illegal practices in the sale of securities.

Up to July 1, 1941, the commission had referred 329 criminal cases to the department of justice, including 52 cases which were referred during the fiscal year 1941. Since the organization of the commission in 1934, a total of 1,852 defendants had been indicted in 260 cases, including 27 cases which had been referred to the post office department. Convictions had been obtained against 739 defendants in 200 cases, representing 93% of the 213 cases which had been disposed of as to principal defendants.

Investment advisers registered with the commission under the Investment Advisers act (also administered by the SEC) on June 30, 1941, numbered 753, approximately 85% of which had commenced their investment advisory activities after 1930.

Holding Companies.—On June 30, 1941 there were 147 public utility holding companies registered under the Holding Company act of 1935, which is also administered by the SEC. The consolidated assets of these companies exceeded $15,000,000,000. The 147 registered holding companies constituted 53 public utility holding company systems, which included 1,457 holding, subholding and operating companies. During the fiscal year 1941, applications covering more than $1,065,000,000 of new securities became effective under the Holding Company act, bringing the total of new securities issued since the effective date of the act, Dec. 1, 1935, to more than $3,951,000,000. (*See* also PUBLIC UTILITIES.)

Bankruptcy Reorganizations.—The commission actively participated during the 1941 fiscal year in 145 reorganization proceedings under chapter X of the National Bankruptcy act. These proceedings involved the reorganization of 177 companies and were scattered among federal district courts in 28 states. The aggregate stated assets of the 177 companies totalled around $2,214,653,000, while the aggregate indebtedness was about $1,354,374,000.

The chairman of the commission in 1941 was Edward C. Eicher, of Iowa. Other members were: Robert E. Healy, of Vermont; Sumner T. Pike, of Maine; Ganson Purcell, of New York; and Edmund Burke, Jr., of New York.

Seeing Eye.

This organization, which teaches dogs to guide blind people, began in 1928 when Morris Frank brought his German shepherd, Buddy I, from Switzerland and proved that the heaviest New York street traffic could be negotiated safely. Buddy I was bred and trained by Mrs. Harrison Eustis and Elliott S. Humphrey. In 1941, 630 educated dogs, graduates of the Seeing Eye at Morristown, N.J., were acting as the liberators of some 500 men and 130 women. In almost every state in the union, and also in Canada, these dogs with their blind masters were engaged in such professions and businesses as law, the ministry, music, beekeeping, storekeeping, poultry raising, pharmacy, undertaking, journalism, electrical and radio engineering. Dogs and their self-reliant blind owners were attending colleges and keeping house; one pair was a professor of physics, one a mayor, one a judge, one an alderman. Moreover, the Seeing Eye had committees in New York, N.Y.; Philadelphia, Pa.; Boston, Mass.; Cleveland, O.; Detroit, Mich.; Chicago, Ill., and Los Angeles, Calif., to explain its work to a sympathetic public. Three years are required to train a man to train a dog, three months to train a dog, and a month to teach the blind person how to handle his trained dog. Not every blind man or woman is physically and mentally strong and alert enough to use a Seeing Eye dog; but every person who finally gets one discovers literally the difference between night and day. (B. TA.)

Seismology.

In spite of the tendency to discontinue scientific activity not directly related to war-making effort, the scarcity of materials and the adverse conditions in formerly active countries, there was in 1941 a surprising amount of continuity of effort. The activity of international seismological organizations was curtailed but not entirely stopped.

The only major earthquake, that of Nov. 25, 1941, was beneath the sea about 600 mi. westward from Lisbon, Portugal. It caused no important damage. There were no highly destructive earthquakes, but in ten there was an appreciable loss of life and property. There were moderately destructive shocks in California on Oct. 21 and Nov. 14.

Strong-motion records continued to be obtained and that of the earthquake off Santa Barbara on June 30, 1941, and further analysis of the Imperial valley earthquake of May 18, 1940, gave additional information for the design of earthquake-proof structures. Analysis of strong-motion records showed that the earth's motion at the start of an earthquake can be accurately measured.

Among the developments of 1941 were a new seismograph for recording vertical motion and an appraisal of the seismicity of the earth, based on instrumentally located earthquakes.

No progress was made toward accurate earthquake prediction, but the determination of crustal movement by geodetic measurements continued. Such movements may indicate a state of strain which may ultimately be relieved by earthquake. The possible effect of loading due to a large artificial lake in producing earthquakes was studied. Application of tectonics, especially the simulation in the laboratory of the pressure of the earth's crust, was investigated.

(*See* also DISASTERS: *Natural Disasters.*) (N. H. H.)

Selective Service. During the year 1941 approximately 1,000,000 men were inducted into the U.S. army by Selective Service. The figures by months are as follows:

January	73,000	July	58,200
February	90,200	August	53,000
March	153,200	September	41,500
April	123,200	October	86,900
May	56,900	November	51,200
June	114,200	December	29,000

These men were inducted after being found available and physically fit for service by their local boards and classified in I-A. Altogether, a total of 14,928,600 men were classified, 495,000 being deferred for occupational reasons and placed in II-A and II-B, and 9,536,000 deferred for dependency and placed in Class III. About 1,448,000 men were deferred for miscellaneous reasons and placed in Class IV.

Concluding six months' service as director of Selective Service, C. A. Dykstra resigned on April 1 to accept appointment by President Roosevelt as chairman of the National Defense Mediation board.

Brigadier General Lewis B. Hershey, who had been executive officer of the joint army and navy Selective Service committee since 1936 and was largely responsible for planning the operations and organization of Selective Service, became acting director in his capacity of deputy director of Selective Service, a post he had held under Dykstra since the creation of the Selective Service system.

President Roosevelt proclaimed July 1, 1941, as registration day for those men who had reached the age of 21 between Oct. 16, 1940, the first registration day, and July 1, 1941, the second registration day.

Approximately 752,500 men were registered. Indicative of the keen public interest in the second registration and the wide public desire to be of service were the countless proffers from organizations and individuals who offered their services voluntarily to assist in the registration.

On July 17 the second national lottery was held in the Departmental auditorium in Washington, D.C., where the first lottery was held on Oct. 29, 1940. This lottery was held in exactly the same manner as the first lottery, except that 800 numbers were drawn instead of the 9,000 used in the first lottery. These 800 numbers were placed in opaque capsules and on the day of the lottery were stirred into the historical fish bowl which had been brought from Independence hall in Philadelphia, Pa. It was the same bowl used in the World War I draft lottery and in the first Selective Service lottery in 1940.

Secretary of the Navy Knox, who was to have drawn the first number, declined by announcing to the crowded auditorium that he wanted that honour to go to one of the group of 50 conscripted men who had been brought to Washington from neighbouring army camps to participate in the drawing. Staff Sergeant Robert W. Shackleton of Fort Dix, six months before an actor on Broadway, reached into the goldfish bowl and drew forth the first number—196. Secretary of the Navy Knox drew the second number. The lottery lasted from 7 P.M. until 9.27 P.M. As a result of the lottery, those men who had registered on July 1 were integrated into the list of men that had registered in the first registration and had received their order numbers in the first lottery.

Men who had been accepted for service by the local board were notified to report for induction. After winding up their personal affairs, which in some cases involved the sale of personal property, such as automobiles and furniture, and the severance of certain civilian ties, many of these men upon examination by the army examiners at the induction station were declared unfit and were returned to their home communities and placed in Class I-B, as fit only for limited military service, or in IV-F, as unfit for any military service.

Immediate steps were taken to minimize the hardship to the registrants and expense to the government thus incurred. A system of preinduction examination was inaugurated.

Under new plans each state was divided into districts, with the army physicians conducting examinations of drafted men in each of the districts. In the more congested areas an examination station functioned at all times; while in the sparsely settled districts the tests were given at periodic intervals.

Classification Status of Selective Service Registrants by State as of Sept. 30, 1941—Class 1-A to Class 1-BO

State	Registered (All ages) Number	Classified (All ages) Number	Classified % of Total Registered	Class 1-A and 1-AO Total Projected (All ages) Number	Class 1-B & 1-BO Number	Class 1-B & 1-BO % of Registered (21–27)
U. S. (Continental)	17,370,355	14,680,650	84.6	1,674,275	488,502	6.1
Alabama	367,703	336,172	91.4	36,804	6,052	3.9
Arizona	66,429	61,656	92.8	6,802	1,326	4.3
Arkansas	248,664	219,564	88.3	23,478	5,360	4.5
California	1,000,960	957,010	95.6	71,966	20,939	7.2
Colorado	142,240	124,910	87.8	14,927	1,656	2.7
Connecticut	237,108	179,118	75.5	22,960	6,973	6.2
Delaware	36,942	36,189	98.0	3,060	2,029	12.7
Dist. of Columbia	119,502	89,751	75.1	11,415	5,527	10.4
Florida	266,208	187,971	70.6	23,837	8,673	7.4
Georgia	420,070	391,391	93.2	30,072	10,787	5.5
Idaho	74,427	65,724	88.3	6,428	1,600	5.0
Illinois	1,063,618	834,870	78.5	107,704	31,737	6.6
Indiana	438,922	378,668	86.3	39,511	12,393	6.2
Iowa	301,433	192,481	63.9	26,552	8,492	6.0
Kansas	206,437	188,347	91.2	20,049	3,524	3.8
Kentucky	351,175	319,736	91.0	33,472	7,253	4.3
Louisiana	327,599	300,597	91.8	35,274	9,698	6.2
Maine	98,523	82,838	84.1	7,946	2,872	6.0
Maryland	255,234	238,049	93.3	19,737	9,401	8.1
Massachusetts	530,203	444,125	83.8	51,164	13,618	5.5
Michigan	715,724	617,094	86.2	69,404	23,357	7.2
Minnesota	347,992	165,175	47.5	46,143	6,573	4.0
Mississippi	277,436	267,721	96.5	21,828	9,974	7.5
Missouri	466,844	389,130	83.4	42,305	11,652	5.6
Montana	77,071	66,318	86.0	9,052	1,542	4.5
Nebraska	152,099	135,788	89.3	15,971	3,615	5.2
Nevada	18,082	16,102	89.0	1,705	443	5.5
New Hampshire	58,601	41,868	71.4	5,250	1,489	5.4
New Jersey	575,630	487,558	84.7	62,960	17,370	6.6
New Mexico	69,589	66,081	95.0	6,137	1,985	6.5
New York	1,801,833	1,550,592	86.1	201,017	68,211	8.7
North Carolina	479,508	405,570	84.6	46,303	11,578	4.9
North Dakota	80,579	65,070	81.5	9,729	1,541	4.1
Ohio	896,898	850,013	94.8	91,768	26,561	6.2
Oklahoma	283,074	277,771	98.1	18,419	5,836	4.7
Oregon	141,255	113,272	80.2	12,241	2,325	3.7
Pennsylvania	1,313,509	931,033	70.9	138,607	43,834	7.2
Rhode Island	90,203	68,032	75.4	10,151	2,077	4.7
South Carolina	254,324	233,054	91.9	18,223	8,841	6.7
South Dakota	75,309	70,900	94.1	9,107	1,684	4.7
Tennessee	390,882	328,994	84.2	35,949	9,325	5.1
Texas	809,332	790,393	91.6	70,871	12,728	3.3
Utah	69,167	65,504	94.7	5,127	1,507	4.6
Vermont	41,899	35,502	84.9	3,017	1,379	7.0
Virginia	367,312	308,071	83.9	32,194	9,797	5.5
Washington	227,088	123,411	54.3	20,590	3,028	4.0
West Virginia	252,272	227,019	90.0	29,234	5,060	4.3
Wisconsin	388,851	323,788	83.3	33,931	13,843	7.8
Wyoming	34,526	31,790	92.1	3,084	547	3.6
Hawaii	64,950	46,259	71.2	6,023	984	3.3
Puerto Rico	261,476	192,733	73.7	46,741	5,374	3.8

Source: Periodic Reports Section, Research and Statistics Division, Jan. 15, 1942.

Class 1-A. Available for general military service when found acceptable to the land or naval forces.

Class 1-AO. Available for noncombatant general military service when found acceptable to the land or naval forces; conscientious objector.

Class 1-B. Available for limited military service when found acceptable to the land or naval forces.

Class 1-BO. Available for noncombatant limited military service when found acceptable to the land or naval forces; conscientious objector.

Table I.—*Estimated Number of Registrants Found to be Unqualified for General Military Service Because of Physical and Mental Reasons, by Availability for Military Service and by Defect or Disease*

Major defect or disease	Unqualified for general military service by selective service*			Unqualified for general military service by the army†	Total unqualified for general military service	Percentage of estimated total unqualified for general military service
	Qualified for limited military service	Disqualified for any military service	Total			
Teeth	100,000	53,000	153,000	35,000	188,000	20.9
Eyes	72,000	28,000	100,000	23,000	123,000	13.7
Cardiovascular system	17,000	67,000	84,000	12,000	96,000	10.6
Musculo-skeletal	27,000	25,000	52,000	9,000	61,000	6.8
Venereal	35,000	14,000	49,000	8,000	57,000	6.3
Mental and nervous	8,000	30,000	38,000	19,000	57,000	6.3
Hernia	35,000	11,000	46,000	10,000	56,000	6.2
Ears	7,000	18,000	25,000	16,000	41,000	4.6
Feet	21,000	9,000	30,000	6,000	36,000	4.0
Lungs ‡	6,000	11,000	17,000	9,000	26,000	2.0
Miscellaneous	72,000	54,000	126,000	33,000	159,000	17.7
Total	400,000	320,000	720,000	180,000	900,000	100.0

*These estimates are based on classification reports from local boards as to the number qualified for limited military service, the number disqualified for any military service, and the rate of rejections by groups of defects or diseases by availability for military service as revealed in an analysis of 19,923 reports of physical examination. The major defect or disease for each registrant was determined by the principal cause of rejection.

†These estimates are based on the classification reports from local boards as to the total number found unqualified for general military service at the army induction station, and the rate of rejections by groups of defects or diseases as revealed in an analysis of 123,000 reports of physical examination at the army induction station as released by the war department. The major defect or disease for each registrant was determined by the principal cause of rejection.

No data were available to permit a breakdown by cause of rejection and availability for military service for registrants rejected by the army. Classification reports from local boards indicate that only 70,000 of the 180,000 found to be unqualified for general military service by the army induction stations are classed as available for limited military service. Based on limited observations, it is believed that the ratio of the number acceptable for limited military service to the total number unqualified for general military service by the army is much greater than the data indicate.

‡Including tuberculosis.

The period between the time of examination and the time of induction gave registrants ample opportunity to make final arrangements concerning their financial and other personal affairs. Whenever possible, registrants were permitted to return to their homes on the same day they were examined by army physicians. In certain areas, however, Selective Service doctors conducted "screening examinations" to eliminate men obviously unfit for military training.

Commanders of the army corps areas started working with the state Selective Service directors in the early autumn of 1941 to make the program effective as rapidly as possible. However, aside from these considerations, one staggering and shocking fact emerged from the physical examining of large numbers of U.S. young men. More than half of the 21- to 36-year-old men examined for induction were found to be physically or mentally unfit for general military service.

Physical Condition of Registrants.—In 1941 the Selective Service system was making an analysis of the reports of physical examination for each registrant examined, in accordance with the provisions of the Selective Training and Service Act of 1940. Pending the complete analysis of these reports, a survey was made of 19,923 reports to provide an indication as to the physical fitness of American youth between the ages of 21 and 36 for military service. This sample was stratified by states for representativeness and included a cross-section of registrants examined.

Summary reports from local boards, and a sample analysis of reports of physical examination by Selective Service local boards and army induction stations, indicated that about 50% of the approximately 2,000,000 registrants who were examined were found to be unqualified for general military service because of physical, mental and educational reasons. Of the approximately 1,000,000 registrants who were not qualified for general military service, 900,000 were so classified because of physical and mental defects and 100,000 because of the lack of educational qualifications.[1] Of the 900,000 rejected for physical and mental reasons, 470,000, or 23% of those examined, were qualified for limited military service, and 430,000, or 22% of those examined, were disqualified for military service.

Based on the physical standards, only about 1,000,000 men, of the approximately 2,000,000 examined, were qualified for any type of military service in the army immediately, and at least 500,000, or 25%, were available for the performance of military duties in a slightly limited capacity. Thus, out of the approximately 2,000,000 examined, at most, 25% were not qualified for any type of military service.[2]

Based on the major defect or principal cause of rejection, dental defects accounted for an estimated 188,000, or 20.9% of the 900,000 registrants not qualified for general military service by Selective Service local boards and army induction stations; defects of the eyes, 123,000, or 13.7%; defects or diseases of the cardiovascular system, 96,000, or 10.6%; musculoskeletal defects, 61,000, or 6.8%; venereal diseases, 57,000, or 6.3%; mental and nervous diseases, 57,000, or 6.3%; hernias, 56,000, or 6.2%; defects of ears, 41,000, or 4.6%; defective feet, 36,000, or 4.0%; defects of lungs, including tuberculosis, 26,000, or 2.9%; and miscellaneous defects, 159,000, or 17.7%. Included in the miscellaneous group were defects and diseases of the mouth and gums, nose, throat, kidneys and urinary system, abdomen, genitalia, skin, haemorrhoids, varicose veins, tumours, and infectious and parasitic diseases.

Table II.—*Incidence of Defects Found in 19,923 Registrants Examined by Selective Service Local Boards, by Broad Classifications*

Disease or defect	Number of defects found	Rate of defects per 1,000 examined
Eyes	2,305	115.7
Ears	887	44.5
Teeth	2,795	140.3
Mouth and gums	1,273	63.9
Nose	1,372	68.9
Throat	1,321	66.3
Lungs	327	16.4
Tuberculosis	114	5.7
Cardiovascular system	2,000	100.4
Blood and blood-forming organs	19	1.0
Hernia	1,287	64.6
Kidneys and urinary system	279	14.0
Abdominal viscera	244	12.2
Genitalia	1,175	59.0
Venereal	695	34.9
Skin	2,308	115.8
Haemorrhoids and rectal defects	610	30.6
Varicose veins	531	26.7
Mental and educational deficiency and illiteracy	239	12.0
Mental disorders	362	18.2
Neurological	454	22.8
Musculo-skeletal	2,018	101.3
Feet	2,888	145.0
Endocrine disturbances	319	16.0
Tumours	228	11.3
Infectious, parasitic and epidemic diseases	7	0.4
Other diseases and defects	974	48.9
TOTAL	27,031	1356.8

[1]The minimum educational requirement for a registrant to be inducted into the army is the ability to read and write the English language as well as a student who has satisfactorily completed the fourth grade in an American grammar school.

[2]There seems to be little doubt but that most of the registrants being classed as available for limited military service, and a substantial portion of the registrants being classed as disqualified for any military service in the United States army, possess health conditions which would be acceptable for military duty in any army in continental Europe. United States army regulations, in setting forth the physical standards, prescribe health conditions that must be attained at the time of physical examination by Selective Service registrants for induction into the army. Such regulations provide only minor differences in standards between registrants qualified for general military service and registrants qualified for limited military service. These regulations are predicated upon the assumption that registrants qualified for general military service should be physically, mentally and educationally capable of performing any service that a soldier of the army may be called upon to do, while the registrants qualified for limited military service should be physically, mentally and educationally capable of performing such of the routine chores of the army as the limitations of the soldier permit. Registrants being classed as available for limited military service were not being accepted by the army in 1941.

Table III.—*Age of Registrants by Availability for Military Service*

Age*	Number examined	Percentage of total examined	Qualified for general military service		Qualified for limited military service		Disqualified for military service	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
18†	153	0.8	129	84.3	8	5.2	16	10.5
19†	143	0.7	118	82.5	13	9.1	12	8.4
20†	127	0.6	94	74.0	17	13.4	16	12.6
21	2,083	10.4	1,469	70.5	347	16.7	267	12.8
22	2,688	13.5	1,810	67.3	511	19.0	367	13.7
23	2,248	11.3	1,504	66.9	393	17.5	351	15.6
24	1,872	9.4	1,222	65.3	343	18.3	307	16.4
25	1,692	8.5	1,034	61.1	331	19.6	327	19.3
26	1,492	7.5	905	60.7	276	18.5	311	20.8
27	1,189	6.0	682	57.4	268	22.5	239	20.1
28	1,071	5.4	576	53.8	260	24.3	235	21.9
29	839	4.2	435	51.8	213	25.4	191	22.8
30	809	4.4	400	46.0	226	26.0	243	28.0
31	697	3.5	306	43.9	188	27.0	203	29.1
32	681	3.4	282	41.4	188	27.6	211	31.0
33	669	3.4	282	42.4	188	28.1	199	29.7
34	602	3.0	212	35.2	159	26.4	231	38.4
35	527	2.6	176	33.4	172	32.6	179	34.0
36	157	0.8	47	29.9	54	34.4	56	35.7
Unknown	124	0.6	71	57.2	29	23.4	24	19.4
Total	19,923	100.0	11,754	59.0	4,184	21.0	3,985	20.0

*Age at last birthday at time of physical examination.

†Nonregistrants who have volunteered for one year of military service with the army. The Selective Training and Service Act of 1940 provides that nonregistrants between the ages of 18 and 20, inclusive, shall be afforded an opportunity to volunteer for training and service into the land and naval forces of the United States.

SGT. R. W. SHACKLETON, trainee of Ft. Dix, N.J., drew the first capsule—number 196—at the second national selective service lottery July 17, 1941 in Washington, D.C.

Selective Service local boards classed approximately 41% of all registrants physically examined as available for limited military service or disqualified for any military service. Of the 59% examined by local boards and classed as available for general military service, approximately 15% (or 9% of the total number examined by the local boards) were rejected at the army induction stations for borderline physical or mental conditions, diseases and defects obtained since the time of the local board examination, educational deficiencies, and other miscellaneous reasons.

The president charged the Selective Service system with the administration of a program for the physical rehabilitation of rejected men who could be completely and permanently rehabilitated at a reasonable cost in a reasonably short period of time, and made available for general military service in the armed forces. Of the 900,000 who were classed as available for limited military service or disqualified for military service, an estimated 200,000 could be completely physically rehabilitated for the performance of general military service. Perhaps one-half of those who had remediable defects, or 100,000, had dental defects that could be successfully corrected.

There is presented in Table I the estimated number of registrants classed as unavailable for general military service, because of physical and mental reasons, in the first 2,000,000 registrants examined by Selective Service local boards and army induction stations, by availability for general military service and by major defects or diseases.

Age Distribution.—Two-thirds of the registrants physically examined by local boards were between the ages of 21 and 27, inclusive. Registrants between the ages of 28 and 36, inclusive, accounted for 31.3% of the total number examined. The number of nonregistrants who volunteered for one year of military service with the army accounted for 2.1% of the total registrants examined.

The rate of rejections for registrants between the ages of 31 and 36, inclusive, was nearly twice as great as that for registrants between the ages of 21 and 25, inclusive. Of the registrants between the ages of 31 and 36, 61% were unacceptable for general military service, as compared with 45% between the ages of 26 and 30, and 34% between the ages of 21 and 25. The average age of registrants called up for physical examination by local boards was 25.8 years. The percentage who were qualified for general military service varied from 70.5% for registrants 21 years old to 29.9% for registrants who were 36 years old at the time of physical examination. The striking relationship that existed between age and availability for general military service is shown in Table III.

Race, Urban-Rural Residence and Place of Birth.—The ratio of Negro registrants to the total number examined was approximately the same as the ratio of Negroes to the total population. Registrants of other races, which accounted for less than 1% of the total number examined, were mainly Chinese, Japanese and Indians.

Two-thirds of the registrants examined were from urban communities. The rate of acceptance for general military service was 61.9% for registrants from rural areas compared with 57.6% for registrants from urban areas.

Of all registrants examined, 97.3% were born in the United States or its territories. The place of birth of registrants of other nativity was Canada, British Isles and Europe, in the order of importance given.

The number of registrants examined, according to availability for military service by race, urban-rural community and place of birth, is shown in Table IV.

Height, Weight and Chest Measurement.—The average height of the registrants examined was 67.5 in., the average weight 150 lb., and the average chest measurement at expiration was 33.9 in. Registrants who were classed by local boards as available for general military service averaged 68.1 in. in height and weighed 152 lb.

The height of registrants examined varied from 54 in. to 88 in.; 98.3%, however, were between 60 in. and 78 in., which is the minimum and maximum height, respectively, for admittance into the army. Registrants varied in weight from 85 lb. to 385 lb., and 93% were between 100 lb. and 190 lb. The minimum weight for admittance into the army for a registrant 60 in. tall is 105 lb. and the standard weight for a registrant 78 in. tall is 184 lb.

Discretion and judgment is used, however, in determining the availability for military service of registrants with slight variations in the ratio of weight to height.

While many obvious reasons make direct comparisons with data compiled in previous emergencies impossible, it is interesting to note that the average height of recruits examined during World War I was 67.5 in., the average weight was 142 lb., and the average chest measurement at expiration was 33.2 in. It is estimated that the average height for men examined for military service in the federal forces during the Civil War was 67.5 in., the average weight was 136 lb., and the average chest measurement at expiration was 33.5 in.

Vision and Hearing.—Of the registrants tested for vision without correction, 71% could see as well as, or better than, normal (20/20) and 91% had vision equivalent to, or better than, the minimum requirements for acceptance into the army (20/40 or better). Of the registrants, 6% had a vision of between 20/40 and 20/100 without correction, 2% had a vision of 20/200 without correction, and only 1% had a vision of 20/400, or worse, without correction.

Fewer registrants had as severe impairment of hearing as of vision. Of the registrants who had their hearing tested, 95% possessed normal hearing, or better, and 99% could hear as well as was necessary for entrance into the army.

Occupation.—Of the registrants physically examined, about 14% were unemployed. The largest group of employed registrants physically examined was operatives and kindred workers, which comprised about one-fifth of all registrants examined. The most numerous types of operatives and kindred workers were chauffeurs, truck drivers and deliverymen, and operatives in metal, textile and mining industries, such as weavers, knitters, spinners, assemblers, operators of lathes, drill presses and other machines.

Farmers and farm labourers were the second largest employed group, accounting for 14% of the total number examined. Labourers, except on farms and in mines, accounted for 11% of all registrants examined.

The next largest group was craftsmen and foremen, which comprised more than 8% of all registrants physically examined. The most numerous occupations in this group were carpenters, cabinet makers, pattern makers, mechanics, repairmen, machinists, millwrights, toolmakers, painters, paper hangers, printers and foremen.

Clerical and kindred workers made up nearly 8% of those examined, with domestic, protective and other service workers accounting for better than 5% of those examined. The remaining registrants who were employed at the time of physical examination included professional workers, semi-professional workers, salesmen and emergency workers. Approximately 1% of all registrants examined was students.

Prehabilitation and Rehabilitation.—In May 1941, in an effort to cut down the appalling rate of 50% rejections for physical disabilities, Selective Service inaugurated a physical prehabilitation program for registrants. It was entirely voluntary and essentially an educational project.

Physicians, dentists and registrants alike co-operated and the program met with some success; however, stronger and more positive measures were required. In Oct. 1941 President Roosevelt announced a rehabilitation program which called for the correction of minor defects of 200,000 men who had been placed in Class I-B as "fit only for limited military service."

Soon after the president's announcement, Brigadier General Hershey called a conference of representatives of all interested agencies, both governmental and civilian; medical, dental and lay. On the basis of past studies and these conferences, it was determined to begin the Selective Service Rehabilitation program for treatment of registrants having correctable defects.

Re-Employment Program.—The demobilization of nearly 5,000,000 men after World War I presented a re-employment problem of great magnitude.

Table IV.—*Race, Urban-Rural Residence and Place of Birth of Registrants by Availability for Military Service*

Item	Number examined	Percentage of total examined	Qualified for general military service		Qualified for limited military service		Disqualified for military service	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Race								
White . . .	17,480	87.8	10,351	59.2	3,615	20.7	3,523	20.1
Negro . . .	2,258	11.3	1,296	57.4	540	23.9	422	18.7
Other . . .	152	0.8	91	59.9	25	16.4	36	23.7
Not specified	24	0.1	16	66.6	4	16.7	4	16.7
Urban-rural*								
Urban areas.	13,333	66.9	7,675	57.6	2,996	22.5	2,662	19.9
Rural areas .	6,590	33.1	4,079	61.9	1,188	18.0	1,323	20.1
Place of birth								
United States and territories	19,387	97.3	11,460	59.1	4,046	20.9	3,881	20.0
Other . . .	496	2.5	270	54.4	126	25.4	100	20.2
Not specified	40	0.2	24	60.0	12	30.0	4	10.0
Total	19,923	100.0	11,754	59.0	4,184	21.0	3,985	20.0

*Urban areas were those communities of 2,500 population or over and rural areas were those of less than 2,500 population.

The veteran camps of the Civilian Conservation Corps bore mute witness to the size of this problem and the difficulties encountered in restoring ex-soldiers to civil life, for at one time there were as many as 30,000 such men in the CCC camps. That a total of 213,000 individual World War I veterans had been enrolled in these civilian camps during the 23 years after the end of the war was proof of the need of a comprehensive re-employment program. The figure might have been larger except for the fact that the veteran enrolments were limited by law to not more than 10%.

To guard against a repetition of this experience, the congress provided, in section 8 of the Selective Training and Service Act of 1940, for the director of Selective Service to establish a personnel division with adequate facilities to render aid in the replacement of inductees in their former positions and in securing positions for inductees. Legislation made the re-employment benefits available to all members of the military and naval forces of the United States who entered the service subsequent to May 1, 1940.

Great Britain had recognized the re-employment problem which follows demobilization. The National Service (Armed Forces) Act, 1939, 283 Geo. 6 ch. 81, imposed the duty, except certain legal defenses, upon each employer of a man called for military or naval service to reinstate the man in employment under conditions not less favourable to the man than if he had remained in continuous employment. Violations subjected the employers to a fine of not more than £50 and the court could compel the employer to pay the employee an amount equal to 12 weeks' wages.

In the United States no provisions were made for handling re-employment in the studies prepared by the joint army and navy Selective Service committee, although the importance of the problem was fully realized. It was anticipated that this work would in all probability be entrusted to some other agency.

Within a week of the passage of the Selective Service Act of 1940, the Selective Service system started studies looking to the establishment of an adequate "personnel section," as called for in section 8 of the Selective Service act.

The Re-employment Program in Operation.—The entire re-employment procedure of Selective Service system was highly decentralized. General principles and policies were formulated in the national headquarters. These were then transmitted to the state headquarters of Selective Service, which adapted them to their own use. The plans were then transmitted to the local boards within the respective states. For the United States at large there were 6,443 local boards and with each one there was associated at least one re-employment committeeman, who was responsible for seeing that men returning from the armed forces were reabsorbed into gainful employment. In carrying out this plan, the re-employment committeeman was responsible for seeing that the returning person be reinstated in his old position, if he had one and desired to return to it, or that new jobs were found for the men who were not employed at the time they entered the service or who, for one reason or another, desired to seek new positions.

Due to the changes in the Selective Service act authorizing the discharge, between Sept. 1 and Dec. 10, of certain men who had attained age 28, the war department directed that some 200,000 men be transferred from active service to the reserve, and that this be accomplished not later than Dec. 10, 1941. This group of men had largely been transferred to the reserve at the time the United States declared war on Japan on Dec. 8, 1941.

In handling the re-employment problems of the men who were released from active service between Sept. 1 and the time the U.S. entered the war, there was an excellent opportunity to try out the plans which had been formulated by the national headquarters of Selective Service, and which had been adapted in the several states to meet their respective needs.

A co-ordinated program was developed in conjunction with the National Selective Service system, the United States Employment service, the State Employment service, the state headquarters of Selective Service and the local boards. Certain staff members in the state headquarters of the employment service, and also in the branch offices, were designated as specialists to handle the re-employment problems of men returning from the service. In addition, and at the invitation of the war department, the state employment service established emergency referral offices in the army posts which contained 8,000 or more soldiers, and an itinerant service was arranged for the smaller posts. Through the emergency referral offices and by the visitation service thus established, interviews were held with men about to be released, if it appeared that they would meet the standards required for certain defense activities—referred to as the "critical labour supply." In many instances it was found that men about to be discharged possessed the necessary qualifications to render great service in the defense activities, and in such instances if the man was willing, he was interviewed by the employer and put to work at once.

For those men who did not meet the requirements for the "critical labour supply" or for one reason or another preferred to return to their homes, re-employment assistance was given, if they desired it, when and as they asked for it. The law required, however, that in order for a man to be entitled to the re-employment assistance, he must apply for his old job within 40 days after his release from the armed forces. It also provided that after he had been reinstated, he could not be released, without due cause, for a period of at least one year.

From the experience obtained, it appeared that employers, generally, co-operated wholeheartedly in the reinstatement of their employees to positions which they had held at the time they entered the armed forces.

Legislative Changes in 1941.—During the year 1941, the 77th congress passed five direct amendments to Public Law 783, passed by the 76th congress, which set up the Selective Service system.

Public Law 87 (H.R. 4125) was approved by the president on May 29, 1941. This law extended the exemption of liability to training and service to men who have completed three consecutive years of satisfactory service in the army, navy, marine corps or coast guard. It also clarified the exemption extended to the national guard.

Public Law 206 (S. 1524) was approved by the president on Aug. 16, 1941. This law in the main provided deferment for registrants above 28 years of age, and for the release of such men already inducted. It provided for the publication of the names and classifications of men classified by local boards. It also reduced to two years and six months the service period required for men who had been discharged for the convenience of the government in order to obtain exemption from training and service.

Public Law 213 (S.J. Res. 95) was approved by the president on Aug. 18, 1941. The principal provision of this law was to extend the period of training and service to 30 months. It also provided certain rights for National Service Life Insurance, and it provided for release from service of certain men having dependents and provided for an increase of pay of $10 per month after one year of service.

Public Law 338 (S.J. Res. 117) was approved by the president on Dec. 13, 1941. This law removed any territorial restrictions on the use of selectees and extended the period of training and service for the duration and for six months after any war in which the U.S. might be engaged.

Public Law 360 (H.R. 6125) was approved by the president on Dec. 20, 1941. The main provisions of this law were: (1) provision for the registration of the man power of the United States between the ages of 18 and 65, and (2) provision for liability to service of those between 20 and 45.

Besides these direct amendments, the following three laws affected in some manner the administration of Selective Service:

Public Law 47 (S. 1524), approved May 5, 1941, removed the liability of criminal code sections 109 and 113 from lawyers holding Selective Service appointments.

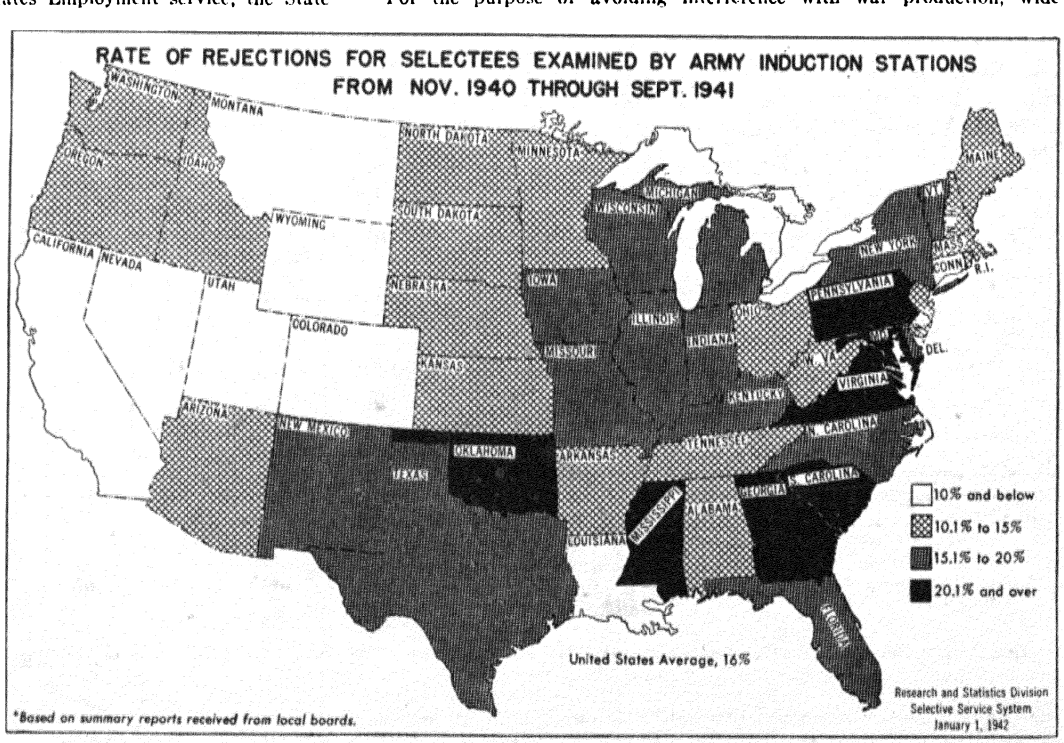
Public Law 163 (H.R. 2475), approved July 11, 1941, provided for the protection of morals around army and navy camps and stations.

Public Law 376 (S. 2082), approved Dec. 26, 1941, amended Public Law 47 and extended relief from sections 109 and 113 of the criminal code to state directors of Selective Service.

Selective Service in Total War.—Following the Japanese attacks on Hawaii and the Philippines and the subsequent declaration of war between the United States and Japan, Germany and Italy, the two additional amendments cited above (Dec. 13 and Dec. 20) were passed to enable recruitment of man power on a wartime basis.

These were followed by the issuance, on Jan. 5, 1942, of the president's proclamation requiring the registration on Feb. 16, 1942, of "every male citizen of the United States, and every other male person residing in the continental United States or in the territory of Alaska or in the territory of Hawaii or in Puerto Rico," with a few specific exceptions prescribed by the original act, who is between 20 and 45 years old and has not previously registered.

For the purpose of avoiding interference with war production, wide



latitude was allowed the director of each state and territory to conduct the Feb. 16 registration in his individual area in conformity with local conditions. In many places, therefore, this registration was to be started several days before Feb. 16, and in industrial centres registration was to be conducted in shops and factories.

The requirement for the Feb. 16 registration was that all men between 20 and 45 years old who had not registered before that date must do so then between 7 A.M. and 9 P.M. Specifically, the president's proclamation designated those required to register, as every man not previously registered who "on December 31, 1941, had attained the twentieth anniversary of the day of his birth and on February 16, 1942, had not attained the forty-fifth anniversary of the day of his birth."

This third registration also was to be followed by a national lottery to determine the order in which these 20- to 45-year-old men would be called for possible military service.

Subsequent registrations, to be called by the president, would enrol the man power that was not within the 20- to 45-year-old military age bracket—those 18 to 20 years old and those between 45 and 65 years of age.

With these registrations completed, a total of more than 41,000,000 would have registered. (*See* also DEFENSE, NATIONAL [U.S.]; HEART AND HEART DISEASES; INDIANS, AMERICAN.) (E. M. CN.)

Selenium. Although recovered as a by-product in copper refining in several countries, production statistics were in 1941 available only from the United States, where production amounted to 328,731 lb., sales to 368,709 lb., and imports to 134,429 lb. in 1940, all sharp increases over 1939. Canadian production had for several years been greater than that of the United States, and probably increased still more in 1940, following the heavy demand for copper. (G. A. RO.)

Senate: *see* CONGRESS, UNITED STATES.
Senegal: *see* FRENCH COLONIAL EMPIRE.
Serbia: *see* YUGOSLAVIA.

Serrano Suñer, Ramón (1901–), Spanish statesman, was born in Saragossa. While studying law in the University of Bologna, Italy, he became interested in left-wing political theories. On his return to Spain he practised law in Saragossa, and in 1933 he became a member of the cortes as a deputy of the Catholic party. Two years after the outbreak of the Spanish civil war in 1936, he was appointed minister for press and propaganda in the cabinet of the insurgents by his brother-in-law, Generalissimo Francisco Franco (*q.v.*). This position gave him complete control over press and radio. In 1937 he made a good-will visit to Germany, where he attended the Nürnberg nazi congress and met von Ribbentrop, Hitler and other ranking nazis. As a result of these visits and his talks with Mussolini and Ciano in Italy he succeeded in getting more axis war materials for the insurgent armies. On Oct. 18, 1940 he was made foreign minister of Spain. Serrano Suñer tied Spain to the coat tails of the axis in foreign policy, but dependence on Britain for food prevented a rupture with the Allies during 1940 and 1941. On Dec. 19, 1941, both he and Franco signed a decree announcing Spain's "non-belligerent" status in the Pacific war. (*See* also SPAIN.)

Serum Therapy. Biological products which are employed for the diagnosis, prophylaxis, modification and treatment of disease are commonly spoken of as serums and vaccines. The former include immune globulin, normal human plasma and serum, antitoxins, antibacterial and antiviral serums; the latter include toxins, antibacterial and antiviral vaccines, bacterial toxins, toxin-antitoxin mixtures and toxoids. One example will suffice to illustrate the various uses of such products. Determination of susceptibility to and diagnosis of scarlet fever involves the use of toxin; permanent and temporary immunity is developed by the use of toxin-antitoxin and convalescent serum; treatment by the use of antitoxin and convalescent serum.

The greatest usefulness of such preparations is in the prevention of disease. Success has been reported in the prevention of plague, cholera, diphtheria, gas gangrene, leishmaniasis, measles, whooping cough, rabies, smallpox, tetanus, scarlet fever, undulant fever, typhoid, paratyphoid, yellow and Rocky Mountain spotted fever in individuals susceptible to the disease. Such susceptibility can be determined by the use of suitable preparations for chancroid, diphtheria, leishmaniasis, tuberculosis, pneumococcic pneumonia, scarlet fever, typhoid, paratyphoid, typhus and undulant fever and trichinosis. Experimental work has been done on the diagnosis of meningitis and whooping cough and on the prevention of influenza, erysipelas, epidemics of cerebrospinal meningitis, pneumococcic pneumonia and chancroid, but the work was, up to Jan. 1, 1942, not conclusive and satisfactory procedures had yet to be established. Some of these preparations may be used to confirm the diagnosis when some of these diseases are suspected.

Occasionally it is desirable to confer a temporary immunity or modify the severity of a disease in susceptible persons as in the case of an infant or a debilitated child living in a family in which an infectious disease such as measles is rampant. Some diseases may be successfully treated or modified with serums or vaccines: acne caused by acne bacillus, anthrax, bacillary dysentery, botulism, diphtheria, erysipelas, gas gangrene, measles, meningococcic meningitis, plague, pneumococcic infections, tetanus, tularemia, undulant fever, catarrhal stages of whooping cough, rabies, snake bite (North American—rattlesnake, copperhead, water moccasin; South American—tropical rattler, fer de lance and other Bothrops; British Indian—cobra and viperine), spider bite (Black Widow spider) and scorpion bite. Serum or vaccine treatment of a number of these conditions requires extensive study before the evaluation is complete.

Serums for most of the various types of pneumococcic pneumonia were in 1941 available either as horse serums or rabbit serums (claimed to produce fewer reactions).

Serums and vaccines may be administered intradermally, subcutaneously, intramuscularly, intravenously or intrathecally according to the nature of the preparation, the disease and the necessity for prompt action. The value of oral vaccines was not established in 1941; intranasal application of vaccines was under extensive investigation but its value could not be determined. There were in 1941 no established immunizing agents for the treatment or prevention of the common cold, influenza, gonorrhoea and poliomyelitis. (P. C. B.)

Service Organizations, United: *see* UNITED SERVICE ORGANIZATIONS.
Seychelles: *see* BRITISH EAST AFRICA.

Shaposhnikov, Boris Mikhailovich (1882–), Russian army officer, was born in Zlatoust, Russia. He won a scholarship to the imperial academy of the general staff, was graduated in 1910 at the top of his class and was commissioned an officer in the Czarist army. In May 1918 he offered his services to the red army and was appointed an assistant commissar by Lenin and Trotsky. In 1921 he was awarded the order of the red banner. He served in the red army for 13 years before joining the communist party. In 1928 he was chief of staff of the red army, and in 1931 commander of troops in the Volga military district. In 1937 he became chief of the general staff and a member of the powerful central executive committee of the U.S.S.R. His plans were followed in the invasion of Poland in the fall of 1939, and he became generally recognized as the chief strategist of the red army when he succeeded in breaking Finnish resistance in the winter of 1940. In recognition of his achievements in the Finnish campaign, Stalin conferred on him the rank of marshal in

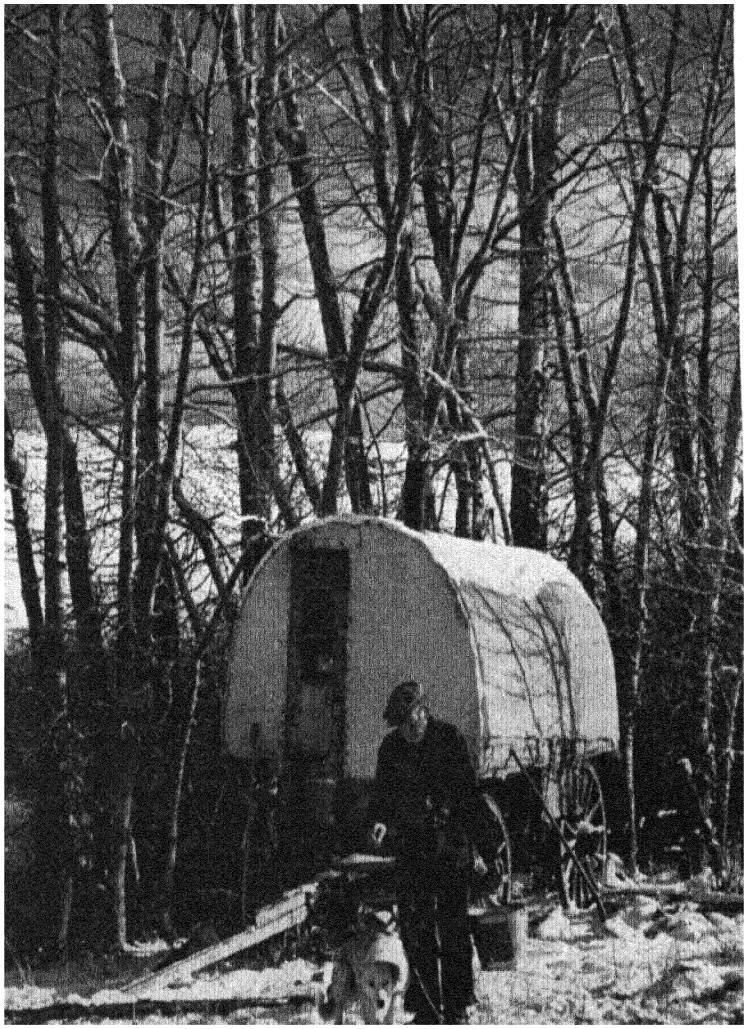
May 1940. He was said to have been the author of the three-front plan of defense against Hitler's armies in the German-Russian war, and on Oct. 31, 1941 he was recalled as soviet chief of staff.

Sharpening Stones: *see* ABRASIVES.

Sheep. Sheep raising in the United States entered 1942 with two new records, the largest lamb crop in the country's history and a larger number of sheep and lambs on feed Jan. 1, 1942 than on any previous Jan. 1. The 1941 record lamb crop was 34,549,000 head, compared with 32,885,000 in 1940. The number of sheep and lambs on feed Jan. 1, 1942 was 6,775,000, an increase of about 5% over a year earlier. The United States department of agriculture did not ask for an increase in sheep numbers in its national defense food program for 1942, but it requested that slaughter of sheep and lambs be increased by 2% in 1942 over 1941. Slaughter of sheep and lambs in 1941 at federal-inspected plants amounted to 18,124,531 head, compared with 17,351,157 in 1940 and a five-year (1936–40) average of 17,427,656. The increase of 1,664,000 head in the lamb crop in 1941 was attributed to the addition of 500,000 breeding ewes to flocks and to the fact that three more lambs per 100 ewes were saved. More than two-thirds of the increase in the lamb crop was in the western states, and 15% of the increase was in Texas, where sheep raising had increased sharply. South Dakota, Montana and Wyoming also registered large increases. Flocks in western states Dec. 1, 1941 were reported in better condition than at any time on that date since 1928. Supplies of feed and water on winter ranges were reported good. The level of prices for sheep and lambs in 1941 was higher than in 1940. Good to choice-grade slaughter lambs sold in mid-December, 1941 in Chicago, Ill., at $2.75 higher than in Dec. 1940. Lamb prices in the summer and fall of 1941 were about $1.50 higher than in the similar period of 1940. (*See* also LIVESTOCK; MEAT; WOOL.)

(S. O. R.)

SHEEPHERDER'S WAGON on a Montana ranch



Sheppard, Morris (1875–1941), U.S. senator, was born May 28 in Wheatville, Morris county, Texas. He graduated from the Yale law school at the age of 23 and four years later, in 1902, he was elected to the 57th congress to fill the unexpired term of his father, John L. Sheppard, in the house. In 1913 he became a senator, filling another unexpired term. Sheppard was one of the authors of the 18th amendment and he fought a losing battle against its repeal in 1933. But on the anniversary of that repeal he would regularly address the senate on the evils of liquor. He was a member of many important senate committees. Chairman of the Military Affairs committee, he long advocated armed preparedness for the United States and played an important role in the passage of the Selective Service act in 1940. He died in Washington, D.C., April 9.

Shipbuilding. As of Dec. 1, 1941 there were approximately 9,800,000 dead-weight tons of seagoing merchant vessels under construction in the United States, and about 2,138,590 displacement tons of naval vessels, including those under construction in navy yards. As of the above date, 972,000 dead-weight tons of merchant vessels had been delivered in 1941 and 557,668 tons of naval tonnage commissioned. Employment figures indicated that nearly 400,000 workers were engaged in shipbuilding in private and public shipyards.

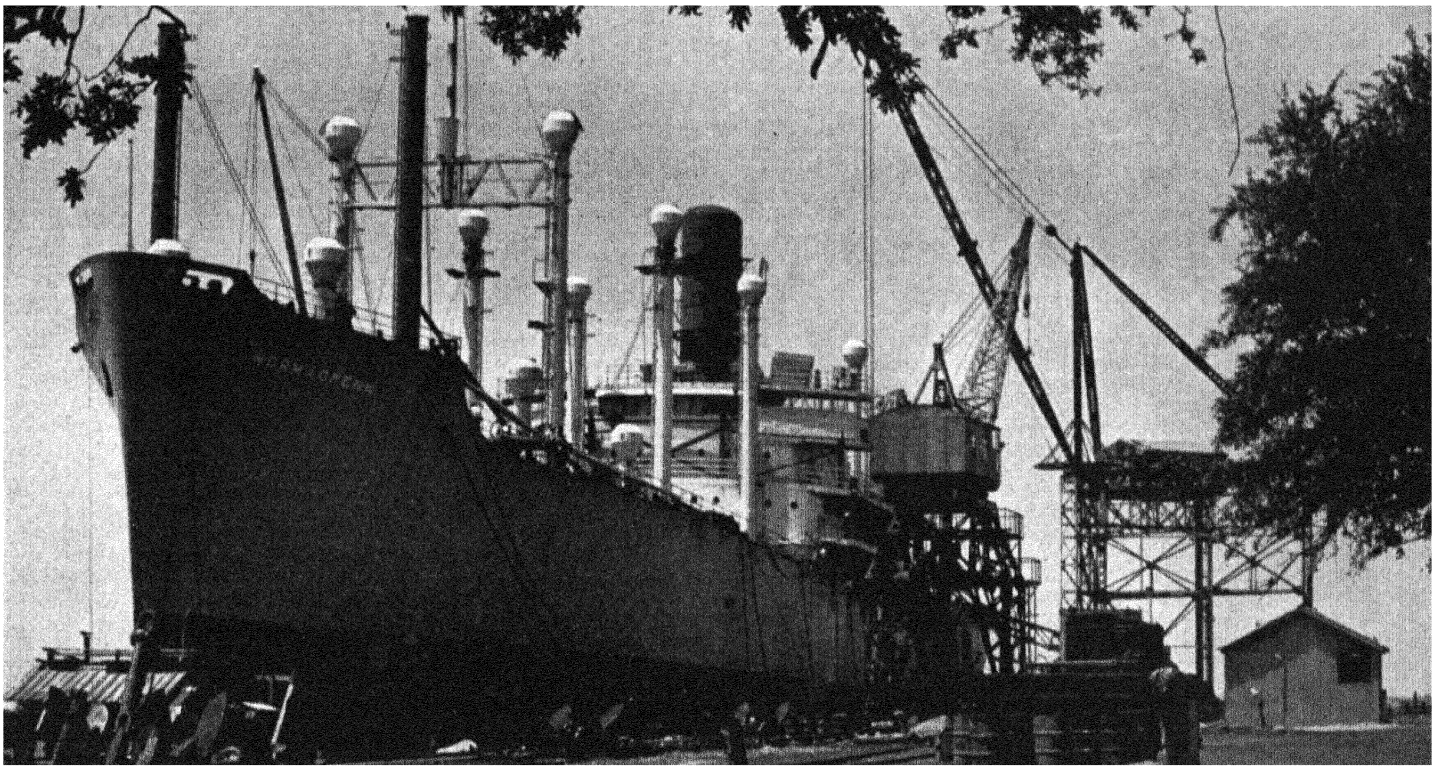
The launchings of merchant vessels reached the approximate rate of one ship a day, and deliveries were expected to reach this rate early in 1942, with two ships a day later in that year. During the first 11 months of 1941 the navy commissioned 27 combatant ships, launched another 41 and laid the keels for 128.

Liberty Ships.—Outstanding events of the year affecting the shipbuilding industry were the enactment of legislation providing funds for the construction of 200 merchant vessels of the so-called "liberty cargo vessels type," the lend-lease program providing for the construction of 112 additional "liberty ships" and 115 of other types and the so-called "all out program" provided for in the Supplementary Deficiency act passed in August, calling for 566 vessels of various types. There were 123 vessels of the "liberty" type to be built on the east coast, 134 on the west coast and 95 on the Gulf coast. In order not to compete with the requirements for labour, material and equipment involved in the Maritime commission's regular program of construction and the expansion of the United States navy, the liberty ships were designed along simple lines adaptable to easy and rapid construction and equipped with reciprocating engines. The 60 ships constructed for British account were coal burners with Scotch boilers, and the 352 for domestic account were oil burners with water-tube boilers.

The principal characteristics of the liberty ships were: length, 441 ft., 6 in.; beam, 56 ft., 10¾ in.; dead-weight tonnage, 10,500; gross tonnage, 7,100. (*See* also SHIPPING, MERCHANT MARINE.)

Navy Department.—Measures taken by the navy department to expedite the completion of combatant vessels and seagoing auxiliary vessels under construction in navy yards and privately owned shipyards commenced to bear fruit during the year 1941. As of Nov. 1, 1941 more than 550,000 tons of naval vessels, exclusive of small craft, were launched. The contract building times on these vessels were reduced from 12 months to 6 months according to the type of ship.

The program of the navy department for the alteration and



THE SLEEPY SOUTHERN TOWN of Pasc[illegible]liss., hummed with activity in 1941 as the first U.S. merchant ships built there took final form. Gulf coast shipbuilding expanded rapidly during the year to meet the demands of national defense and aid to Britain

conversion of commercial vessels and yachts into transports and other naval auxiliaries progressed rapidly, taxing the ship and yacht-repair facilities of the United States. The navy took over 222 commercial vessels, including trawlers and 87 yachts for conversion to navy use.

During the year, the facilities of navy yards and private yards were made available for the repair of damaged British men-of-war. Excellent records for speed were made in connection with this vitally important work. (H. G. S.)

British Empire.—Shipbuilding in 1941 had to be directed solely to fighting the enemy attack on commerce, either by replacements or the construction of men-of-war. The supply of steel, although naturally difficult, proceeded remarkably smoothly. Private contracts continued to be very scarce and practically the whole output was to the order of the British or dominion governments. This made an exact estimate of the increased price of private orders difficult.

In Britain the control continued in the hands of the admiralty as the only party able to balance conflicting demands for labour and material. It was the target of criticism and there were various suggestions of change, from handing the control back to the ministry of war transport to the establishment of an entirely new ministry of merchant ship production. Generally speaking, the difficult work of administration received approval.

The question of reopening the shipyards, closed under the rationalization scheme during the slump, was argued continually, but the authorities refused to lay down a definite policy, considering each case on its merits. Most of these yards, it was pointed out, had been entirely cleared and required new machinery, while there was not enough skilled labour to supply the needs of the establishments at work. Some of the sites appeared to be suitable for fabricating ships from component parts built at a distance.

The fabricated system was arranged on a considerable scale between the shipyards and steelworks on the northeast coast of England as a means of accelerating production. Ferroconcrete shipbuilding was also revived. On a new system, one motorship of about 2,000 tons was built in dry dock on the Mersey and a large number of dumb barges of about 200 tons dead weight were constructed for the admiralty. Welding was being used more and more for minor parts and repairs, but in spite of its advantages in time and weight its use was handicapped by the layout of most existing yards, efficient welding requiring at least 33% more space alongside the slipways.

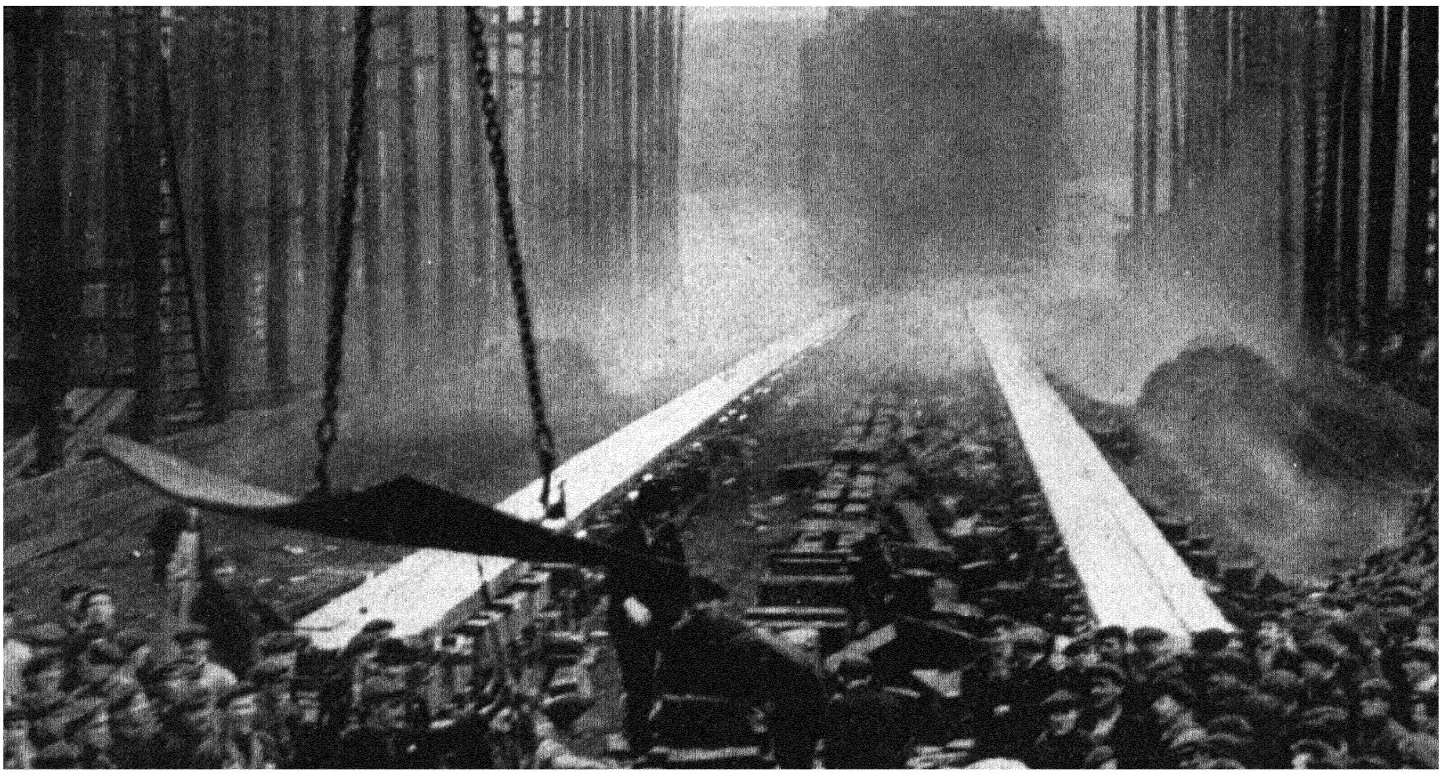
An elaborate plan for saving time by the adoption of the assembly line system was put forward. The ships were to be laid down in dry dock and as soon as the hulls were high enough to float they were to be passed into a canal to be finished in successive berths. The authorities considered that proposal but decided against it.

Although exact details of new merchant ships were withheld, the majority were known to be slow vessels of the tramp type. As more and more ships were lost in slow convoys, a big agitation developed for the construction of faster ships and this continued both inside and outside parliament for the greater part of the year. A number of arguments were put forward for increased speed, irrefutable as an ideal, but there was a significant silence on the part of those accustomed to the operation or production of tramp tonnage.

After so many years of depression the labour problem in Britain naturally continued to be serious, but the general standard was very high and the loyalty of the workers was given high praise. Certain cases of undue zeal by union officials for the retention of peacetime rules attracted attention, but they were exceptional, as was the bad timekeeping in some areas. In the first half of 1941 there were 124 shipbuilding and engineering strikes—the shipbuilding figures were not published separately by the authorities—involving 57,400 workers and wasting 311,000 working days, against 64 strikes involving 16,900 workers and 67,000 days for the same period in 1940. Against this was a very general sacrifice of holidays, etc., by the workers, with a growing conviction that excessive hours were slowing down production through fatigue rather than improving it.

In March the authorities ordered compulsory registration by ex-shipyard workers who had been employed in the industry within 15 years, but most of those who returned had deteriorated greatly in their skill and nerve, and many jobs, especially at a height, were beyond them.

The organization of repair work was greatly improved during



SYMBOLIC OF BRITISH DETERMINATION to maintain their merchant marine was this launching of a freighter in 1941. Before the freighter reached the water, the first plate for a new ship was lowered into place

1941 and the work increased. In addition to numerous cases of direct damage there was a great deal of re-riveting necessary for loosening, owing to near misses by bombs, mines or depth charges. Several examples were related of half ships being salved by the admiralty organization and new bows or sterns built on to them. Only necessary work was undertaken and all owners had orders to get their repairs done abroad whenever possible, the government contributing toward the higher cost. Deferred repairs became a serious matter for both the owners and the underwriters.

On the naval side secrecy was naturally maintained, but much was done to make up for the shortage of small mine sweeping and submarine hunting vessels caused by the French surrender, and the new ships officially mentioned showed that the output of all classes was steady. There were also the alterations and repair jobs inevitable in wartime.

Shipbuilding in the British dominions made very large strides; Australia and Canada showed the most striking results. India made good progress, and the latest suggestion was that South Africa, hitherto interested almost exclusively in repair work, should engage in new construction. In most cases work was started on small craft, principally naval, while facilities for big merchant ships were being built up and it was announced in Sept. 1941 that Australia aimed at the completion of 50 warships, including destroyers, before the end of 1942.

Axis Powers.—The axis powers made the most of the shipbuilding facilities in occupied territories and Vichy France, in spite of the disadvantages of forced labour and the risk of sabotage, but practically no material was allowed for other work. There were many doubtful rumours and propaganda stories of axis activity, but the details were naturally secret. Germany was obviously concentrating on warships and hampered by the bombing of yards, while Italy held up the construction of two badly-needed new battleships for lack of material. In spite of the careful veil of secrecy, it appeared that Japan was greatly hampered by lack of steel and the withdrawal of skilled labour by the services. It was taking twice as long to build an ocean-going ship as it did before the start of the Chinese war, in spite of standardization.

Neutral Countries.—Several neutral countries, which previously imported their tonnage, attempted to establish shipbuilding industries, but it generally proved very difficult on account of the shortage of machinery and labour. Sweden with her own ore supplies was working to capacity with big orders in hand, and Spain made big plans, but progress was slow. (F. C. Bo.)

Shipping, Merchant Marine.

Because of defense requirements, it was difficult in 1941 to make a detailed examination of routing and ship assignments of the United States merchant marine. Repeal of Neutrality act provisions permitted American merchant ships to resume service on combat zone routes, provided for protective arming and allowed the use of U.S. navy escorts.

In 1940 the commission was engaged in its long-range construction program of 500 ships in 10 years (a ship a week). During 1941 its shipbuilding program reached enormous proportions. Superimposed upon the original long-term program of 500 ships in 10 years came an accelerated program to hasten the delivery of those ships, then an emergency program calling for 200 EC-2 or "liberty ships," then the lend-lease program of 227 ships and finally the all-out program provided for in the supplementary deficiency bill of Aug. 1941, calling for an additional 566 vessels of all types. In addition the commission authorized the construction of well over a hundred smaller vessels such as ocean-going and harbour tugs, coastal tankers, coastal cargo vessels, barges, etc. (*See* also SHIPBUILDING.)

These combined programs contemplated a total construction cost in excess of $3,000,000,000 and were expected to bring into service, by the end of 1943, more than 1,200 new cargo ships aggregating over 13,000,000 dead-weight tons. The commission added 993 large vessels to its regular program between Feb. and Sept. 1941. Instead of placing the emergency ship program behind the long-range program, the lend-lease program behind that, and the 566 ships authorized in Aug. 1941 behind the lend-lease, each new expansion was superimposed to some extent upon the others. The combined programs were expected to produce 90 vessels of 1,000,000 dead-weight tons in the first three months of 1942, 146 vessels of 1,400,000 dead-weight tons in the second three months of 1942, 154 vessels of approximately 1,646,000 dead-weight tons in the third quarter and 184 vessels of close to 2,000,000 dead-weight tons in the fourth quarter. In the first quarter of 1943,

220 ships aggregating 2,270,000 dead-weight tons should be placed in operation. The speed of production was set up so as to allow the launching of a ship a day by Dec. 1941 and by July 1942, and thereafter, the completion of two ships a day.

Since the beginning of the Maritime commission's building program in the fall of 1937, and due mainly to wartime defense needs, shipbuilding facilities had grown from ten yards with 46 building ways, capable of handling 400-ft. ships or larger, and engaged in both naval and merchant work, to 40 yards with 275 ways capable of doing the same type of work, of which 29 yards with 202 ways were devoted to the construction of ocean-going merchant vessels.

Because of the rapidity with which new tonnage was placed in commission, 151 ships of approximately 1,300,000 gross tons were turned over to the army and navy. Since 1940, and under the direction of the president, the Maritime commission made available for Great Britain and the other embattled democracies a shipping pool of more than 2,000,000 tons. Another million gross tons of shipping was sold, mostly to the British or for foreign operation.

The Maritime commission used its original 500-ship program to speed up production and thus had a number of modern vessels available when crises developed and defense needs arose. Vessels designed for use as army troop ships and navy transports and supply vessels, as well as others designed for navy aircraft carriers and destroyer tenders, were provided for in the shipbuilding program. In addition to the vessels turned over to the armed forces, other merchant ships were used, as required, to assist in carrying supplies to bases located in the Caribbean sea and in the Atlantic and Pacific oceans.

Preservation of existing oversea trade routes was considered of great importance both as a means of augmenting stock piles of essential raw materials necessary for defense needs and for maintaining the domestic economy of the democratic nations, particularly of the western hemisphere. While routes to continental European and Mediterranean areas were closed for months because of Neutrality act provisions, and transpacific trades somewhat dislocated, others were in full operation, many of them on a greatly expanded basis. For instance, on Jan. 1, 1941, there were 141 ships totalling 832,673 gross tons in service to both coasts of South America, Central America and Mexico, and the West Indies while on Sept. 1, 1941, in the same services there were 209 ships totalling 1,105,284 gross tons.

In order to cope with unexpected emergencies, the Division of Emergency Shipping maintained a "backlog fleet." These were Maritime commission-owned ships, or ships taken over from Denmark in the spring and summer of 1941. This fleet was employed on quick runs to pick up extra defense cargoes whenever ships carrying vital commodities were running behind schedule. For example, a number of these ships were sent down to Chile to bring back copper and nitrates.

The shipping pool ordered by President Roosevelt to relieve the British was augmented by the seizure or purchase of axis-owned and Danish vessels which released 70 ships; American vessels placed on Australian-New Zealand runs released 13 ships and as of Oct. 2, 1941, 79 vessels were placed on runs to the Red sea, releasing an equal number of British ships in that trade. A number of vessels were assigned to carry lend-lease materials to Rangoon, Burma, for transport over the Burma road to the interior of China, and another fleet carried supplies to Russia. Under the "aid to Britain program," prior to Neutrality act repeal, were 40 Norwegian tankers and 23 tankers owned by American oil companies but under Panaman registry.

To facilitate the importation of critical and strategic materials, commercial goods listed as nonessential to the national defense program were moved homeward when, as and if space was available above requirements for essential materials. This procedure enabled American ships to transfer to American soil much of the great backlog of stock piles of strategic raw materials necessary to the defense industry. There was no priority system on outward cargoes and outbound movement of lend-lease materials was controlled largely by the needs of governments to be aided.

Co-operative organization of port facilities in the interest of efficient cargo handling under Maritime commission guidance, resulted in large savings in time and cost of merchant vessels. Quicker turn around sometimes permitted the employment of fewer ships in certain routes. Abroad, in principal ports, the commission maintained expediters and trouble shooters whose duty it was to obtain the best possible service for American ships.

Under lend-lease legislation the commission handled repairs, conversions and defense installations on British and other foreign vessels. Under the Ship Warrants Act of 1941, the commission exercised comprehensive control over emergency shipping activities of both United States and foreign flag vessels trading with the U.S. The commission had authority to supervise rate structures under the Shipping Act of 1916, and also was authorized to provide war risk insurance and reinsurance under certain conditions.

In 1941 about 10,000 licensed officers and 40,000 seamen manned the ships of the American Merchant marine. By 1943 an additional 10,000 officers and 40,000 seamen were expected to be available as new ships were completed. Officers could be obtained from (1) licensed men, either retired or on shore duty, (2) seamen of at least three years' experience qualified to take examinations for licence as junior officers and (3) graduates of the Maritime Commission Cadet Training system or of four state maritime academies. The Maritime commission offered unlicensed seamen a four months' training course to help qualify them to sit for examination. Cadets were required to possess educational and physical qualifications equal to those required to enter the U.S. Naval academy as they become members of the Merchant Marine reserve of the U.S. Naval reserve. They spend three years in training. Four ships owned by the commission were, in 1941, assigned to state maritime academies in California, New York, Massachusetts, and Pennsylvania.

Facilities were available for enrolling 1,000 apprentice seamen monthly for Maritime commission training. Enrollees spend two months ashore and four months at sea in either deck, engine, steward or radio departments. The commission had four shore schools and a training fleet of nine vessels. (*See* also WATERBORNE COMMERCE OF THE UNITED STATES.) (E. S. L.)

Great Britain.—For the year 1941 the major interest in world shipping was the German campaign, the losses which it caused and their replacement. Early in the year it was officially disclosed that the satisfactory situation maintained for the greater part of 1940 no longer existed; losses were exceeding British and American output combined. The weekly British admiralty return was changed to a monthly one in April, partly because of the information that it was giving to the enemy and partly because delayed news and other reasons would often make the figures misleading. After June it was suspended altogether, although it was later officially announced that the losses for July and August had been lighter than for a long time previously.

The situation was eased somewhat by the increased number of Allied merchantmen put on the supply services by the transfer to Britain of more ships built by the U.S. Shipping board during and immediately after World War I, by the transfer of American tankers and other ships under the lend-lease act and by the transfer of a large number of ships from distant services to the

war routes, these ships often being replaced by American vessels.

British owners were very seriously concerned because they were not allowed to replace their war losses by purchasing government-owned ships out of the insurance money that they had drawn. These sales were not to be permitted until after the war, but constant efforts were made to secure a reversal of the policy.

The extent of the help rendered by the merchant ships of Allied flags was shown by the official figures published for July. Down to the end of June, 335 Allied ships of about 1,500,000 tons gross had been sunk by the enemy, but there remained on service 1,617 ships of about 7,250,000 tons gross. The list was headed by Norway with 719 ships of 3,250,000 tons. These consisted very largely of fast motor cargo liners and tankers; only a short time previously it had been stated that a quarter of the goods and half of the oil reaching Britain were carried under the Norwegian flag. Holland supplied 480 ships of 2,250,000 tons, ranging from large passenger liners, some of which were serving as hospital ships and transports, down to the little motor coasters which had reached Britain with thousands of Dutch refugees at the time of the German invasion. The 240 Greek ships, aggregating 1,000,000 tons, were mostly of the tramp type and varied greatly both in age and quality. The Free French contingent numbered 92 ships of 400,000 tons and included a number sailing under the British flag. Belgium supplied 54 ships of 200,000 tons and Poland 32 of 100,000. There were also a number of Yugoslav ships operated in the Allied interest by their national authorities in the United States as well as useful Danish tonnage.

The manning problem, with the large number of casualties and men disabled for long or short periods, was as great as that of material. Various training ships and establishments, evacuated from the most dangerous areas, carried on their work in hulks or premises on shore and there was no lack of keen youngsters volunteering. Under the Military Service act men were given the choice of serving on land, at sea or in the air and the number who chose the sea was greatly in excess of the vacancies in the navy. Arrangements were therefore made to give intensive training for mercantile service in special establishments under the control of royal naval reserve officers with naval petty officers and instructors.

The result was eminently satisfactory; a fine type of man came forward and proved most satisfactory.

The problem with regard to marine engineers and certificated officers was more difficult. Large numbers of trained engineers went back to the sea from shore service, and there was some relaxation in the regulations for sea time in the qualification for officers' certificates, which was found quite possible without any loss of efficiency. In certain instances, officers were permitted to ship in one rank above the certificate which they held (for instance the holder of a first mate's certificate could take command) and this also proved to be safe.

In May the merchant navy pool was instituted from which officers and seamen could be drawn as required in order to prevent delaying the sailing of vessels through local shortage. Under the scheme they sacrificed their choice of ship, which had always been a highly prized privilege, but in return they obtained continuity of employment, longer leave on pay between voyages, pay while they were awaiting appointment and proper relief. All men ashore who had served at sea since Jan. 1, 1936, were required to register in this pool, and after a few initial mistakes which naturally attracted criticism the system settled down to work in a satisfactory manner.

The general standard of the behaviour of the men, both British and Allied, was high and in the majority of cases the greatest gallantry and coolness were shown under fire. There were, however, intensive fifth columnist operations which had some effect among a small minority of seamen who gave trouble with desertion, absence without leave and disobeying instructions. These offences came under the defense regulations which provided more severe punishment than the merchant shipping acts.

Allied countries were given temporary legal powers in British territory under the Allied Powers (Maritime Courts) act passed in May.

Public appreciation of the seamen's services undoubtedly had a great influence on their morale. Suggestions to effect permanent improvements in the lot of the seamen, and to remove acknowledged hardships, were not always happy on account of their advocates' lack of intimate knowledge concerning the conditions and difficulties of the merchant navy, and the constant fear that they were to be used as a steppingstone to nationalization. The most conspicuous of these was in September, when Lords Marchwood and Chatfield in the house of lords, and A. P. Herbert in the house of commons, moved for the appointment of a royal commission to enquire into the employment and conditions of merchant seamen. The suggestion aroused great opposition from practically all parties in the industry, and it was rejected by the government on the ground that the National Maritime board already had full power to arrange the discussion of such matters between the representatives of all parties and that the commission would undermine the work of the board, which was contriving excellent results.

The suggestion of a uniform was also strongly opposed by the unions.

All safety regulations were periodically overhauled and tightened up during 1941. Great attention was paid to life rafts and their launching gear, reducing the chance of their being fouled as they floated off and affording greater support and protection. A number of new patterns were evolved, the Chipchase reversible life raft with sail, etc., being one of the most ingenious and popular. The life boat regulations were improved, providing a better minimum of fittings and a better chance of attracting the attention of rescuers by lamps, scarlet canvas covers, etc. All British ships were made to carry at least one motor life boat, and motor car firms were engaged in the mass production of suitable engines. Further measures for the protection of personnel included the provision of asbestos clothing for the crews of tankers which were particularly liable to fire and the order, in September, for 100,000 "exposure suits" made of strong waterproof material with foot covering and hood, which packed into a small package weighing 2¾ lb. and could be carried by the seamen when at work.

These suits, which were to be provided for every British seaman, greatly reduced the hardships of cold and exposure.

During 1941 there were certain relaxations in the British load line regulations, permitting deeper loading in many cases, but they were very strictly limited by considerations of safety and were not nearly so liberal as the concessions which were made in World War I. Carrying capacity was also increased by closing the tonnage openings of a number of shelter-deck ships, reducing the freeboard demanded for safety, but, unlike the practice of World War I, this did not increase the rates paid by the government.

These rates of hire for requisitioned ships, which had been accepted under protest in the first place, were constantly discussed. A particular point was that requisitioning rates based on the average cost of groups of ships hit the owners of the best and newest tonnage very hard and did not cover interest and depreciation, without reckoning any return on capital. In the coasting tramp trade, which had been under licence and not requisition, there were a number of amendments and concessions by the authorities. Of these the most important was announced

in June, when the government took over the whole liability for war risk insurance premiums on unrequisitioned ships. The controlled rates of freight were reduced accordingly so that there was no direct financial benefit to the owners, but it greatly improved their position for obtaining business in competition with rail and road transport.

In May it was announced that the ministry of shipping and ministry of transport were to be amalgamated under the title of ministry of war transport on account of the many occasions on which the land and sea sides overlapped. F. J. Leathers, well known in the London coal transport trade, was appointed the first minister.

British shipping was further drained by the large scale military operations in the near east, demanding an immense tonnage, and the convoying of practically all merchant shipping with inadequate naval material, which led to increased delays. The speed of convoys was further reduced by deferred repairs and dry docking, while voyages which were prolonged to find the safer routes caused additional delay.

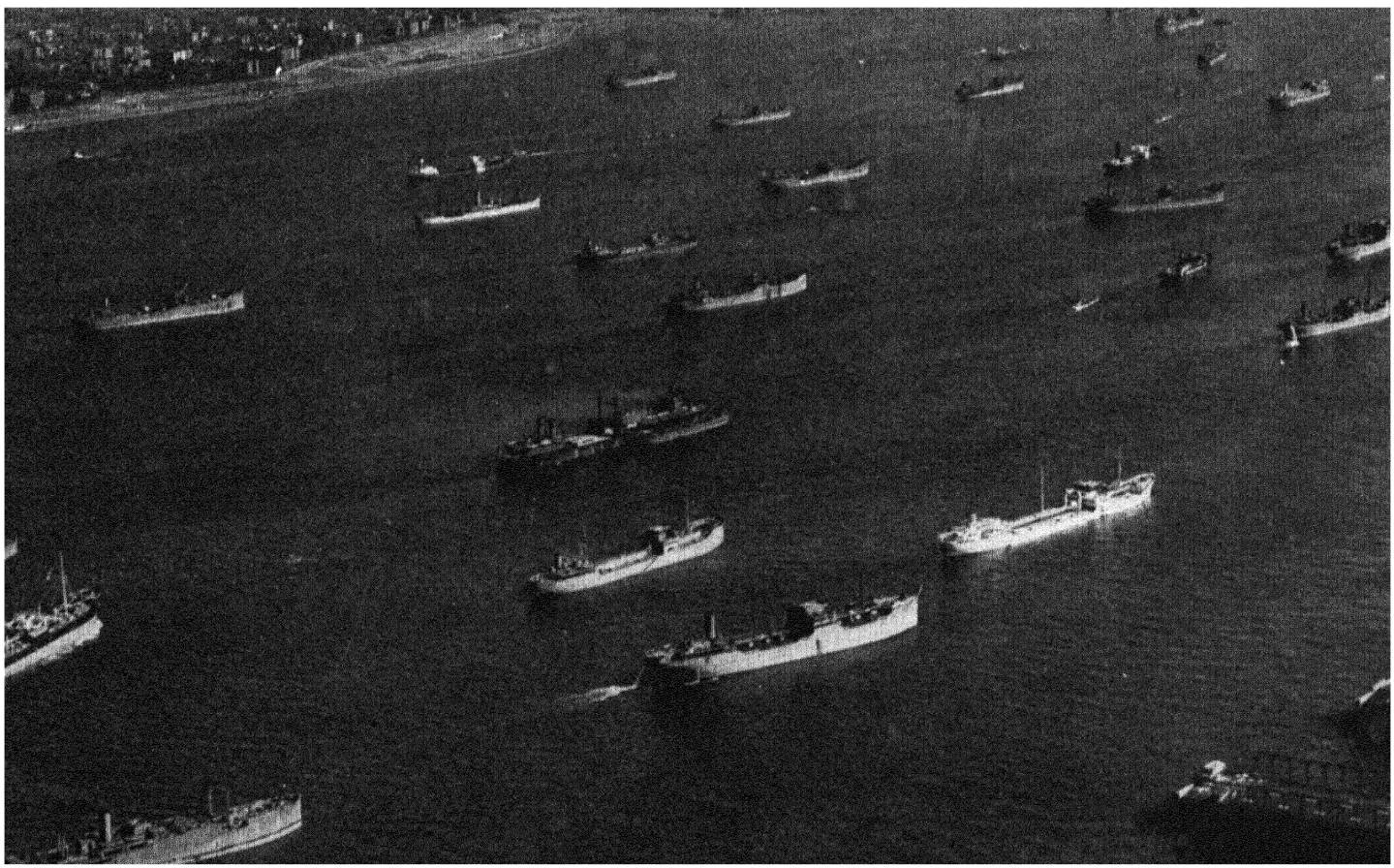
Axis Shipping.—Axis shipping, and the shipping which had fallen into axis hands when various countries were occupied, was employed almost entirely on the coastal supply services, particularly as a result of the congestion of the railways. This shipping suffered very heavily from Allied naval and air attack and, especially in Norway, the strongest measures had to be adopted to force native seamen to handle the ships. Allied shipping losses were so heavy that there was a tendency for many people to lose sight of the fact that the enemy had lost a large number also; in September a conservative estimate was published that Germany had lost 526 ships of more than 2,320,000 tons and Italy 319 ships of more than 1,530,000 tons. Ex-neutral ships lost in axis employ numbered 73 of about 153,000 tons, while 54 refugee ships from occupied countries, totalling about 324,000 tons, had been taken into protective custody.

Neutral Shipping.—In the few remaining neutral countries the prosperity of shipping depended largely on its willingness to enter the danger zone with supplies, and the possibilities of doing so, although the freights on the comparatively safe "cross trades" were high at one time. Proof that a large proportion of the cargoes of Vichy ships, allowed to maintain the supply services, was going through to Germany led to the withdrawal of navicerts in May. Several countries attempted to build up or to conserve merchant shipping for their own purposes; Argentina was allowed to purchase refugee Italian ships under conditions, principally that Italy should not receive the money until after the war; while Brazil barred her ships from entering the danger zone in September, this zone including the east coast of South America below Bahia Blanca, which caused considerable comment. The greater part of Swedish shipping in home waters was placed on the German supply services, but the rates of hire were unsatisfactory until the middle of the year. Eire and Switzerland purchased a number of neutral ships for the essential supply services, but they had to pay very high prices for them. Japanese shipping was greatly handicapped by the colossal requirements of the services for the campaign in China, the rigid control imposed by the government and difficulties of exchange; trade opportunities were further reduced by the boycotts imposed by the Allies and the United States after the occupation of Indo-China. Running expenses rose rapidly all over the world, and in most countries opportunities for profit were restricted by government control. (F. C. Bo.)

Shock Treatment: *see* PSYCHIATRY; MEDICINE.

Shoe Industry. Leather was in 1941 listed as no. 7 in war essentials. Its world-wide status was important as a needed supply, limited to the production of meat, of which it is a by-product. The shoe industry of the United States went on a war footing in 1941. It had to depend upon itself for 80% of its leather for footwear and other uses. Most

THE LARGEST MERCHANT FLEET to enter New York harbour since the start of war—114 British, Norwegian, Dutch and Icelandic ships—arrived within a space of 42 hours, Sept. 14-16, 1941



Comparative Statistics of U.S. Shoemaking, 1940 and 1941

Year	Women's	Men's	Misses' and Children's	Youths' and Boys'	Infants'	All Other	Total
Production of Shoes by Major Types (000's omitted)							
1940	167,504	102,700	40,750	15,276	21,750	56,171	404,151
1941*	193,500	118,000	48,000	19,000	27,500	79,500	500,000†
Estimated Consumption of Shoes by Major Types (000's omitted)							
1940	176,202	102,820	42,109	16,013	22,919	55,556	415,619
1941*	184,000	109,000	45,900	17,600	24,500	63,000	444,000
Per Capita Production of Shoes by Major Types (Pairs per capita)							
1940	3.40	2.08	3.21	1.17	2.63	0.43	3.06
1941*	3.90	2.37	3.72	1.46	3.28	0.00	3.77†
Estimated per Capita Consumption of Shoes by Major Types (Pairs per capita)							
1940	3.58	2.08	3.32	1.23	2.68	0.42	3.15
1941*	3.71	2.21	3.64	1.37	2.89	0.48	3.34

*Preliminary.
†Includes shoes for defense.

sea lanes were closed to European and Asiatic hide and skin resources. Sharply curtailed civilian production throughout Europe, Canada and Australia and "war spots" throughout the world made necessary the conservation of war leathers and some restraint on their use in the civilian economy. No limitation was placed upon civilian footwear or leather use in the United States in 1941.

U.S. Shoemaking.—U.S. shoemaking increased in 1941 to an all-high total of 500,000,000 pairs (not including rubber footwear). U.S. soldier footwear, manufactured to the total of 16,000,000 pairs in 1941, was expected to be doubled in 1942. Additional demands for Allied nations' war needs were expected to increase war shoemaking to 50,000,000 pairs. Russian war shoe orders were in production. A complete withdrawal of war leather in the weights, substances and standards needed by the army and navy was expected.

Utilization of a wide diversity of skins and hides in the lighter weights continued to maintain civilian production in the United States at a high total. Feminine footwear the world over had to adapt itself to national supply in each land and reached the point in Europe, Africa and Asia where wooden soles, remnants of automobile tires, etc., replaced both leather and rubber.

Styling did not materially decrease because colour, design and pattern play a part in "lifting the spirits" of civilians.

The rise in price of shoes was retarded in all lands by either price ceilings or coupon rationing; and in the United States by voluntary restraint on the part of manufacturers and dealers. Shoes were classified as the "poor man's index" because they are in common use by men, women and children and subject to public price opinion.

World Export.—Foreign export was in a confusing situation. Trade intercourse between the United States and South America was of a two-way character—leather supplies and finished shoes in free distribution, with practically no sea lane interference. England maintained her quality shoe export. The impounded nations in Europe had to trade within themselves in shoes and leather. Lend-lease exports of shoes for war and civilian use were almost negative in 1941 but were expected to expand greatly in 1942 between the United States and Allied nations.

U.S. government licences and ceilings operated successfully on the major intake of hides and skins and the domestic sale and supply of finished leathers.

Rubber Footwear.—The highest record of rubber footwear production prevailed in the United States in 1941. Because of the shortage of aluminum moulds and vulcanizing equipment for the making of men's heavy boots and galoshes, the rubber industry went on 24-hour production schedules—the major output of which was restricted to army use. Civilian sandals, galoshes and rubber novelties continued at a high rate of production until the outbreak of the U.S.-Japanese war, when all rubber was impounded, subject to government allocation. There was no expectation of a release of any great quantity of rubber and latex in 1942. Women's fashion footwear, to the extent of one-third the total production, was made with rubber backing cloth to give elasticity and flexibility. This market was severely curtailed at the end of 1941 because of the lack of liquid latex for yarn making.

The civilian rubberized footwear industry continued to distribute its finished product at retail from inventory in plant and stores and there was no expectation of improvement in the making and supply of civilian rubber footwear unless conditions improved in the far east.

Rubber was the first war victim in the shoe industry's casualty list. (*See* also LEATHER.) (A. D. AN.)

Short, Walter Campbell (1880–), U.S. army officer, was born March 30 in Fillmore, Ill. A graduate of the University of Illinois, he entered the army in 1902 as an infantry lieutenant and saw service in the Philippines, 1908, and in the Mexican punitive expedition, 1916. During World War I he was attached to the 1st division general staff and was assistant chief of staff of the 3rd army. He was made a brigadier general in 1936, and was given command of the 1st division, Fort Hamilton, N.Y., 1939. In 1940 he was appointed major general and commanded successively the 4th and 1st army corps. He was made commanding general of the Hawaiian department Feb. 8, 1941, but was relieved of this post Dec. 17, 1941, in the army shakeup that followed the Japanese blitz on Pearl Harbor.

Shows. Horses.—The American Horse Shows association's rule book for 1941 listed 171 horse shows held that year under auspices of the association. Of these, 133 were sponsored by member organizations, and 38 were nonmember shows licensed by the association. The list did not, however, include hundreds of shows held in smaller communities or in connection with hundreds of county fairs. The only apparent effect of war on horse shows was that British, Canadian, Mexican and other army teams were absent from the picturesque National Horse show which held its 58th annual exhibition in Madison Square Garden, New York city, Oct. 5 to 12, 1941. United States, Cuban and Peruvian army teams participated in the New York show. The U.S. team won the International Military Special Perpetual Challenge trophy. United States army teams also appeared in a number of army and civilian horse shows throughout that country. Sensation, owned by Mrs. Reed Albee, Larchmont, N.Y., attracted outstanding attention at both the New York show and at the International Livestock Exposition and Horse show, Chicago, Ill., Nov. 29 to Dec. 6, 1941, taking first honours in the world's champion five-gaited $2,500 stake at Chicago and in the five-gaited class in New York city. In both shows E. F. Luckenbach's Lucky Jacqueline gave strong competition. Man of Destiny, owned by J. T. Russell and undefeated stallion champion of the year, won the $500 stallion stake in the Chicago show. Judy Dare, owned by Herbert Herff of Memphis, Tenn., was one of the leading favourites with spectators at the New York and Chicago shows, and also at the annual American Royal show in Kansas City, which had a record in both attendance and in the number of entries. The novel event of 1941, however, was the show held in San Francisco's huge new arena called the "Cow Palace," where the attendance was 142,000

MY OWN BRUCIE, a black cocker spaniel, was selected champion of 2,547 entries of all breeds in the Westminster Kennel club show in New York city Feb. 12, 1941, for the second successive year

although the show had only six weeks' previous notice. Most of the larger shows had unusually large classes in all divisions, and there was a prevalent tendency to increase the number of events open to women and juniors. (S. O. R.)

Dogs.—In 1941, 91,000 dogs, owned by 30,000 exhibitors, presented themselves for judging according to breed standard (physical type) at 232 all-breed and 115 one-breed shows. These figures were the largest since the first dog show was held in America in 1874. An orange-belton English setter Ch. Maro of Maridor won most best-in-shows, fourteen.

The cocker spaniel led in number of show entries (also stud book registrations). Obedience training classes and children's handling classes became increasingly popular as phases of dog show activities.

Morris and Essex Kennel club again held the world's largest dog show, at Madison, N.J. with judging in the open (3,883 dogs entered), 58 rings being used simultaneously, a one-day show. The Los Angeles Kennel club in November held the largest Pacific coast show, 1,002 dogs entered. Largest southern show, Birmingham, Ala., 530 dogs. Largest midwest show, Chicago, Ill., 1,227 dogs. (W. Ju.)

Livestock.—Annually beginning the calendar year of livestock shows and fairs in the U.S. is the National Western Stock show at Denver, Colo., which was held in its 35th renewal Jan. 11 to 18, 1941.

The Denver show is noted for its huge exhibits of range-bred feeder cattle and of purebred beef bulls and is a famous source of supply for quality bulls needed for range service and for choice young beef cattle for Corn Belt feedlots.

March 7 to 16 marked the 45th anniversary of the Southwestern exposition and Fat Stock show at Fort Worth, Tex. This show is the leading livestock exposition of the southwest and is the oldest livestock show in the country.

No important livestock shows or fairs occur in the United States from spring until the late summer. Beginning in August, these state shows are staged weekly through October, arranged by circuits in various sections of the country, to enable exhibitors to travel to a series of fairs over a period of a month to six weeks.

Most important of the nation's state fairs in 1941, in terms of livestock and allied agricultural exhibits, were those of Illinois, Indiana, Iowa and Ohio, all of which were held in August. The Ohio state fair at Columbus, Aug. 23 to 29, was distinguished by the largest exhibition of sheep at any show in the country during 1941.

The National Percheron Draft Horse show was held coincident with the Minnesota state fair at St. Paul, Aug. 23 to Sept. 1; and the Waterloo Dairy Cattle congress at Waterloo, Ia., Sept. 29 to Oct. 5, combined the year's major showing of the dairy breeds with the National Belgian Draft Horse show.

Important fairs, with emphasis on exhibitions of dairy cattle, were the Wisconsin state fair at Milwaukee, Aug. 16 to 24; the New York state fair at Syracuse, Aug. 24 to Sept. 1; and the Illinois state fair, Springfield, Aug. 9 to 17, the latter also ranking as one of the country's largest shows of beef cattle, horses, sheep and swine.

The National Dairy show, founded in Chicago, Ill., in 1906 and itinerant after 1920 was staged in Memphis, Tenn., Oct. 11 to 18, 1941 in connection with the Mid-South fair.

Ranking first among eastern sectional shows was the annual Eastern States exposition, which was held Sept. 14 to 20 in Springfield, Mass. This show emphasizes exhibitions of both dairy and beef breeds from eastern herds. A similar exposition of equal importance on the west coast is the Pacific International Livestock exposition at Portland, Ore., which took place Oct. 4 to 11, 1941. The Eastern States show has been held annually since 1917, the Pacific International since 1911.

The Ak-Sar-Ben Stock show in Omaha, Neb., Oct. 5 to 11, and the American Royal Livestock show in Kansas City, Mo., Oct. 18 to 25, were sectional shows of national importance, with special emphasis on exhibition of the beef cattle breeds. The American Royal Horse show is one of the country's best and largest.

In its perennial calendar position at the close of the year's agricultural expositions and fairs, the International Livestock exposition, held annually in Chicago since the turn of the century

during the first week of December, has, since its inception, been the country's largest and most important annual livestock and agricultural show.

Under world conditions in 1941, the 42nd International show at Chicago, Nov. 29 to Dec. 6, was not only the largest show of its kind in the United States, with an entry of 13,149 farm animals, but it also took world precedence in this respect. Every state in the union and five Canadian provinces were represented by participants. The world's largest farm crops show, the International Grain and Hay show, was staged in its 23rd year as a department of this exposition.

Canada.—Canadian war activities curtailed somewhat the dominion agricultural shows. However, the three famous summer shows of Canada, the Calgary exhibition, the Edmonton exhibition, and the Canadian National exhibition all took place in 1941. The largest, the Canadian National, founded in 1879, was held in Toronto, Ont., Aug. 22 to Sept. 6.

Great Britain.—After 108 years of continuous progress, the famous Highland Agricultural show of Scotland has not been held since 1939, due to the war; and the Royal Agricultural show of England, after 98 years, was discontinued in 1940 and 1941 for the same reason.

South America.—The chief South American agricultural show, the Palermo, was renewed in Buenos Aires on Aug. 15, 1941. A ten-day show, the first four days were devoted to judging, while the general public was excluded. During the remaining week, the public was admitted to view the prize-winning livestock displays. The Palermo has the world's largest annual showing of Shorthorn cattle and is noted for large exhibitions of Aberdeen Angus and Hereford cattle, as well as sheep. Although they are included, less emphasis is placed on the exhibition of Holstein-Friesians and Guernseys, the major dairy breeds of the Argentine.

(W. E. O.)

Siam: *see* THAILAND.

Siemens, Carl Friedrich von (1872–1941), German industrialist and munitions maker, was born Sept. 5 in Charlottenburg, Germany, the youngest of four brothers all prominent in British and German industry. His father, Werner Siemens, founded the vast Siemens works, which produced electrical machinery and armaments. Educated at the University of Strassburg, Carl Friedrich joined the family firm in 1899 and managed a London subsidiary from 1902 to 1908. He then returned to Berlin to become chairman of the Siemens Schuckertwerke. In 1919 he became chairman of the supervisory board of Siemens & Halske, an offshoot of the parent firm and the Siemens Schuckertwerke. In the postwar years the plant expanded enormously, and the Siemensstadt area in Greater Berlin was a target for R.A.F. bombers in World War II. He was a member of the reichstag, 1920–24. A Berlin dispatch of July 10 reported his death.

Sierra Leone: *see* BRITISH WEST AFRICA.

Silicosis is the most important chronic pulmonary condition due to inhaled dust. Years of exposure to high concentrations of fine, free silica dust (quartz) in mines, potteries, etc., produce small nodules of scar tissue throughout the lungs. In the absence of infection their uniformity of size and distribution produces diagnostically significant shadow patterns on an X-ray film. The cardinal symptom is exertion dyspnoea, often too slight to interfere with customary work. A specific susceptibility to tuberculosis is created which in healed or active phases increases disability. Toxic symptoms and tubercle bacilli in the sputum may not appear for years.

Silica irritation is chemical and not abrasive, so that emery and carborundum, for example, are not injurious. Quartz particles can be neutralized by coating them with insoluble substances, either mechanically by prolonged grinding with soft iron or gypsum or chemically with compounds of aluminum.

Attempts were being made in 1941 in Ontario and the U.S. to prevent silicosis by mixing metallic aluminum with the quartz in the air. Control of the dust at its source remained the best prophylaxis.

Asbestosis.—Most silicates are harmless but the fibrous varieties known as asbestos produce another dust disease called *asbestosis*. Diffuse fibrosis, associated chronic pleurisy and emphysema cause marked disability. Tuberculous complications are less frequent and tend to heal but produce excessive scar formation with increased dyspnoea. Very short asbestos fibres are less irritating to animals' lungs, suggesting a mechanical injury. In animals asbestosis retrogresses on cessation of exposure. Certain forms of talc have come under suspicion as a cause of disabling pneumoconiosis.

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Silk. At the end of 1941, a silk dress, silk hosiery or any other article of silk, so far as the United States and other allied countries were concerned, had become a rarity to be treasured. The shifts of international dissension terminated the slowly dwindling use of silk that had been developing since 1932. When relationships that were strained by July 1941 became totally broken off on Dec. 7, Japan, as the chief supplier of the world's raw silk and as the conqueror of the eastern coast of China, the second largest supplier, made silk enemy material to the millions of Americans who had accepted silk as an everyday textile fibre.

On July 26, 1941 the United States government issued an order that no processing of silk would be permitted except for government use. One of the immediate effects of the order was the dislocation of the vast silk hosiery industry in the United States which at the time was supplying hosiery for that part of the world still in free trade.

Exports of hosiery to South America had been assuming large proportions when the makers found themselves deprived overnight of their raw material. All silk in the manufacturing plants or in warehouses was confiscated by the government for use in parachutes primarily, although so-called powder-bag cloth, for holding the charges of powder put into big gun shells, also demanded pure silk. This was waste silk, however, and not the type of silk (raw silk) used by hosiery mills. The government bought the silk from private owners at a stipulated price, as fixed by the Office of Price Administration, and resold it to mills making defense materials. The base price was $3.08 a pound for 78% Japan 13/15 white.

Previous to the action of the Price Administration early in August, the price had risen from $3.00 in June to $3.18 in July. There was no defense material that would employ the knitting machinery for making women's full-fashioned hosiery so that the actual effect of the ruling was to force every hosiery manufacturer to deliver his holdings to the government for use of the

Monthly Deliveries of Raw Silk to U. S. Mills, 1941

Month	Lb.	Month	Lb.
January	24,630	July	27,325
February	26,040	August	1,956
March	24,187	September	4,490
April	22,688	October	4,160
May	21,650	November	5,676
June	23,686	December	Not known

weavers of silk defense fabrics.

A picture of what happened to the industry is seen in the accompanying table of monthly deliveries of raw silk to United States mills during 1941.

The large shipments in July reflect the sudden effort of mills to gain possession of silk that was on order or held in warehouses for their account before the threatened import stoppage. The subsequent shipments of silk were to mills holding government contracts. The amount of silk on hand Aug. 1, from an inventory of warehouses of importers and of mills, was not divulged because it was considered confidential military information.

Many of the uses of silk that had continued despite the great use of rayon in dress fabrics were disclosed with this situation. Silk coverings for insulating wires, silk for cloth used by millers to sift flour, called bolting cloth, silk for shower curtains, umbrellas, raincoats, etc., silk for making the screens used in screen printing of textiles, silk for making fine cutout embroideries, where the design was stitched with cotton thread on a pure silk foundation and the effect of cutout embroidery given by dissolving the silk with an acid that did not affect the cotton—all these and many more were thrown into confusion with the sudden development. Some turned to rayon threads satisfactorily. The flour millers had a sufficient stock of bolting cloth on hand to last for some months and expected to use the stronger synthetic fibres such as nylon, vinyon, etc., when their stock of bolting cloth was gone. Others were conducting experiments to determine what they might use. (*See* also RAYON.)

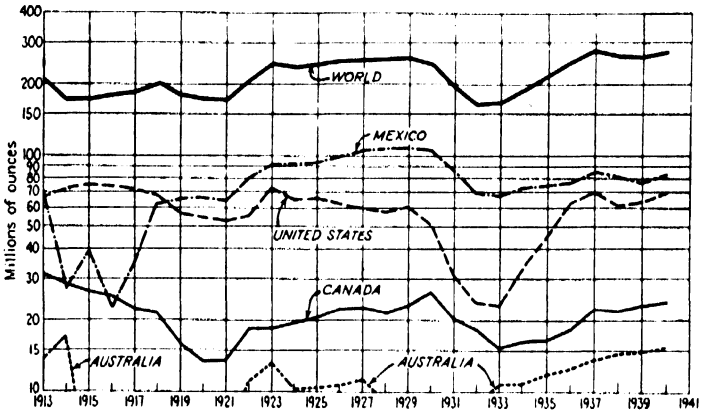
The year closed with silk, in the Allied countries, a defense material, and in most of the other countries of the world an already forgotten product. But in the United States representations were being made to the government, through the department of agriculture, to investigate the possibilities of producing raw silk commercially in the western hemisphere. The fascination of sericulture had resulted in many attempts for 300 years to make silk a profitable crop in the U.S. or in Central or South America. Mulberry trees had flourished and the finest cocoons had been produced, but the movements met defeat in producing sufficient quantities of the reeled threads from the cocoons to make the venture successful in the commercial market. This was more true as the synthetic fibres were developed. (*See* also TEXTILE INDUSTRY.) (I. L. BL.)

Silver. World production of silver increased by 6% in 1940, to a total estimated at 273,700,000 oz. The trend of output is shown in the accompanying graph, and distribution of output in the accompanying table.

World Production of Silver
(In millions of fine ounces)

	1929	1937	1938	1939	1940
Canada	23.1	23.0	22.2	23.1	23.8
United States	60.3	69.3	58.7	57.8	67.0
Mexico	108.7	84.7	81.0	75.9	82.6
Other N. America	2.8	5.1	5.9	6.0	6.0
Peru	21.5	17.2	20.5	18.8	19.0
Bolivia	6.2	9.5	6.4	7.2	5.6
Other S. America	1.7	6.1	5.5	5.5	5.4
Germany	5.5	6.8	7.0	7.0	
U.S.S.R.	0.4	5.0	7.0	7.0	22.0
Other Europe	5.5	8.2	8.2	7.8	
Japan	5.2	10.0	10.0	11.0	
India	7.3	6.9	6.5	6.8	22.0
Other Asia	2.3	3.8	4.3	4.6	
Africa	1.3	5.3	5.7	4.6	4.6
Oceania	9.9	14.8	15.1	15.5	15.6
Total	261.5	275.1	264.1	258.8	273.7

Production in the United States amounted to 67,013,000 oz. in 1940. The output during the first ten months of 1941 was 58,836,000 oz., an average rate equivalent to 70,600,000 oz. for the year. The total for the first seven months in Mexico was 48,591,000 oz., as compared with 47,768,000 oz. in the same period of 1940. In Canada operations for the first three-quarters of 1941 gave a total of 16,940,012 oz., against 19,273,224 oz. in the same period of 1940. No 1941 data were received from other sources.



SILVER PRODUCTION: world total and output of the major producing countries, as compiled by *The Mineral Industry*

The first change in the price of foreign silver on the New York market in more than a year was made on Nov. 28, 1941, when the quotation was raised from 34·75 cents per ounce to 35·125 cents. On Nov. 19 the government of the United States concluded an agreement with that of Mexico, covering the buying of Mexican silver at 35 cents, as against the current open market price of 34·75 cents. This resulted in so much of the silver going to the government that there was an insufficient supply in the open market until the price was raised. The government buying price for newly mined domestic silver was unchanged throughout the year at 71·11 cents. The London market opened at 23¼*d.*, and closed at 23½*d.*, with only minor changes during the year. (*See* also MINERAL AND METAL PRICES AND PRODUCTION.)

(G. A. RO.)

Simovitch, Dushan (1882–), Yugoslav statesman, was born in Kragujevac, Serbia. In 1900 he graduated as an honour student from the military academy at Belgrade with the rank of artillery lieutenant. During World War I he was a major on the general staff. After the war he was successively delegate in the national council at Zagreb, adjutant to the commander of the 4th army and adjutant to the king. From 1919 to 1927 he was chief of staff of the 3rd and 4th armies. In 1930 he served as commandant of the military district for Bosnia, then was transferred to take charge of the army mechanized instruction schools in Sarajevo. In 1938 he was appointed commanding general of the Yugoslav air force. On March 27, 1941 he engineered the coup d'état which led to the overthrow of Premier Cvetkovitch's government, under Regent Prince Paul, three days after it had signed a pact with the German-Italian axis. The new government repudiated the axis pact and proclaimed young Peter II as king, with Simovitch as premier. Upon Yugoslavia's speedy defeat by German arms (April 6–18, 1941) Simovitch fled with Peter II to Jerusalem. In June the two arrived in London to set up their government in exile. (*See* also YUGOSLAVIA.)

Singapore. Capital of the Straits Settlements (*q.v.*) and the main port of southeastern Asia, located at the intersection of the trade routes to Australia and to India and Europe, Singapore is on an island of the same name, 27 mi. long and 14 mi. broad, off the southern tip of the Malay peninsula. It is situated at 1° 20′ N. The population of Singapore Island (1940) was 750,805. Chinese, Hindus and Malays are the principal elements in a very mixed cosmopolitan population.

Singapore was chosen as the site of the largest British naval base east of Suez and was built over a period of years at a cost of about £7,700,000 sterling, not including the expenditures on the land and air forces stationed there. Conspicuous features of the base, which is located on the northern shore of the island, on the Strait of Johore (a causeway connects the island with the mainland), were the huge dry and floating docks, which could service the largest types of warship. There were also extensive naval repair shops and oil storage facilities. The British forces in Singapore were several times reinforced by Australian and other troops as tension with Japan became marked during 1941. The great base was the main objective of the Japanese overland drive down the Malay peninsula in Dec. 1941. (*See* also JAPAN; WORLD WAR II.) (W. H. CH.)

Sin Kiang (CHINESE TURKESTAN). Bounded on the north and west by the soviet union, by Mongolia on the north, on the south by India and Tibet and on the east by China, Sin Kiang is one of the largest, most remote, isolated and little known regions of China. The name means New Dominion, and it is not an integral part of China, from which it is separated by mountain ranges and deserts, although there is a seat of Chinese administration at Urumtsi. Area, 705,769 sq.mi.; pop. (est. by Chinese ministry of the interior, 1936) 4,360,020. Especially in the southern part of the territory, the population consists largely of Turki tribes, mostly of the Moslem faith, who have carried on sporadic rebellion against the Chinese authorities in Urumtsi. The largest towns are Urumtsi (50,000) in the north, and Kashgar (80,000) and Yarkand (75,000) in the south. Much of Sin Kiang is desert country; but cereals, fruits and vegetables are cultivated in the valleys of the Yarkand and Kashgar rivers, and irrigation has been known in this part of the world since ancient times. Cotton, wool and silk are other products. The trade of Sin Kiang tends to gravitate to the soviet union, especially since the opening in 1930 of the Turkestan-Siberia railway, which passes close to the border in several places. There is substantial soviet political influence in the region, and foreign travellers enter the territory at some risk if they do not possess soviet permission. The degree of domination by the soviet representatives is less than in Outer Mongolia, but it takes the form of giving military and technical advice. Soviet trucks, proceeding over an old caravan trail from Urumtsi, have transported considerable quantities of munitions and supplies to China. The air route from Chungking to Moscow also lies across Sin Kiang, with stops at Urumtsi and at Hami on the eastern border of Chinese Turkestan. There is an old inn at Hami where the famous mediaeval traveller, Marco Polo, once stopped. (W. H. CH.)

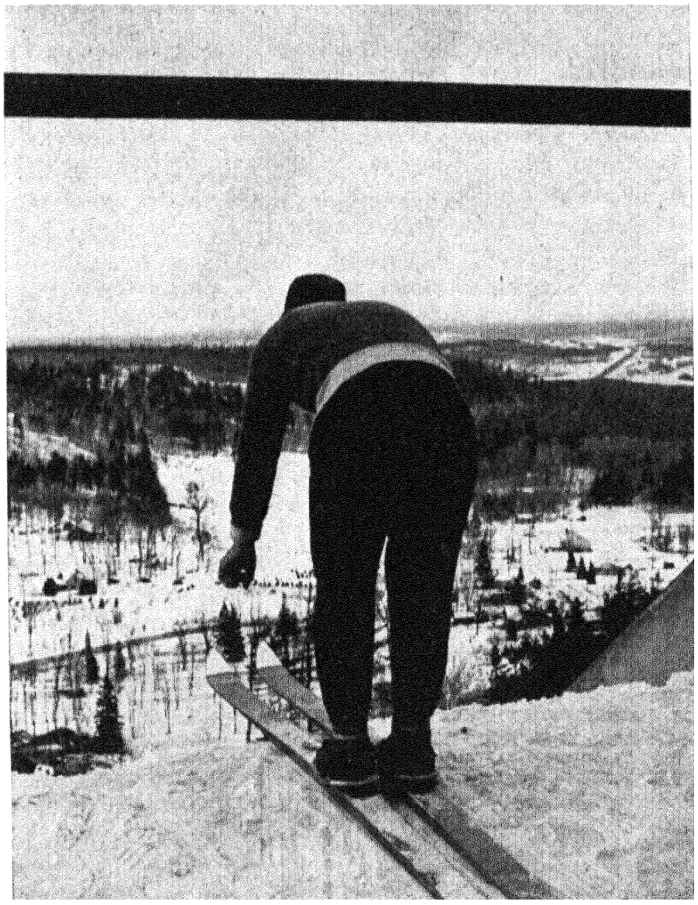
Sino-Japanese War: *see* CHINESE-JAPANESE WAR; FOREIGN MISSIONS.

Sister Kenny Treatment: *see* INFANTILE PARALYSIS.

Skating: *see* ICE SKATING.

Skiing. As general enthusiasm for skiing developed in 1941, hundreds of ski clubs were established in cities and towns in all parts of Canada and in the states along the northern boundary of the United States. The Toronto Ski club had in 1941 a membership of more than 5,000 men and women. There are excellent ski runs near all the large cities and in the national parks, in settings of superb scenic beauty, from Quebec to the steep slopes of Washington.

Millions of skiers and skiing enthusiasts shared in the daring exploits of several sensational young men, led by Torger Tokle, the young Norwegian who thrilled thousands of spectators on



TORGER TOKLE, U.S. champion ski-jumper, preparing to take off at a meet in Duluth, Minn.

Olympian hill, near Seattle, Wash., when he soared 288 feet to top the national record of 273 feet he had set a short time before at Leavenworth, Wash. He also broke distance ski marks on ski runs at Lake Placid, Bear mountain, Duluth and Laconia-Gilford. Besides taking the national and central titles, he won the eastern crown for three successive years. Alf Engen, of Salt Lake City, dethroned by Tokle, leaped 267 feet off the huge Pine mountain slide and won the national classic combined in Michigan. Toni Matt, professional, won the national downhill and combined downhill-slalom in the open divisions, defeating the defending champion, Dick Durrance, the famous Dartmouth alumnus, who in turn took the national open slalom. Young Bill Redlin, of the University of Washington, won the amateur laurels in the downhill, slalom and combined events at Aspen, Colo. George Gustavson, of Auburn, Calif., returned as the national cross-country ruler. Dartmouth retained the collegiate Ski union title, but lost the 31st annual Dartmouth carnival to the University of New Hampshire team.

Among women skiers Mrs. Gretchen Fraser of the Sun Valley Ski club dominated the championships. In the open class she won the national downhill and combined downhill-slalom. Miss Nancy Reynolds, of Montclair, N.J., won two amateur titles, the national downhill and combined national championships. Miss Marilyn Shaw won both the open and amateur slalom titles with fine form. (J. B. P.)

Skin Diseases: *see* DERMATOLOGY.

Slate. The United States, United Kingdom, France and Germany accounted for about 90% of the world's slate production, and the soviet union, India, Belgium, Sweden, Australia and Canada for most of the remainder. The only 1940 data available were those of the United States, where production was 473,450 short tons, a decline of nearly 10% from 1939. (G. A. RO.)

Slovakia. A nominally independent republic in Central Europe, formerly a part of Czechoslovakia. Area 14,848 sq.mi.; pop. 2,800,000, of whom the great majority are Slovaks, a Slav people closely akin racially and linguistically to the Czechs. The majority are Roman Catholics, but there is a considerable Protestant minority. Capital, Bratislava; chief cities: Bratislava (123,852); Trnava (23,971); Nitra (21,259). President, Msgr. Joseph Tiso; premier, Dr. Bela Tuka.

Slovakia came into existence in March 1939 through German help. It signed a treaty with Germany according to which armed forces received the right to occupy Slovakia at any time and to erect military plants there. Slovakia pledged herself to conduct her foreign policy and to organize her army in agreement with Germany. All her economic life was strictly co-ordinated with national socialist economy. On Nov. 24, 1940, Slovakia adhered officially to the Rome-Berlin-Tokyo military alliance. As a result of that pact, Slovakia participated in Germany's war against the soviet union after June 22, 1941, and declared herself to be in a state of war with the United States after Germany's similar declaration of war Dec. 11, 1941. But Slovakia's relations with her axis partner Hungary remained extremely strained in view of the fact that Hungary had annexed much Slovakian territory and was believed to covet all of Slovakia, which before 1918 had formed part of Hungary.

Many of the leading Slovaks, dissatisfied with the German vassalage, with the fascist trend and with the anti-Slav stand taken by the Slovak government, worked for the re-establishment of the Czechoslovak republic. A number of Slovaks participated in the Czechoslovak government which resided in England under Dr. Eduard Beneš as president.

Industry and Trade.—Slovakia is a country rich in timber, wheat, ore and sugar beet and has developed industries working these raw materials. The exports amounted in 1940 to 3,175,000,000 Slovak crowns, the imports to 2,872,000,000. Germany participated in the exports with 69·7%, in the imports with 76·5%, Italy occupying second place, with 5·9% of the exports and 4·5% of the imports. Among Slovakian exports timber and wood ranked first followed by matches, iron and paper. Among the imports, textiles were followed by metal and metal goods, food and tobacco and machines and tools. (*See* also BOHEMIA AND MORAVIA; CZECHOSLOVAKIA; RUTHENIA.) (H. Ko.)

Small Business: *see* BUSINESS REVIEW: *Industrial Groups.*

Smith College. A college for women located at Northampton, Mass. Hallie Flanagan Davis, professor of drama at Vassar college and former director of the federal theatre project, was appointed dean of Smith college and professor of drama in 1941 to succeed Marjorie Hope Nicolson, who joined the faculty of the graduate school of Columbia university. To compensate in some small degree for the cancelled "junior year abroad," one of the dormitories was redecorated and refurnished in the French style to house some 30 students who wished to become proficient in speaking French. Enrolment at the college for the academic year 1941–42 was 2,084 students; the faculty numbered 254; the number of volumes in the library was increased to 285,132. The endowment in 1941 was $6,431,828.69. (M. B. M.)

Smith, Preserved (1880–1941), U.S. historian and professor, was born July 22 in Cincinnati, Ohio. He began his academic career as an instructor in political science at Williams college, 1904–06, and from 1907 to 1914 he was a fellow in history at Amherst. He became lecturer in history at Harvard in 1919, and in 1922 he was appointed professor of history at Cornell. Dr. Smith wrote extensively on history; among his works are *The Life and Letters of Martin Luther* (1911); *The Age of Reformation* (1920); *Erasmus—A Study of His Life, Ideals and Place in History* (1923); *A Key to the Colloquies of Erasmus* (1927), and *A History of Modern Culture*, which appeared in two volumes, vol. 1, *The Great Renewal 1543–1687* (1930), and vol. 2, *The Enlightenment, 1687–1776* (1934). He died in Louisville, Ky., May 15.

Smithsonian Institution. The institution was founded in 1846 by bequest of James Smithson of England, "for the increase and diffusion of knowledge among men." The governing body is a board of regents. Executive officer, Dr. Charles Greeley Abbot, secretary. The institution directs six government bureaus; also the Freer Gallery of Art and the Division of Radiation and Organisms.

Activities in 1941.—*Smithsonian:* Engaged in several national defense projects; installed new index exhibit in Smithsonian building; completed fifth year of weekly educational radio broadcasts, "The World Is Yours," in co-operation with U.S. Office of Education and National Broadcasting company; publications issued (Smithsonian and all its branches), 78; distributed, 125,837 copies.

National Museum: Specimens added to collection, 326,686; numerous scientific expeditions in the field; 14 special exhibitions held; visitors, 2,500,302; publications issued, 25; distributed, 52,170 copies.

National Gallery of Art: Gallery established by joint resolution of congress. Art works and building to contain them were a gift to the nation by the late Andrew W. Mellon. The gallery is designated as a bureau of the institution but is administered by a board of nine trustees; David K. E. Bruce, president; David E. Finley, director. The building was completed at a cost of $15,035,597, and was opened to the public March 18, 1941. The building also houses the Samuel H. Kress collection of Italian paintings and sculpture, a gift of Samuel H. Kress and the Samuel H. Kress foundation to the gallery.

National Collection of Fine Arts: This name designates art collections administered by the Smithsonian Institution. Eight special exhibitions were held; the 20th annual meeting of the Smithsonian Art commission (formerly National Gallery of Art commission) was held Dec. 3, 1940.

Freer Gallery of Art: Added to its collections Chinese bronze and jade, Chinese and Persian porcelain and pottery; Arabic manuscripts; and Indian and Persian painting. Visitors, 111,784.

Bureau of American Ethnology: M. W. Stirling, chief, directed an expedition, in co-operation with the National Geographic society, to Mexico, where 20 stone monuments were unearthed and photographed, two initial-series dates were deciphered, and stratigraphic work was extended at Cerro de Mesa and a large number of stelae were excavated at Izapa. Other field work on American Indians was conducted by the following members of the scientific staff: Dr. J. R. Swanton, Dr. F. H. H. Roberts, Jr., Dr. J. H. Steward, Dr. William N. Fenton; linguistic studies were conducted by Dr. J. P. Harrington; Dr. Henry B. Collins, Jr. continued work on prehistoric Eskimo material excavated in 1936 around Bering strait; Miss Frances Densmore, collaborator of the bureau, continued her study of Indian music; publications issued, 3; distributed, 11,882 copies.

International Exchange Service: Official agency for the United States for interchange with other countries of governmental and scientific documents; packages of such material handled during year numbered 576,282; weight, 388,649 lb.

National Zoological Park: Dr. William M. Mann, director, returned from the Smithsonian-Firestone expedition to Liberia and brought back 200 animals for the collections; new restaurant building built under an allotment from PWA was completed; total number of animals in collection, 2,380; visitors, 2,430,300.

Astrophysical Observatory: The observatory maintained solar stations at Mt. Montezuma, Chile, Table mountain, Calif. and Tyrone, N. Mex., and continued work on a complete revision of all solar-constant values since 1923.

Division of Radiation and Organisms: Carried on investigations in the field of radiation in relation to plant growth, especially photosynthesis, respiration and chlorophyll formation, the influence of light in early growth of grass seedlings and the influence of cultural conditions on the growth of algae. The division published six papers. (C. G. A.)

Smoot, Reed (1862–1941), U.S. senator and Mormon leader, was born Jan. 10 in Salt Lake City, Utah. An expert on tariff, taxation and public finance, he fought against tax-exempt bonds in 1918 and proposed a sales tax in 1920 to pay the soldiers' bonus. As an advocate of economy, conservative Republicanism and a high tariff, he helped frame the Payne-Aldrich bill and the Fordney-McCumber tariff and was co-author of the Smoot-Hawley tariff act of 1930. Smoot served as a senator from Utah from 1903 to 1933, and after his defeat in the 1932 senatorial race he retired from politics. He continued, however, to take an active role in the Mormon church. He died in St

Petersburg, Fla., on Feb. 9. (See *Encyclopædia Britannica.*)

Soap, Perfumery and Cosmetics. The expansion of sales volume, which began with the outbreak of war in Sept. 1939 and continued through 1940, continued through 1941 in all three of these industries, stimulated not only by vastly increasing industrial employment and pay rolls, but also by the steady decline of foreign competition. With one or two exceptions there were, for example, no genuine French perfumes left on the U.S. market by the end of 1941.

Government restrictions on the uses of materials for purposes other than defense resulted in many new manufacturing problems. The enormous government demand for alcohol stimulated the importation of large quantities of Brazilian and Puerto Rican alcohols which can be used in these trades only with considerable difficulty. The new problems were not confined alone to those raised by the alcohol and chemicals position. Packaging, always a major factor in these industries, was complicated by shortages of paper, cardboard, foils, plastics, cellophane, and so forth. In general it may be said the situation was well met. The chief sufferers were new products and new contenders for a share of the profits of the industries.

In the early fall a notable and far-reaching change occurred in the industries' relationship to government when the burden of the miscalled "excise" tax was shifted from the producers to the ultimate consumer. The change should result in greatly increased revenue to the government. The net increase in cost to the consumer is trivial. The relief to the industry, not only from the burden of the tax itself but also from the costly nuisance of recording and collecting, was expected to be very great.

Value of Production of Soap, Perfumery and Cosmetics, 1939 and 1937
(Source: U. S. Bureau of Census)

	1939	1937
Soap and Glycerine	$302,634,474	$301,201,547
Perfumes, Cosmetics and Toilet Preparations	147,465,585	132,330,481

Note the difference in increase of soap and glycerine which is a pretty staple industry as compared with that in a luxury industry (perfumes and cosmetics) from 1937, a bad year, to 1939.

Developments of the war during 1941 definitely altered the export trade of these industries, with what net effect on sales volume it was by Jan. 1, 1942, still too soon to say, although it would probably be downward. The closing of the South African market —always a large and lucrative one to United States producers— ostensibly to conserve shipping space for necessities, but more probably in the interests of currency control—would inevitably divert a considerable volume of United States export trade to manufacturers in Great Britain; it had, indeed, by the end of 1941, already begun to have that effect. No one could say whether this shift was temporary or permanent; but with respect to those British manufactories which were U.S. owned or controlled—and they were an important part of the British whole—it would probably be temporary.

However, the fact that Great Britain should be using for the exportation of luxuries material of which it was in scant supply had a certain significance; for example, as previously noted, paper and cardboard were important materials of these industries. Great Britain's supply was short. A lot of the paper and cardboard it produced was made from pulp which it imported from the United States under the Lend-Lease act. However insignificant the part of Great Britain's global production of these commodities that went into exported luxuries might be, it was bound to achieve a certain amount of political importance—less perhaps than it might otherwise have been had the United States stayed out of the war. (H. T.)

Soapstone: *see* TALC.

Soccer. In March of 1941 the prominent Botafogo Football club of Rio de Janeiro visited New York city for an exhibition game, following a tour of Mexico. A selected team representing the American Soccer league beat the Brazilians in a hotly contested event. In September the Puentes Grandes club of Havana played six exceptionally fast games in the east, winning two, losing three and tying one. A National Soccer league team visited Haiti and with gallant sportsmanship lost three, won one and tied one.

Seventy-one clubs took part in the open classic under the auspices of the U.S. Football association. The honours went to the Pawtucket (R.I.) Football club, which beat the Chrysler Football club of Detroit, Mich., in home-and-home games. Twenty-nine teams competed in the national amateur event, which simmered down to a dramatic final between Fall River and Chrysler, at Fall River, Mass., won by Fall River.

In the American Soccer league (amateur) the Scots-Americans of Kearny (N.J.) and the Philadelphia Germans fought a keen contest for supremacy. The Scots gained the verdict for the fifth year in succession, nosing out their rivals by one point.

(J. B. P.)

Socialism. In the United States the Socialist party until the Japanese attack on Hawaii, Dec. 7, 1941, continued its active opposition to American participation in the war and to the steps leading thereto. The party, which continually made plain its opposition to Hitlerism, nevertheless urged that the country could better advance democracy, and in the long run serve mankind, by keeping out of war. After the United States was completely involved in war, the national executive committee of the party sought to concentrate socialist thought and action on the preservation of civil liberty; establishment of democratic controls over war and postwar collectivism; preservation and improvement of the standard of living for low income groups despite the war; taxation according to ability to pay; and, in general, the achievement of a democratic socialism as against any more or less totalitarian form of state capitalism. It demanded the earliest possible achievement of an enduring and desirable peace which, it argued, should be anti-imperialist and find its support in the co-operation of peoples and not in the police power of an Anglo-American military alliance. The party's statements were strongly critical of the charter of the Atlantic as a basis of a just, democratic and enduring peace.

In the spring of 1941 many Socialists, not in sympathy with the antiwar position of the party, played a leading part in the formation of the Union for Democratic Action, strongly interventionist in outlook but concerned for the preservation and increase of democracy at home and the winning of a democratic peace. This did not absorb the older prowar Social Democratic federation which continued its educational activities.

The year 1941 was an off year in American political campaigns. Jaspar McLevy, leader of the Connecticut Socialist party, disaffiliated with the Socialist party of the United States of America was easily re-elected mayor of Bridgeport, Conn.

In the municipal elections of New York city the Socialist party felt compelled by its position to nominate its own city-wide ticket. The American Labor party went along with fusion but nominated many of its own councilmanic candidates unopposed by Socialists. The A.L.P. refused its endorsement to Harry W. Laidler, who had previously been elected to the council under its banner, with the endorsement of the Socialist party and other groups. Dr. Laidler was endorsed again by the Socialist party, the City Fusion party and by other civic groups but was defeated for re-election under the system of proportional rep-

resentation. Two members of the Social Democratic federation were, however, elected to the council under A.L.P. designation.

The city-wide ticket nominated by the Socialist party was headed by Prof. George Hartmann, Teachers college, Columbia university as candidate for mayor. The ticket received about 25,000 votes, doubling the very small vote of the party in the presidential election. The headquarters of the party and of its official organ, the *Call,* remained at 303 Fourth avenue, New York city.

War conditions prevented any effective effort for the reconstitution of the Socialist—as distinct from the Communist—International. The Communist International, completely controlled by Moscow, continued its dependence upon Stalin's will, and the Communist party in the United States at once switched from vehement anti-interventionism to equally vehement interventionism after Hitler's attack on Stalin. World-wide Socialist forces in 1941 had more stability of democratic conviction but found it impossible to go beyond the stage of hopeful thinking and very little planning for the reconstruction of their international movement.

In the year 1941, European Socialists were able to function openly in Socialist and Labour parties in their own countries only in Great Britain, Eire, Sweden, Switzerland and Finland.

Great Britain.—In Great Britain, members of the British Labour party during 1941 occupied 36 ministerial positions in the government and nine top empire posts. The Annual Labour Party conference reaffirmed the party's support of the government. The delegates at the June conference again expressed their belief in international economic planning and declared that "no peace which does not aim at a Socialist reconstruction of international society can be accepted by the Labour party as adequate to the sacrifices involved in the defeat of nazi and fascist aggression." In the summer the party set up a Central Committee on Reconstruction under the chairmanship of Emanuel Shinwell, M.P., and the secretaryship of Harold J. Laski.

On July 31, 1941, the party again refused to be associated in any way with the Communist party, declaring that the latter's policy had "never been determined by democratic methods, nor by reference to the needs and purposes of the British people."

James Walker, Labour M.P., on Oct. 8, 1941, presented before parliament labour's case for the public ownership and control of industry as the one means of securing 100% utilization of the national resources. The leaders of the party, in December, however, refused to support an amendment to the conscription bill which declared that, as a means to the "full utilization of the natural resources in the war effort," "essential industries vital to successful prosecution of the war, especially transport coal mining and the manufacture of munitions, should be brought under public ownership and control and that necessary legislation should be brought in as soon as possible." Ernest Bevin (*q.v.*), opposing the amendment, declared that property was already at the government's disposal and promised that questions of further requisition would continue to be judged on their merits. He added, "neither interest, property, persons nor prejudices can interfere with the goal of winning the war."

The small Independent Labour party surprised the British public and press by winning 20% of the vote for its secretary, Fenner Brockway, who was its candidate in a parliamentary by-election. The I.L.P. was vigorously pushing immediate socialization. It advocated peace by action of the workers of the belligerent countries. Formally it professed not only opposition to the national government under Winston Churchill (*q.v.*), but also to the war conducted by that government. Meanwhile its conduct and treatment of the war to most outsiders would seem to have been adequately described as one of highly critical support.

Sweden.—In Sweden, the Social Democratic government, headed by Per Albin Hansson, continued in office throughout 1941. The government sought during the year to keep from being drawn into war, while retaining its independence and freedom of action. It continued to strengthen its defenses against possible invasion. The Danish coalition government, headed by Premier Stauning, remained in office, but practically all power was usurped by the nazis.

Finland.—As the year advanced, Finnish Socialists, who were likewise represented in the government, began to bring increasing pressure on the government to consider ways and means of ending the war with Russia before the country found itself committed to a policy of territorial aggrandizement.

Norway.—The Norwegian Labour government in exile, with headquarters in London, continued to manage the large Norwegian merchant marine. All the belligerent governments in exile with headquarters in London contained Labour and Socialist members.

France.—In France, Leon Blum and other prominent Socialists continued under arrest on the charge of being responsible for plunging France into war. Many Socialists were in concentration camps. Many were executed. Marx Dormoy (*q.v.*), former Socialist minister of interior, was assassinated.

Germany.—In Germany, Dr. Rudolf Hilferding, former Social Democratic minister of finance, was found hanged in his prison cell. In France, Norway, Denmark, Belgium, Holland, Czechoslovakia and other countries under nazi control, Socialists were active in the underground movements.

British Dominions.—Socialist and labour political movements were influential in 1941 in the various British dominions. In Australia, after refusing to join other parties in forming an All-Party government, the Australian Labour party, on the resignation of the Fadden (*q.v.*) government in early October, formed a Labour government with John Curtin (*q.v.*) as prime minister.

POLITICAL OPPOSITES were thrown together for the first time in 1941 by their common views on U.S. nonintervention in the war. Hamilton Fish, Republican, and Norman Thomas, Socialist, united in voicing their opposition to the lend-lease bill

In New Zealand, the Labour government under the premiership of Peter Fraser, inaugurated during the year a system of national free medical care. In the May municipal elections, the party suffered several reverses.

In Canada, the Canadian Commonwealth federation, in the elections in British Columbia in October, returned 14 of its members to parliament out of a total of 48, as compared with 7 in the previous election.

South America.—In South America, the Socialists in 1941 showed chief activity in Chile. In this country several Socialists were members in the early part of 1941 in the Popular Front cabinet. They resigned prior to the March elections in protest against the inclusion of Communists in the Popular Front, but Pres. Pedro Aguirre Cerda (*q.v.*) refused to accept their resignation. In the March elections, in which they ran independently, they elected 15 deputies and 5 senators and later formed a pact of cooperation with the Radical party which opened up the way to the continuance of the Popular Front government. Following the death of the president, the Socialist party nominated as his successor Oscar Schnake for whom a campaign was in progress at the end of the year. Socialist parties were also legal, well organized and active in Argentina and Uruguay. In Ecuador, under its very imperfect democracy the party had a semilegal existence and in some other countries there were leftist groups. (*See* also COMMUNISM; LABOUR PARTY.) (H. W. L.; N. T.)

Socialist Soviet Republics: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Socialized Medicine: *see* MEDICINE.

Social Security. In 1941 no new national developments were recorded in the social security program until Dec. 19, when the president nationalized the federal-state employment services.

At the beginning of 1942 the social security program of the United States embraced the following major programs:

A Federal Plan of Old Age and Survivors Insurance.—Under this program "primary" benefits, computed at 40% of the first $50 of the average monthly wage earned after 1936, plus 10% of the balance up to $250 monthly, are paid to persons reaching age 65. For each year of minimum earnings after 1936, 1% of the primary benefit is added. Thus a worker who averaged $100 a month in the preceding five years was entitled, upon retirement in Jan. 1942, to $26.25 monthly for the rest of his life. In addition, his wife past 65 years of age is entitled to 50% of her husband's primary benefit. A similar benefit is paid to a dependent child of a retired or deceased worker under the age of 16, or 18 if regularly attending school. The benefit is raised to 75% of the deceased husband's monthly primary benefit for widows who are either aged 65 and over or have dependent children under the ages specified above. Parents who are wholly dependent upon a worker who leaves no other eligible survivors

are each entitled to 50% of the primary benefit. When no eligible dependent survives, a lump sum up to six times the primary annuity is paid. Retired beneficiaries may earn up to $14.99 per month from work covered by the program and any amount from work not covered by the program.

By the end of Nov. 1941 a total of 465,663 monthly awards were in force. As a result mainly of the war boom, 48,979 of these awards were at that time in the "deferred" or "conditional" payment status, *i.e.*, no payments were made to them currently or were to be made for an indefinite period. Of the total number of awards in force, 224,178 were for primary beneficiaries, 61,725 were for wives of beneficiaries, 117,699 were for children, 14,134 were for widows past the age of 65, 46,059 were for younger widows with dependent children and 1,868 grants were given for aged parents.

The amount of payments in force as of November was $8,476,025. But in view of the "deferred" and "conditional" payment status of many awards, there was spent only $7,522,865 that month. At the end of September the monthly primary benefits then in force averaged $22.69. With an average wife's benefit of $12.09, this gave aged couples a national average of $34.78 monthly. The average aged widow's benefit amounted to $20.26 while a child's benefit averaged $12.17, a younger widow's $19.49 and a parent's $12.94.

In addition to the large number of awards held up, the war also had the following effects on this system: In 1941 about 2,400,000 employers were estimated to have been reporting taxable wages on about 40,000,000 employees. This was in contrast with 1,740,000 employers on 23,000,000 employees in the first quarter of 1938. Moreover, whereas in the first quarter of 1941 a total of 74,567 awards were made, only 65,593 awards were made in the third quarter of that year. The greatest reduction was in primary benefit awards, which fell more than 11,000 from the third quarter of 1940.

From 1937 to Oct. 1, 1941, a total of $2,742,065,000 was collected in federal old age insurance taxes. The total benefits through Sept. 1941 amounted to $122,900,000. The old age insurance trust fund, including interest, totalled $2,575,417,000 at the beginning of October.

Railroad Retirement Act.—Under the second largest national system of old age protection, the Railroad Retirement act, 154,847 pensions and annuities of various types were in force on Sept. 30, 1941. The monthly amount in force was $9,862,086. The total receipts available to this program up to Oct. 1, 1941, were $647,877,000. Benefit payments up to that time amounted to $450,926,000. Assets of this fund totalled $196,951,000 (Sept. 30, 1941).

Unemployment Insurance.—The 51 states and territories administering unemployment insurance paid a total of $519,945,914 in benefits during 1940, approximately $90,000,000 more than in 1939. In June 1940, some 28,000,000 workers were covered by the unemployment insurance systems. As against 3,613,012 total beneficiaries in 34 jurisdictions in 1939, 5,051,766 workers received their first benefit cheque in 49 jurisdictions during 1940. The systems provided an average of $100.15 per worker in 1940, in contrast to an average of $84.24 for 1939. The average benefit for a week of total unemployment was less than $10 in 30 jurisdictions and below $7 in seven of them. The average duration of benefits in 25 systems ranged from 5.36 weeks to 11.97 weeks. The proportion of beneficiaries who exhausted their benefits while still unemployed in the same 25 jurisdictions ranged from 30.2 to 78.7. Benefit expenditures in 1940 represented 60.8 cents of every contribution dollar collected during the year as compared with 54.4 cents in 1939.

In 1941 most of the states amended their laws. The changes consisted mainly in boosting the benefit rates and their duration. In September there were 2,170,455 compensable unemployment compensation claims throughout the U.S. for which a total of $22,941,874 was paid in benefits. The total represented a decline of 13.4% from August and of 37.3% from Sept. 1940. In September an average of 493,423 workers received weekly unemployment compensation benefits. The total collections in taxes since these laws came into operation amounted to $3,883,249,000 by the end of September. The total benefits paid out amounted to $1,618,853,000 by the same date. The ratio of total benefits to total collections since benefits first became payable amounted to 56.7. Between Jan.-Sept. 1941 this ratio was only 37.8. The Unemployment Trust fund amounted to $2,289,500,000 by the end of September.

On Sept. 30, 1941, 4,355,860 job seekers were registered with the employment services throughout the U.S. During the month of September 545,676 persons were placed in jobs, an increase of 7.1% from the previous month. In December the president nationalized all the federal-state employment services. (*See* also UNEMPLOYMENT.)

Railroad Unemployment Insurance.—The railroad unemployment insurance system paid in September a total of $561,828 in 25,659 benefit payments. This contrasted with $991,712 in 66,336 claims in Sept. 1940. Since the beginning of this system a total of $33,786,000 was paid out in benefits.

Public Assistance.—The year 1941 marked some significant strides in public assistance legislation. In Sept. 1941 the recipients of public assistance throughout the United States were as follows: 2,204,189 old-age assistance beneficiaries received a total of $46,174,595; 383,796 families with 926,149 children received aid-to-dependent-children amounting to $12,562,222; 74,892 blind persons received aid-to-the-blind amounting to $1,909,998. The average old age assistance payment in September was $20.95 for the nation as a whole but ranged from $7.63 in Arkansas to $36.45 in California. The average payment under aid-to-dependent-children amounted to $32.73 per family in September, ranging from $13.38 in Arkansas to $55.51 in Massachusetts. The average monthly aid-to-the-blind pension amounted to $25.50 for the United States as a whole, with $8.99 in Arkansas and $46.65 in California. During the same month 817,000 cases received $18,547,000, an average of $22.70, in general relief throughout the U.S. (*See* also CHILD WELFARE; LAW: *Social Security;* RELIEF.) (A. EP.)

Great Britain.—Social questions were the subject of much study in Great Britain during 1941, largely with reference to postwar settlement. A social reconstruction survey was undertaken by the authorities of Nuffield college, Oxford, with G. D. H. Cole as chairman and with a government grant of £5,000; a committee was set up under Sir William Beveridge to inquire into existing schemes of insurance, industrial superannuation, workmen's compensation, unemployment assistance, etc.

Unemployment Insurance.—The prime minister's promise at the end of 1940 to replace the household means test for unemployment and supplementary old age pensions by a test of personal need based on the applicant's circumstances was implemented in 1941 by the Determination of Needs act. Under this: in the case of an applicant who is a householder and has wage earners as members of his household (relatives or not), it is assumed that each of such persons earning 55*s.* per week or over contributes 7*s.* weekly to the household expenses, 5*s.* if the wage is between 30*s.* and 55*s.*, 2*s.* 6*d.* if over 20*s.* and under 30*s.*, and nil if not exceeding 20*s.* If the applicant is not a householder and lives with a near relation (not by marriage), and the householder's income (exclusive of overtime, Sunday pay, etc.) exceeds a certain figure, it is assumed that the applicant does not pay for board and lodging and therefore these items are ignored in assessing need. This figure is £6 per week in the case of a householder with one dependent, with another 15*s.* for each additional dependent. Thus, a married couple with two children has to receive £7. 10*s.* per week before it is assumed that they provide a needy relative with free meals and quarters. In such a case the applicant's unemployment allowance is 5*s.* per week and he is not eligible for a supplementary pension. An applicant not affected by this rule (the majority) is granted in addition to the ordinary allowance a sum equal to his share of the rent, but limited to 5*s.*; thus, if he is one of a household of four and the rent is 12*s.*, the addition to his pension—subject to the assistance board's power of adjustment to meet special needs—will be 3*s.* The act also provides that the first £375 of new money invested in war savings shall be disregarded in assessing means.

The 1939-40 income of the unemployment fund was £66,992,668, and expenditure (excluding the £37,000,000 debt repayment) £46,345,472; the former was an increase of over £800,500 and the latter a decrease of over £18,420,000 on the final figures of the previous year. Expenditure on benefit fell from £54,222,033 to £36,644,912, and administration expenses from £6,035,662 to £5,335,385, these results being due to the general reduction in the unemployment level and the decrease in the percentage of unemployed qualifying for benefit. There was a balance from the previous year of £40,500,000, and the balance carried forward at the end of the year, after deducting the £37,000,000 repayment, was £24,155,841. The balance on the agricultural account rose from £2,746,648 at the opening to £3,253,770 at the close of the year, notwithstanding the increased benefits announced in 1940.

The total number of persons registered as wholly unemployed in Sept. 1941 was 230,621 as compared with 613,671 in Sept. 1940.

National Health Insurance.—In the autumn an interim act was passed to deal with immediate necessities pending the issue of the Beveridge committee's report. This raised, as from Jan. 1, 1942, the weekly rates of sickness and disablement benefits by 3*s.* for men and women alike, and raised the income limit of nonmanual workers from £250 to £420 per annum (bringing in some 500,000 persons) and that for workmen's compensation from £350 to £420 per annum. Contributions were increased by 2*d.* per week, shared equally between employers and workers, and the annual additional charge of the exchequer was estimated at £1,300,000.

(L. H. D.)

Social Service. Important changes in social service in 1941 reflected the improvement in large areas due to the better employment and higher wages resulting from the impact of the defense program. Relief had been a less serious problem both for public and private agencies although in areas without defense industries there still were inadequate relief, or no relief, and resulting distress. There was renewed interest in the provision for migratory labourers who became destitute. This problem was made more apparent by the large influx of workers

into the new industrial areas in search of jobs.

Congressman Tolan's important house committee, which was, in 1940, the Select Committee to Investigate the Interstate Migration of Destitute Citizens, became in 1941 the Committee Investigating National Defense Migration. This committee held public hearings from coast to coast, but legislation to help the situation was delayed.

The rising cost of living brought hardships to the people who were clients of social agencies, but the expansion of the food stamp plan was of great assistance.

The private agencies organized in community chests in 314 different cities raised $55,865,065 (not including funds raised for defense and war social service needs) in 1941 to carry on during 1942 as compared with $55,602,133 raised in 1940. That is, the effect of the special "drives" did not affect appreciably the usual funds raised by private contributions for social work.

A 1941 report showed that in 34 urban areas reporting to the United States children's bureau, expenditures for health and welfare activities amounted to $548,000,000, or approximately 5% of the income of the residents of those areas, excluding payments by recipients for services, an important item in the health field. Many cities showed a decrease in their combined total welfare bill as a result of the decrease in the expenditures for various kinds of relief. (*See* RELIEF.)

Of the $31.79 per capita expenditures reported by all agencies, $28.23 in the 34 areas was expended by public agencies. In the field of relief and family welfare services, per capita expenditures were $24.10 for public agencies and $0.99 for private agencies.

Various statutory changes in welfare provisions came from the 43 different state legislatures that met in regular or special session in 1941. Many of these changes in state laws affected the state programs under the Social Security act. (*See* SOCIAL SECURITY.) There were some changes in state welfare organization and administration and marked improvement toward better welfare personnel came as a result of the merit system provisions in the 1939 amendments to the Social Security act which had been slowly implemented by the state welfare authorities. The attempt to protect welfare personnel from political interference made great progress in 1941 as in 1940 but the progress was particularly noticeable in state personnel administering public assistance and other Social Security provisions and there was still great opportunity for improvement if the patronage system was to be divorced from the public social services. (E. AB.)

Societies and Associations: *see* under specific name.

Sociology. With the coming of World War II, social scientists of every variety were expelled from the totalitarian countries and many of them found final refuge in Britain, Latin America and the United States. Among these social scientists the sociologists were perhaps the most prominent for they would not have chosen their particular academic specialty had they not been men who were temperamentally innovators. The traits which led them to break with academic orthodoxy were largely the same as those which kept them from identification with "old foes with new faces"; namely, the rising totalitarianisms. In Germany, for example, the few sociologists who remained were either men whose age and silence kept them from being disseminators of "dangerous thoughts," or they were young nazis whose glib talk about the "folk-community" and the "mission of leadership" endeared them to the powers that be. In France the shift from "liberty, equality, fraternity" to "family, country, work" had been paralleled by totalitarian trends in the universities. The important Durkheim school, which counted among its numbers the majority of French sociologists, suffered the triple disadvantage of a Jewish founder, sponsorship of secular education (and hence of anticlericalism) and devotion to the Third republic. The great sociological tradition of France probably was not dead, but it was quiescent. Few French sociologists were able to make their way to other countries—but perhaps they were willing to share the fate of their fellows, incredible as that might seem.

In Britain the influence of the émigré sociologists, most of them German, was salutary; Karl Mannheim, Adolf Löwe and a host of others did much to reinforce the forlorn heirs of the Hobhouse school, and sociology of knowledge, sociology of religion, and several other branches of the science were introduced. The Le Play tradition represented in the *Sociological Review* and Le Play house was likewise rejuvenated and in considerable measure divested of its sectarian character.

These were not the only influences at work in Britain. The success of the Gallup polls in the United States led to a British variant of them in the late '30s. Even before this, however, some left-wingers had started the Mass Observation movement. Tom Harrisson, one of the founders, was initially trained as an anthropologist; another, Charles Madge, had extensive experience as a journalist specializing in the human-interest story. This combination was in many respects a valuable one, but its strength lay at the observational and descriptive levels rather than at the analytic.

In 1941 Mass Observation work was much concentrated on problems of morale, and many important studies were made in towns that had suffered most heavily under the German assault. Other subjects of 1941 investigation were saving habits, attitudes toward joining the women's service, clothes rationing, housing and neighbourhood attitudes. Along with the professional field work, the national panel of voluntary observers contributed important material on a wide range of subjects, from religious attitudes to personal fears. Not the least important of Mass Observation's wartime activities was its war library, which collected ephemeral documents such as local newspapers, circulars, menus and house journals. These were not systematically collected by any other organization, essential as they are for the sociological analyses of wartime Britain that might later be written. Some of Mass Observation's collection was in 1941 available in duplicate at the University of Chicago, although of course much had to remain in Britain.

Latin America had long had its own distinctive varieties of sociological thought. The strongest influences from abroad, some flowing in the ordinary channels and some issuing from émigrés, were German and French —indeed, it is quite safe to say that sociologists such as Scheler, Alfred Weber, Bouglé and Richard were better known south of the Rio Grande than in the United States and Canada.

German influence seemed to be strongest in Argentina; Brazil had a considerable admixture of French along with the German—perhaps because of the fact that French rather than Spanish is the chief language of scholarship in this Portuguese-speaking nation. In Chile during 1941 North American sociology had one of its first representatives, Professor W. Rex Crawford of the University of Pennsylvania; another North American, Professor Donald Pierson, had for some time been identified with the Escuela Libre de Sociologia y Politica of São Paulo, Brazil.

In Mexico there was a flourishing institute of social investigation in conjunction with the Universidad Nacional Autónoma de Mexico at Mexico City. The institute of social investigation sponsored by the University of Mexico issued an excellent sociological review, the *Revista Mexicana de Sociologia*.

Implied in the reference just made is a fact worth noting; namely, that throughout all of Latin America there was little or no distinction between anthropology and sociology. This probably is as it should be, for in the United States during 1941 the *rapprochement* of social anthropology and sociology was one of the most striking developments. This mutual incorporation of new points of view and new techniques was possible without disrupting the present scientific division of labour, although here and there the ultraspecialized were heard to complain. Perhaps the most important factor in making sociological and anthropological co-operation possible was the increasing awareness, on the part of both lay and academic publics, that sociology is not synonymous with the study of "social problems," social work, social planning or socialism, and that anthropology has not exhausted its repertory when it has dealt with "the lesser breeds without the law." Ralph Linton and Bronislaw Malinowski, both social anthropologists, addressed the American Sociological society at its December meetings in 1941, and the works of Arensberg, Redfield and Warner, likewise anthropologists, dealt with topics and peoples hitherto handled by sociologists exclusively.

Perhaps the most well marked 1941 trend in the field of sociology per se was in "sociometry." This specialty, christened by the émigré psychiatrist-sociologist, J. L. Moreno, oscillates between a kind of sociotherapy of mental ills, called the psychodrama, and a "quantitative"-graphic method of describing social processes and social structures. The journal of the movement, *Sociometry*, in 1941 came under the editorship of Professor George A. Lundberg of Bennington college, who gathered about him an imposing array of sponsors and contributing editors. Undeniably there was much faddishness in the sociometric movement; the mixture of a method of healing mental ills by acting out thwarted im-

pulses combines appealingly, for most Americans, with the graphing and "measuring" of social conduct. In spite of uncritical enthusiasm, however, there is a sound sociological core in sociometry, for some aspects of it go back to the work of Simmel, Wiese, Tarde, Cooley and Mead, as Moreno freely acknowledges.

This sociologist or, more strictly speaking, sociometrist cannot properly be classed among the recent émigrés for he came to the United States from Vienna in the late 1920s. Later arrivals from many parts of Europe were legion, but among the most prominent might be named: Paul Honigsheim, interrelations of anthropology and sociology, sociology of religion and several other fields; Godfrey Salomon, sociological training of administrators; Georges Gurvitch and N. S. Timasheff, sociology of law; Eugen Kulischer and Rudolf Heberle, sociological aspects of migration; Henry Jordan, Sigmund Neumann and Hans Speier, interrelations of sociology and political science; H. H. Gerth and Paul Lazarsfeld, public opinion studies and other varieties of psycho-sociology; Hans von Hentig, criminology and penology; Werner Landecker, Heinrich Infeld, Erich Franzen, Alfred Salomon and N. C. Leites, systematic sociology; Kurt Wolff and Ernst Manheim, sociology of knowledge. Most of these men were on the staffs of universities, research institutes or specially created schools such as the University in Exile, but several of them had not found posts in 1941. In general it can be said that the émigrés did not exert much influence. The reasons are numerous: first, slowness of assimilation to North American modes of thought and instruction; second, reserve or lack of appreciation on the part of native sociologists, many of whom literally did not know what the émigrés were talking about; third, ultra-conservative editorial policies in the learned journals; fourth, the textbook pattern of publishing in the United States—treatises with small sales prospects had to be subsidized; fifth, occasional manifestations of arrogance by émigrés who overvalue their European training in the changed situation; sixth, jealousy and fear among those native sociologists who feel insecure against "outside" competition; seventh, strong émigré aversion to the quantification so beloved in the United States; etc.

S. C. Dodd spoke before the Committee on Conceptual Integration and the Sociological Research association in Dec. 1941 and won a respectful hearing (because of his obvious sincerity and dispassionateness) from those who on methodological grounds might be most opposed.

In some respects related to the quantifying trend, but in others independent thereof, was the interest in sociological prediction manifested in 1941.

Almost diametrically opposed to the varieties of North American sociology thus far noted is the *Social and Cultural Dynamics* (4th and final volume, 1941) of P. A. Sorokin. This is a grandiose attempt, Spengler-like in its sweep, to chart the future of civilization. Although much of the research was done by a staff of assistants, Sorokin's categories of "ideational-idealistic-sensate" dominate the whole, and seem to make the entire treatise a projection of his strong personal preference for a peasant society controlled by religious sanctions akin to those of Graeco-Russian Orthodoxy or Roman Catholicism. Sorokin's proclamations of the decadence of western civilization were sharply challenged by such eminent sociologists as R. M. MacIver of Columbia—in fact, the Harvard prophet had only a small cultlike following. Likewise with only a few adherents but of far greater scientific probity was F. J. Teggart, the republication of whose *Theory and Processes of History* (1941) should do much to counteract emotionalism and loose generalization in the sociologist's approach to world history.

Analytic or systematic sociology markedly contrasting with the all-inclusive speculations of Sorokin was represented in 1941 by the publication of Leopold von Wiese's *Sociology*, translated by Franz Mueller (1941). In 1941, Vilfredo Pareto provided the conceptual tools for one of the most significant studies of rural life yet to appear in the United States, George C. Homans' *English Villagers of the Thirteenth Century* (Cambridge: Harvard University Press, 1941). If all adherents of Pareto wrote books like this, the curse of the faulty conceptual scheme centring about "residues" and "derivatives" would be lifted. Moreover, Homans provided a splendid source of enlightenment for the rural sociologist; instead of cherishing the pathetic hope that the Hopi or the Navaho will give the clue, the analyst of rural life may decide to examine the immediate antecedents of the social patterns within which he lives and works. Homans' approach would have vastly improved studies such as the sociological portion of the department of agriculture's publication, *Farmers in a Changing World* (1941), edited by Gove Hambidge and M. J. Drown. The election of Dwight Sanderson of Cornell, one of the most analytically minded of rural sociologists, to the presidency of the American Sociological society for 1942 might help to further research along the lines indicated by Homans.

The *American Sociological Review* continued in 1941 as the official publication of the American Sociological society, but in the summer of 1942 would have a change in editorship; Read Bain of Miami university was to be succeeded by J. K. Folsom of Vassar college. The *American Journal of Sociology*, an organ of the University of Chicago, continued its aggressive editorial policy, already exemplified in timely special issues such as that dealing with war in Jan. 1941, and the one on national morale in Nov. 1941. The *Journal of Social Philosophy*, sponsored primarily by members of Columbia and the College of the City of New York faculties, continued as one of the most stimulating periodicals, although it perhaps cannot be classified as sociological in the narrower sense. The *Annals of the American Academy of Political and Social Science* from time to time publishes issues of sociological import; J. H. S. Bossard and J. P. Shalloo were special editors during 1941 of child welfare and of criminological numbers respectively that have some relevance to sociology as currently taught in the United States. *Social Forces*, published at the University of North Carolina, retained its regional emphasis. Clearly among the better sociological journals, it is primarily southern in orientation. Similarly regional is *Sociology and Social Research*, published by the University of Southern California. *Social Research*, a quite different journal, is published by the University in Exile, and affords a vehicle for some of the best émigré work. Sociology may be said to have ample publication facilities in the United States where shorter articles are concerned; the major lack seems to be an organ for longer presentations that are still too brief for book format.

In the United States the utilization of sociologists in the armed forces, in spite of totalitarian pioneering, was not practised. The appointment of Mark McCloskey, a former social worker, was a step in the right direction, but social work is not sociology. In the governmental bureaus there was a somewhat better situation. Reporting to the American Sociological society in Dec. 1941, George A. Lundberg showed that Washington takes considerable advantage of the offerings of sociologists. Although these sociologists were placed primarily in the bureau of the census and the department of agriculture, and although they sometimes were brought in under the protective cloak of "economist" or "statistician," there was ground for a good deal of optimism. This arose from the fact that the sociologists in the various bureaus acquitted themselves so well that there was a steadily increasing demand for their services as sociologists.

(H. BEC.)

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Sodium: *see* METALLURGY.

Sodium Carbonate. Production in the United States gradually increased after 1930, and reached 130,034 short tons from natural sources in 1940, mostly from the natural brines at Searles and Owens lakes in California. Canada had a small output in British Columbia, but this amounted to only 220 short tons in 1940, against imports of crude soda that have ranged from 1,500 to 5,000 tons. Kenya produces about 40,000 tons annually at Magadi lake, and small amounts are recovered in Egypt and South Africa. (G. A. RO.)

Sodium Sulphate. Production from natural brines in the United States increased heavily since imports of salt cake were restricted by war conditions, receipts having been cut by more than half in 1940. Production of natural sulphate was 187,233 short tons in 1940, having increased by 37% over 1939 and 133% over 1938. Canadian production increased by 40% in 1940, to 94,260 short tons, and Chile recovered amounts almost as large as a by-product of the nitrate industry.

(G. A. RO.)

Softball. Even surpassing baseball, in 1941 softball counted 2,750,000 players among young men and women, comprising 115,000 teams. The amateur Softball Association of America is the governing body of the sport. The 1941 championships, held in Detroit, Mich., provided plenty of excitement as well as new champions in both the men's and women's divisions. The Bendix Brakes from South Bend, Ind., emerged victorious in the men's section, succeeding Rochester, N.Y., the 1940 victors. The girls' Midgets team from Tulsa, Okla., won the crown from the Phoenix Ramblers of Arizona. Teams of women were becoming more numerous, and they played with as much speed and skill as the men. Games are played both day and night, and players are often arrayed in bright coloured uniforms of distinctive patterns. (J. B. P.)

Soil Erosion and Soil Conservation. With the entire world engaged in war at the end of 1941, the science of soil conservation became increasingly important. Those nations were most apt to survive which made the most intelligent use of their resources, and not the least of these resources were soil and water.

The war, with its increased demands for food and other products of the soil, forced even more intensive cultivation of soil than was normally practised. This was particularly true since some of the nations which formerly supplied a considerable amount of foodstuffs to the axis nations were at war with these countries.

Erosion conditions and conservation activities, if any, within most of the occupied territories of Europe were matters for conjecture only, although before the war began erosion by both sand and water was known to have reached serious proportions in some of the countries which in 1941 were under domination of invading forces. The chances are that the soil resources of these occupied territories likewise were being exploited by the conquerors, probably without much effort to protect them.

When the federal government in the United States undertook to build up its own defenses and increase the size of its armed forces it meant more food would be needed. When it undertook to supply foodstuffs to its warring allies and build up reserves for the future it became apparent at once that a considerable increase in farm production in certain lines was imperative. Added to the increased production necessitated by the lend-lease purchases and to the increased consumption because of army and navy expansion was an inevitable increase in consumption by the civilian population because of an improved employment situation.

Soil conservation districts, local units of government organized by farmers, under various state enabling laws, to enable them to carry out their conservation projects co-operatively, constituted one of the important channels through which the national conservation program essential to protection of soil and water resources was being carried out concurrently with the increased war production.

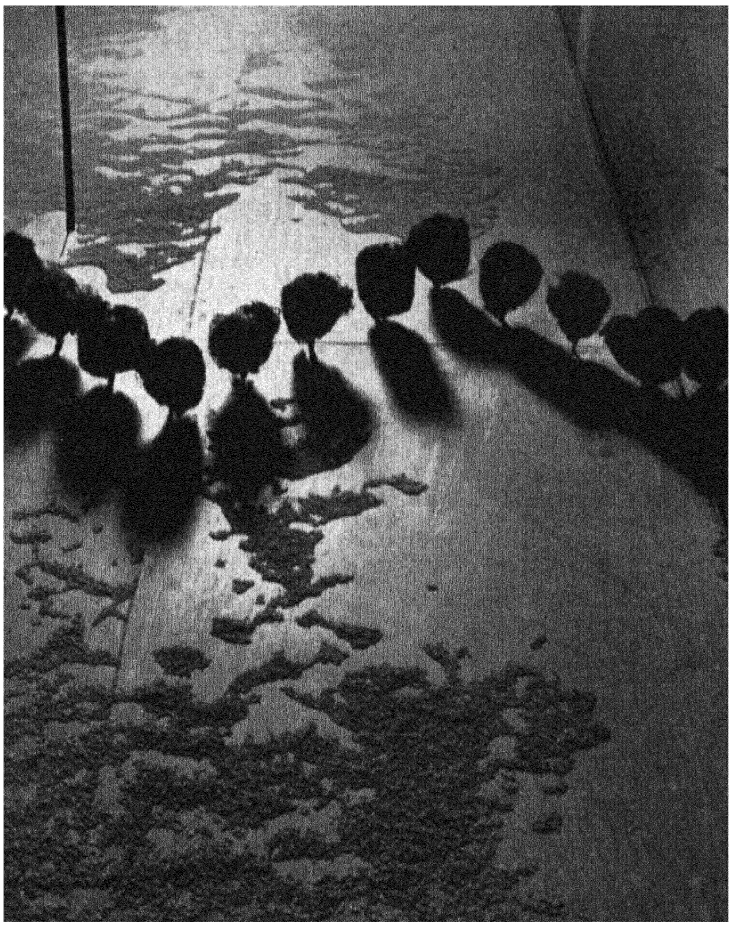
These districts which are initiated by, made up of and operated by farmers were at work throughout the United States. All except six of the 48 states adopted legislation authorizing farmers to set up soil conservation districts, and 1941 drew to a close with 642 districts established throughout the 42 states, representing a farm area of more than 378,000,000 acres or approximately one-fifth of the total land area of the United States. One state—Alabama—was within the boundaries of soil conservation districts.

Soil conservation districts are authorized by law to seek and accept aid in conservation work from the soil conservation service and other agencies of government, state and local as well as federal. Throughout 1941 the soil conservation service assisted the districts in carrying their own local conservation programs by furnishing trained technicians as well as equipment and materials where practicable.

One of the most significant developments in soil conservation work in the United States during 1941 was the increased utilization of subsurface tillage, for erosion control and moisture conservation. Experiments had been carried on before 1941, but during that year for the first time, it was put into use over large areas with encouraging results. In some parts of the country it was found that subsurface tillage cut down erosion and runoff even more effectively than basin listing. In subsurface tillage, crop residues are not turned under; rather the soil is cultivated by an implement that runs slightly beneath the surface and loosens the soil without turning under the vegetable matter, such as stalks, that help to hold the soil in place. Farm machinery manufacturers and farmers co-operated with soil conservation technicians in developing equipment for this work.

Control of irrigated land was improved during 1941 by substituting wide flat-bottomed furrows for the usual V-shaped furrows, and this change in method of cultivation likewise necessitated some changes in the farm machinery used. Improved methods of distributing irrigation water helped dry-land farmers by reducing operation costs and saving soil and water during 1941.

Various soil conservation practices had been put into effect on 31,500,000 acres of land in the United States under supervision of department of agriculture technicians. More than 2,260,900 acres of land unsuited for crop production had been retired from improper uses. The practices included contour cultivation, strip cropping, terracing, reforestation, range development, gully control and similar measures. The land retired under the land utilization program was developed as pasture, range, forest, and wild-life refuges according to its capabilities and included 138 projects in 44 states. There were at the close of 1941, 4,000 demonstration farms in 46 states and Hawaii and 182 demonstration projects in 46 states. The demonstration projects averaged 25,000 acres in size, and each included a number of farms. These involved a total of 36,083,000 acres, 2,168,000 in individual farms and 33,315,000 in project areas.



MODEL LAYOUT OF TREES in a wind tunnel at the California Institute of Technology, Pasadena, Calif., used to determine what patterns afford the greatest protection against wind erosion

The use of cover crops to conserve and improve soil was greater in 1941 than in any previous year. Perennial legumes such as kudzu and lespedeza sericea were used in many parts of the country and particularly in the southeast. In other parts of the country, particularly in the northern great plains, southern great plains and the Pacific southwest, various types of native and imported grasses were being used. Up to Jan. 1, 1942, more than 100 native plants never before used had been tested by the soil conservation service in co-operation with the bureau of plant industry and state experiment stations to determine their value in soil holding, soil building or for range improvement. More than 215,000 acres of kudzu had been planted in the southeastern states at the end of 1941. Seeds of many native and imported grasses also were harvested to furnish supplies for use in the conservation program.

More than 150,000,000 trees and other plants were furnished during 1941 by 30 soil conservation nurseries for the use of districts and other co-operators in erosion control plantings. These included among the trees: juniper, oak, black locust, ash, tulip poplar, hackberry, cottonwood, willow and five varieties of pine; among the shrubs: wild plum, viburnum, dogwood, Siberian pea and privet, mostly plants adopted to wild-life conservation. The herbaceous plants were mostly perennial legumes and grasses. In the meantime, research to discover other plants that would help control erosion and that might also add to the farmer's income was continued.

Dry-Land Farming Areas.—The soil conservation service has done considerable work in the dry-land farming areas of the United States for a number of years. The use of strips of crested wheatgrass, which provides hay and at the same time helps to hold the soil in place, is one of the important factors in control of wind erosion in the northern great plains region. Kikuyu grass, an import from Uganda, has been used to help prevent gullying in the Pacific southwest.

There had been few dust storms since the disastrous years of the middle '30s and none of tragic proportions. Blowing continued locally in various parts of the country but the use of contour cultivation and stripping, and other conservation practices had done much to counteract this.

In the southern great plains area sorghum, broom corn, kafir corn, cowpeas, small grains and annual legumes are used for soil improvement and to combat wind erosion.

Europe.—Since most of Europe was in the theatre of war it was im-

possible to get much authentic information concerning conservation work in the European countries. In general, the soils of northwestern Europe are in remarkably good condition, and erosion is negligible. Nevertheless, it had been the practice of the German government to take every possible precaution to protect its soil resources. Under the press of war Germany had to do more than that and was at work in 1941 on a project to improve approximately 123,500 acres of unproductive land in the Rhine valley north of Karlsruhe. Drainage and flood control are important phases of work on this project which was expected to be completed before the end of 1944. It is a small area, but in the face of the pressing food problems which Germany faced as a result of the war, it was extremely important.

Land reclamation is not a new thing in Europe. One of the largest reclamation projects ever undertaken is the drainage of the Zuider Zee in the Netherlands. In the reclaimed areas, conservation measures were established and farmers to whom the land was leased are required to maintain these measures.

Italy likewise has done a considerable amount of land reclamation both in the Pontine area near Rome, in the Veneto in the northeastern region, and near Genoa.

Erosion has been serious throughout the Mediterranean countries due probably more to deforestation and overgrazing than to cultivation, although primitive farming methods used in growing most crops have taken their toll.

Wind erosion and shifting sand dunes affect parts of Europe, the former in certain regions of Hungary and the latter in areas around the Baltic sea. The U.S.S.R. also had its erosion problems. Sheet and gully erosion were severe in the Ukraine and in central Russia. In the steppe country there was severe wind erosion and an expanding area of drifting sand in south central Asia. The expansion of mechanized co-operative farming in the drier sections increased the wind erosion problem, and control measures included shelter belts and the development of grasses resistant to drought and adapted to the plains country.

In the British Isles there is relatively little erosion and strenuous control measures are not required because of a grassland type of agriculture. However, as a result of increased cultivation due to war needs, the problems might become more serious.

South Africa.—There is considerable erosion in the various South African states, and the governments were taking steps to combat these conditions. Excellent conservation work has been done in the Transvaal and the Orange Free State. During 1941 the senate and the house of assembly of the Union of South Africa adopted an act designed to amend and consolidate the Union's laws on protection, management, utilization and tenure of forests, regulate the burning-over of the veld lands and make better provision for veld soil and water conservation. During the year the legislative assembly of Rhodesia enacted the Natural Resources law to set up machinery for combatting the considerable erosion damage already done, particularly in the Mazoe valley. This bill empowers the Natural Resources board to maintain general supervision of natural resources, and, on the recommendation of the board, the minister of agriculture and lands may construct and maintain works for the protection of the sources, course or feeders of a public stream, the disposal or control of storm water, the mitigation or prevention of soil erosion and the conservation of water. In addition, the board may order any landowner to undertake any measures considered desirable for conservation of natural resources. These may relate to methods of cultivation, use of land for pastures, control of water and retirement of land from cultivation.

Australia.—Erosion conditions in Australia are severe. There is widespread sheet erosion in Tasmania and severe erosion by water in the Queensland cotton-growing regions. The bush country and semiarid pastoral belt suffer from wind erosion, and there is considerable drifting of light sandy soils in South Australia, Western Australia, Victoria and New South Wales. Efforts were being made by the various state governments to correct these conditions. Legislation was passed in Queensland establishing the "Burdekin River Benefitted Area," in the Burdekin river valley, in which erosion control measures were to be carried out by the Queensland government. A soil conservation research station was established at Cowra in New South Wales to study soil and water losses and carry out research in erosion control and soil and water conservation. The government of Victoria made careful studies of erosion and conservation projects in that state, and the parliament adopted a soil conservation bill designed to conserve all natural resources within the state.

New Zealand.—During the latter part of 1941 a soil conservation and rivers control act was adopted by the New Zealand government. It was designed to set up a council to administer the act and provided for the establishment of soil conservation districts. The council is empowered to study erosion and its control, work on flood control projects, supervise or control the use of lands, establish soil conservation reserve areas and acquire private land for public work.

India.—India has a severe erosion problem and suffers from water shortages at certain seasons. Much of this has been caused by denudation of the soil and other kinds of mismanagement. Terracing, cover crops and hedges are used in some parts of India to stop or lessen the severity of erosion. In certain regions, including the Punjab, "antierosion circles" were being established by the government to combat this danger to the country's agricultural resources. Reclamation societies were set up for the purpose of reclaiming the large sandy beds of streams in the Siwalik hills. Co-operative societies of farmers were also being urged to push the work forward around the rural villages and considerable educational work was being undertaken to prepare the farmers of the villages for this work. Efforts were likewise being made in Ceylon, through legislation and governmental committees and boards, to deal with the erosion problem in that island.

Burma.—There is a wide difference in the types of erosion found in different regions of Burma, ranging from moderate sheet erosion to serious gully erosion on deep-soiled lands where cover has been removed and unscientific cultivation methods used. A considerable portion of Burmese soil, including the red lands of the Myelat, is particularly liable to gullying. A great deal of the low-lying land in lake basins and valleys had been almost ruined by siltation. This is not erosion properly speaking, but the results are similar since a considerable portion of the silt is useless and covers good topsoil. The problem in Burma is considered by the government to be urgent and a number of studies have been made to determine the best means of controlling and preventing erosion. Some of the principal means used in 1941 were reforestation of woodlands, restoration and improvement of grazing areas and improved methods of drainage and cultivation, in addition to the physical measures for control of gullying. Up to Jan. 1, 1942, this work had been carried out only on a small scale in local areas under supervision of the Burmese government, but a report issued by the deputy conservator of forests at Rangoon indicated that a great deal remained to be done. What effect the war, carried to the orient, would have on conservation work in Burma remained to be seen.

China.—The orient in general contains some of the worst examples of erosion in the world, as well as some of the oldest and best examples of erosion prevention. Additional efforts were being made in 1941 to combat the menace of erosion and to conserve the soil and water resources. Likewise, in that part of China under control of the Japanese government and known as Manchoukuo, work was being done in Pinkiang province. This program covered both flood protection work and land development work. It included construction of dikes, drainage gates, waterways, dams, flumes, development and protection of crop lands in low areas and the improvement of considerable uncleared land as farms, pastures and paddy fields. The work in Pinkiang province is a ten-year project and covers an area of slightly more than 864,000 acres, principally along the Sungari river and its tributaries.

Canada.—Erosion problems in the prairie provinces are similar to those in the northern great plains states which include wind erosion over large areas, as well as erosion by water. The parliaments of a number of these provinces have adopted conservation legislation, and farmers have been helped in developing water facilities for livestock and domestic use, and in establishing shelter belts of drought-resistant trees and planting suitable grasses.

Mexico.—There is considerable erosion in Mexico where farming on the steep slopes, which predominate over a great deal of the country, has caused severe gullying. Cultivation of the slopes is resorted to because Mexico does not have an abundant amount of good farming land. Overgrazing, particularly around Saltillo and Monterrey, caused considerable erosion and frequent floods resulted. In certain areas primitive control has been established where the natives were cultivating steep slopes on which they have built stone walls. Soil washed down against these walls gradually forms deep bench terraces which are effective for certain types of agricultural operations.

West Indies.—The close relationship between protection of forests and conservation of the soil was well recognized in the Dominican Republic, where a new variety of acacia tree was being used for reforestation purposes with excellent results.

Reforestation likewise was being carried out on an extensive scale in Puerto Rico. Nearly 90,000 acres of land under government control had been put in trees but more than 400,000 acres remained to be replanted. This was necessitated by severe deforestation which preceded the extension of commercial agriculture. By 1935, 75% of the topsoil had been washed off, 42% of the total land area of the island. Studies of the relationship of crops to land were being carried out at the experiment stations in Puerto Rico.

In Jamaica the Jamaica Agricultural society established an erosion control plot near Annotto bay. This was simply an erosion control experiment station on a small scale and adapted to the peculiar local conditions that obtain in Jamaica. Farmers were being urged to try on their own land the practices tried out on the erosion control plot. Khus-khus grass was being used as a soil binder and other crops such as peas, corn, bananas and plantains have been interplanted with the grass strips. Terracing was tried to some extent but without complete success, although according to the report of the supervisors, terraces contributed to some extent to the success of the work on the experimental control plot.

South America.—South America has some of the first notable erosion control structures in the world, which were designed and built by the Incas to provide irrigation and to prevent erosion. In various sections of the continent erosion by both wind and water had reached dangerous proportions, and many of the South American nations were taking steps to save the damaged land and to prevent extension of the damage.

In the central zone of the state of Minas Geraes, Brazil, erosion is a serious problem since increased agriculture development has begun to denude the land of its forests, and reforestation is not generally being practised. It was anticipated that the vast virgin agricultural areas in the west and north sections of the province would be opened up before soil conservation on a large scale was put into effect. However, experimental and demonstration work was being carried on. In the São Paulo province, where agriculture was mechanized more than in most other regions of the country, slight to severe erosion occurred on about 50% of the land, an area of more than 30,000,000 acres.

Chile suffers considerably from erosion and its concomitants of drought and flood. Absence of forests in the valleys of northern Chile results in tremendous floods, and the eroded topsoil carried away has caused serious sedimentation in many reservoirs. One dam, the Pangal dam, in Cochapoal, was completely covered by silt in about nine months. There is a great deal of erosion in other sections of Chile also. The principal measures for erosion control have been the planting of trees in marginal farmlands; changes in agricultural methods, especially in arid areas; and the increase of cattle production in the humid zones. Development of tree plantings and soil building is somewhat difficult in the drier regions due to frequent droughts throughout the summer.

Colombia, starting with fundamentals, established a "protected forest zone" where timber operations might be done only under government supervision. This zone was created by presidential decree under an act passed in 1939. The decree also provided for establishment of state nurseries to aid in reforestation of denuded areas.

Peru has a conservation problem peculiar to itself. There is little rain to cause erosion, there is little forest land to be preserved, and there is no

range problem. Conservation in Peru means largely conservation of water since this is one of the world's most arid regions. Water for irrigation was being obtained in 1941 by pumping it from a depth of 50 to 200 feet under the floors of the major river valleys. Also flood flows were being diverted from the rivers to suitable adjacent lands for irrigation purposes. It was believed, if these projects proved effective under actual trial, that agricultural production might be increased as much as one-third on areas under irrigation and that production on desert lands might be developed.

Venezuela, like most other South American nations, suffers from soil erosion, wind erosion being particularly bad in the eastern part of the country, while in the mountain regions of Venezuela there is severe sheet erosion and gullying. The Venezuelan government, however, was making an intensive study of the problem and its solution.

Toward the end of 1941, at the request of the government of Venezuela, the government of the United States sent a party of soil conservation experts from the department of agriculture to Venezuela to study their problems and advise them.

The Argentine has a serious erosion problem, including wind erosion in the semiarid middle west of that country, in the eastern section of La Pampa, southeast of Córdoba and west of Buenos Aires. Serious erosion by water is found in areas of abundant and intensive rains, particularly where there is too intense cultivation or grazing on steep slopes. A bill was introduced in the Argentine national congress during 1941 to establish a soil conservation program for the country. (*See* also AQUEDUCTS; DAMS; DROUGHT; IRRIGATION.)

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(H. H. BE.)

Solar System: *see* ASTRONOMY.

Soldiers' Bonus: *see* VETERANS ADMINISTRATION.

Solomon Islands: *see* PACIFIC ISLANDS, BRITISH; PACIFIC ISLANDS, MANDATED.

Somaliland, British: *see* BRITISH EAST AFRICA.

Somaliland, French: *see* FRENCH COLONIAL EMPIRE.

Somaliland, Italian: *see* ITALIAN COLONIAL EMPIRE.

Sombart, Werner (1863–1941), German economist, was born at Ermsleben in the Harz mountains on Jan. 19. An economist of world-wide fame, Dr. Sombart was best known for his work *Der Moderne Kapitalismus*, begun in 1902 and completed in 1926. He was one of the leaders in Germany of a movement to "isolate" economics and sociology from the conflict of politics. In a Stockholm lecture in 1922 he pronounced "dead" the cultures represented by the United States, France and Great Britain and urged the Germanic countries to turn to the east and to extend their culture in that direction. His works include *Die drei Nationalökonomien* (1930); *Die Zukunft des Kapitalismus* (1932); *Deutscher Sozialismus* (1934), and *Vom Menschen: Versuch einer Geistwissenschaftlichen Anthropologie* (1938). Dr. Sombart died May 19, according to a Berlin announcement; but the place of his death was not divulged. (See *Encyclopædia Britannica.*)

Sorghum: *see* SYRUP, SORGO AND CANE.

South Africa, British: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

South Africa, The Union of. A self-governing dominion of the British commonwealth of nations. The four provinces of which it consists, the Cape of Good Hope, Natal, the Transvaal and the Orange Free State, extend from the southernmost point of the African continent to the Limpopo in the north. The former German colony of South-West Africa is administered under mandate as an integral part of the union, but this territory has not been incorporated as a province. Area 472,550 sq.mi. (incl. Walvis bay, 430 sq.mi.); pop. (est. June 30, 1940), 10,341,200 (Europeans, 2,152,700; native 7,124,100; Negro 829,600; Asiatic 234,800). Chief towns (pop. census 1936): Cape Town (seat of legislature, 344,223); Johannesburg (519,384); Durban (259,606); Pretoria (seat of government, 128,621); Port Elizabeth (109,841). Governor general: Rt. Hon. Sir Patrick Duncan; languages: English 39%; Afrikaans, 56%; religion: European population: Christian (Dutch Reformed churches, 55%; Anglican, 19%; Methodists, 6%; Presbyterians, 5%).

History.—The chief events of 1941 fall under three heads: warfare, industrial expansion and internal political strains. The South African air force was active on many sectors of the East African front, and union land troops, after a rapid advance through Italian Somaliland, were the first imperial troops to enter Addis Ababa (April 1941), thanks largely to their excellent armoured cars and Negro transport drivers. Latterly, union forces had moved north into Egypt, but the consent of their parliament would be necessary before they could go outside Africa.

The union's industrial and military achievements had been remarkable for so small and divided a community; 150,000 British and Afrikaner volunteers were under arms, well equipped and fed from South African farms and factories. The civilian board of supply under Dr. H. J. van der Byl supplied ammunition of various types and armoured cars to other imperial forces, and large stores of foodstuffs were on hand. The poorer European folk showed themselves adaptable, and in spite of a shortage of machine tools and skilled labour, the framework of an industrialized community was being built up.

The budget reflected the growing strain of war. In 1939 a mere £14,000,000 was asked for, but for the year 1941–42 the union needed £72,000,000 out of a record total of £131,000,000. Of this amount £73,600,000 was to come from revenue and £57,300,000 from loan funds. One-quarter of the shortfall of nearly £8,500,000 from 1940 was to be made up by increased indirect taxation, and the remainder by increases in the company income tax and the "special contribution" of the gold mines (from 11% to 16%), the apportioning of the income of private companies among individual shareholders and a tax on undistributed profits to prevent evasion, and the deduction of ordinary income tax allowances from assessed taxation instead of from income before tax assessment. Other legislation included a far-reaching factory act and a workmen's compensation act which gave the government a monopoly of workers' insurance.

Money was plentiful, trade good and prosperity widespread, but the internal political situation was difficult. General Smuts, appointed a field marshal in the British army in May, had adequate majorities in both houses, but the *Ossewabrandwag* (Ox-wagon Sentinel), a so-called cultural Afrikaner association but in reality a nazi-minded organization, was strong. Its leader, Dr. van Rensburg, threatened recalcitrant Afrikaner politicians with violence, and after riots in Johannesburg, in which some of the police sided with the *Ossewabrandwag*, the government obliged all public servants to resign membership (February).

Meanwhile, the opposition Reunited Nationalist or People's party had split (Nov. 1940). General Hertzog, N. C. Havenga, ex-minister of finance, and some others broke away rather than agree to Dr. D. F. Malan's program, which ignored the British section. Havenga formed a small Afrikaner party to uphold neutrality and democratic parliamentary rule. He and Hertzog resigned their seats in the assembly (Dec. 1940). One wing of Malan's followers, led by O. Pirow, demanded a nazi new order, while the other advocated a narrow Afrikaner democracy similar to that of the republican Transvaal in the 1890s. Malan, who had made no comment on Germany's pact with the U.S.S.R.,

raised the cry of the "Bolshevik peril" when Great Britain allied itself with the U.S.S.R., but presently condemned Pirow's new order and offended the *Ossewabrandwag* (August). Hertzog then ranged himself with the Pirow faction by declaring that national socialism accorded with the Afrikaner tradition and was the only form of government that a victorious fuehrer would countenance (October). Havenga repudiated his old friend's new policy, but the internal politics of the union plainly depended upon the fortunes of war. South Africa on Dec. 9 declared war on Japan, Finland, Hungary and Rumania. (E. A. WR.)

Education.—State and state-aided primary and secondary schools (1938): European schools, 4,278; scholars, 386,880; native schools, 5,001; scholars 589,308; universities, number of students, 9,492.

Banking and Finance. Revenue, ordinary (est. 1941–42), £65,165,000; expenditure, ordinary (est. 1941–42), £72,000,000; public debt (March 31, 1941), £336,336,000; notes in circulation (May 31, 1941), £22,700,000; gold reserve (June 30, 1941), £51,800,000; exchange rate (1941), £1.SA=$3.98.

Trade and Communication.—External trade (1940) (exclusive of goods in transit and of gold bullion and specie): imports (total) £105,099,234; exports (domestic) £28,562,207; re-exports £5,528,430. Communications and transport: roads fit for motor traffic (1938–39) 87,495 mi.; railways, including South-West Africa (March 31, 1940) 13,645 mi.; airways, including South-West Africa (1939), passengers carried, 35,578; freight and mails carried, 2,640,984 lb.; mileage flown 1,751,453; shipping (1940) entered, 6,598; net tonnage 25,504,068; cleared, 6,554; net tonnage 25,315,168. Motor vehicles licensed (Dec. 31, 1939): cars and taxis, 318,628; buses, 1,763; vans and lorries, 50,249; tractors, 1,087; cycles, 23,452; wireless receiving set licences (1939), 221,282; telephones, instruments in use (1939) 190,195.

Agriculture, Manufacturing, Mineral Production.—Production (1939–40) (in metric tons): gold fine (1940), 436,631 kg.; diamonds (1939), 1,269,828 metric carats; maize, 1,824,700; coal (1939), 19,527,000; sheep, number (Aug. 31, 1939), 38,289,430; cattle, number, 11,852,736; wool (1939), 125,000; wheat, European cultivation, 416,700; cane sugar, refined, 474,500; iron ore (metal content) (1939), 312,000; pig iron and ferroalloys (1939), 300,000; steel (1939), 314,000; silver (1938), 1,135,374 fine oz.; manganese ore (metal content) (1939), 175,300; chrome ore (chromic oxide content) (1939), 72,600; asbestos (1938), 21,900; wine (1938–39), 1,555,000 hectolitres; tobacco (1938–39), European cultivation, 13,200; potatoes (1938–39), European cultivation, 172,900; oats, European cultivation, 80,700; barley, European cultivation, 20,500; copper (smelter production) (1939), 11,000; benzol (1939), 1,700; superphosphates of lime (1937), 164,000. Industry and labour (census 1939): establishments, 9,817; employees, European, 117,056; others, 189,087; value of gross output, £172,764,000; value added to materials used, £85,108,000. Employment index (average 1929=100): average 1939, 149; average 1940, 156.

South America: *see* ARGENTINA; BOLIVIA; PERU; ETC.

South Australia. A state of the Australian commonwealth 380,070 sq.mi. in area, bounded by longitudes 129° E. and 141° E., and by latitude 26° S. and the southern coast of the continent. The state governor in 1941 was Sir Charles Malcolm Barclay-Harvey. Pop. (est. Dec. 31, 1939) 597,045. Chief town and capital (pop. Dec. 31, 1939), Adelaide (322,990).

History.—The state elections held March 29, 1941 resulted in the return of the Liberal Country party government, under Thomas Playford, with increased strength. Voting is not compulsory in South Australia, and only about 50% of the electorate recorded their votes.

In January work was begun on the construction of a pipeline from the Murray river to Whyalla, a distance of 236 mi. The project was expected to take 2 years to complete and the estimated cost was £3,000,000. Construction and maintenance were undertaken by the state government, which entered into an agreement with the Broken Hill Proprietary, who was to pay a minimum of £40,000 a year for water supplied to Whyalla, and with the commonwealth government, which was to pay £37,500 a year for water supplied to the railways at Port Augusta. The new blast furnace at Whyalla, which had taken three years to build, began operations on May 26. Its output at the close of 1941 was more than 500 tons of foundry pig iron a day.

More than £4,000,000 worth of munition production orders were placed in South Australia during 1941, as well as large orders for clothing, etc., for oversea governments. Armament annexes were being established at Whyalla and Port Pirie, and extensive plants were being installed for forging and machining high explosive shells.

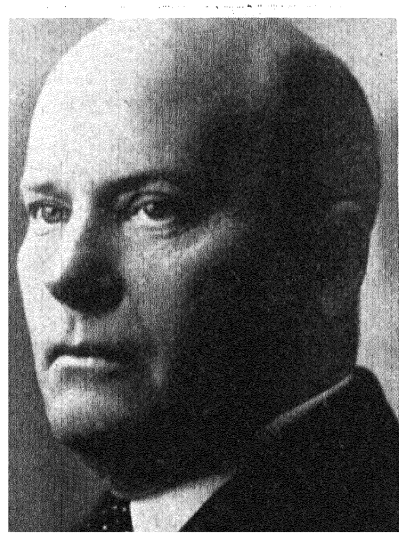
In consequence of these developments and of favourable pastoral and agricultural conditions, labour was scarce and the government contemplated some diversion of labour from unessential industries.

Finance.—In 1940–41: revenue, £A12,930,000; expenditure, £A13,010,000; debt outstanding (June 30, 1941), £A109,780,000.

Communication.—Roads (March 30, 1940), 23,848 mi. fit for motor traffic; railways (1939), government 2,558 mi. Motor vehicles licensed (March 31, 1941); cars, 58,360; trucks, 24,682; cycles, 9,143. Wireless set licences (March 31, 1941), 130,127.

Agriculture and Manufacturing. Wheat (1940–41), 18,000,000 bu.; barley (1940–41), 5,350,000 bu.; grapes (1938–39), 150,608 tons; currants (1939–40), 208,930 cwt.; wool (1939–40), 105,265,869 lb.; butter (1939–40), 22,938,381 lb. Industry, 1939: factories 2,067; employees 43,371; gross value of output, £A35,005,254; unemployment (March 31, 1941) 3.9%. (W. D. MA.)

South Carolina. A south-Atlantic state of the United States, and eighth of the original 13 to ratify the constitution, 1788; popularly known as the "Palmetto state." Area, 31,055 sq.mi., including 461 of inland waters; pop. (1940) 1,899,804; white 1,084,308; Negro 814,164; others 1,332; 75·5% rural; 24·5% urban; 0·3% foreign-born. Capital, Columbia (62,396). Other cities include Charleston (71,275); Greenville (34,734); Spartanburg (32,249).



J. E. HARLEY, who succeeded B. R. Maybank as governor of South Carolina Nov. 4, 1941. Gov. Harley died Feb. 27, 1942

History.—Gov. B. R. Maybank, though twice defeated by the courts, continued in 1941 to seek means of diverting part of the gasoline tax from roads to general purposes. A probation and parole board was created, but could not be given control of pardons, as Gov. Maybank desired, without constitutional change. Horse-race betting was legalized in several low-country "resort counties." Biennial sessions, twice popularly voted, again stranded on details. Prohibition, heavily voted, was enacted and provided that new revenues be found to replace the $3,000,000 from state liquor taxes by July 1, 1942. Legislation for regulating loan sharks again failed. Several Ku Klux klansmen were sentenced to prison for masked parades or whippings.

Gov. Maybank was elected U.S. senator to succeed J. F. Byrnes (*q.v.*), who was appointed to the U.S. supreme court. Maybank was succeeded by Lieut. Gov. J. E. Harley, Nov. 4.

Education.—Teachers' salaries were raised in 1941. Enrolment in white elementary schools for the year ending June 30, 1941 was 191,198; in white secondary schools, 74,874; in Negro elementary schools, 193,598; in Negro secondary schools, 19,372; in all public schools, 479,042. Expenditures for whites, $15,642,839; for Negroes, $2,810,917.

Public Welfare, Charities, Correction.—On Nov. 30, 1941, 62,045 families or unattached persons were certified to WPA, of whom 36.5% were working on WPA-financed projects. WPA expenditures in the state during the year ending June 30, 1941, were $29,283,509; average weekly employment was 29,798. During the same period, 17,415 needy aged received $1,652,596; 764 needy blind $97,352; 8,970 children $588,062, all the above funds being half federal and half state. State and counties shared equally in $216,035 spent for general relief to 2,153 persons. Unemployment insurance paid during the year ending June 30, 1941, amounted to $2,028,017. Insane and epileptics in the state hospital on June 30, 1941, numbered 4,670; on parole, etc., 730. Feebleminded have a special institution. The state penitentiary on June 30 had 1,321 inmates.

Communication.—Paved highways on June 30, 1941, totalled 6,803 mi.

Railroads totalled 3,563 mi. Several major aeroplane routes cross the state.

Banking and Finance.—There were 84 state banks (plus 4 branches) and 41 depositories and 22 national banks (plus 19 branches) June 30, 1941. Deposits and resources of each were respectively $63,344,183 and $72,327,309; and $127,529,000 and $138,984,000. Appropriations for general state expenses for the year ending June 30, 1942, totalled $13,483,937. Highway expenditures (gasoline and car licence income) exceeded this amount. Provision was also made for retiring a deficit of $1,831,936 in five years. The state debt on June 30, 1941 totalled $70,286,798, of which $63,432,960 was for highways. The federal government collected during the year ending June 30, 1941, $16,663,942 in internal revenues and $843,890 in import duties. Imports totalled $6,074,303 and exports $1,608,753.

Agriculture.—The value of 21 principal field crops in 1941 was $113,328,000; acreage harvested, 4,815,000; 17 vegetable crops, $5,883,000 from 87,020 ac. Droughts injured crops and caused a shortage of hydroelectric power. Farm electrification greatly expanded.

Table I.—*Principal Agricultural Products of South Carolina, 1941 and 1940*

Crop	1941	1940
Corn, bu.	22,316,000	23,733,000
Wheat, bu.	3,146,000	2,725,000
Oats, bu.	12,100,000	11,305,000
Hay, tons	477,000	438,000
Irish potatoes, bu.	2,548,000	2,875,000
Sweet potatoes, bu.	4,400,000	4,160,000
Tobacco, lb.	66,000,000	84,245,000
Cotton, bales	405,000*	066,000
Cotton seed, tons	180,000	430,000
Peaches, bu.	3,471,000	2,158,000

*Smallest since 1878.

Manufacturing.—The value of all manufactures for the year ending June 30, 1941 was $573,619,049; average employment was 145,889; wages, $118,625,941. The respective data for textiles alone were $382,753,951; 102,342; $87,078,249. War orders crowded many industries, including the building trades, especially near large military encampments.

Mineral Production.—The value of all minerals produced in South Carolina in 1939 was $5,422,079; in 1938 it was $4,364,034.

Table II.—*Principal Mineral Products of South Carolina, 1939 and 1938*

Mineral	Value, 1939	Value, 1938
Stone	$1,732,795	$1,315,999
Clay products	1,573,470	1,289,975
Raw clay	1,303,163	869,693
Gold	484,155	408,835

(D. D. W.)

South Dakota. A north-central state, admitted to the union Nov. 2, 1889; popularly known as the "Coyote state." Area, 77,047 sq.mi. (land area, 76,536 sq.mi.); pop. (1940) 642,961. Urban population, 158,087; rural population, 484,874; average inhabitants per square mile, 8.4. Ten cities had a population of 5,000 or more in 1940. Capital, Pierre (4,322). Largest city, Sioux Falls (40,832).

History.—Republicans retained complete control of the state administration, one U.S. senatorship and the state's two congressional members in 1941. Harlan John Bushfield began his second term as governor Jan. 7. The state legislature met in its 27th regular session for 60 days, passing amendatory, regulatory and routine laws necessary to the conduct of state business. Reduction of the general sales tax from 3% to 2% and modification of the state income tax met with popular approval.

Of 766 bills introduced, 375 became laws. George Mickelson, speaker of the house, and Lieutenant Governor A. C. Miller, president of the senate, proved able leaders in the legislative field.

The great Rushmore memorial in the Black Hills was completed by Lincoln Borglum who carried out the design of his sculptor father, Gutzon Borglum. The number of tourists passed the million mark, many drawn to the state by the Rushmore project.

Education.—The school census for 1941 was 182,542.

Communication.—On Jan. 1, 1939, there were 5,851 mi. of rural state highways, of which 4,932 mi. were surfaced. Expenditures in 1939 amounted to $6,685,000. On Jan. 1, 1939, there were 4,127 mi. of steam railways in the state.

Finance.—The state debt on June 30, 1941 was $41,436,000. Total receipts for the fiscal year 1940–41 were $32,665,669.46; disbursements were $29,934,593.42.

Agriculture.—South Dakota had its most successful crop season in a decade in 1941. The total value of all crops amounted to $127,000,000, as compared with $84,000,000 in 1940.

Principal Agricultural Products of South Dakota, 1941 and 1940

Crop	1941	1940	Crop	1941	1940
Corn, bu	41,700,000	50,112,000	Wheat, bu.	35,024,000	26,221,000
Oats, bu.	51,072,000	53,240,000	Hay, tons	2,085,000	1,650,000
Barley, bu	30,226,000	30,821,000			

Manufacturing.—Manufacturing continued to gain in 1941. The farm-to-town migration ceased but the state's population declined because of emigration to out-of-state defense areas. Principal industries were meat-packing, butter, bread and bakery products, printing and publishing, and poultry dressing.

Mineral Production.—Mineral production was valued at $24,811,231 in 1939 and $23,583,359 in 1938. By far the leading mineral was gold, valued at $21,648,760. Stone was valued at $998,444; sand and gravel, $722,046; raw clay, $217,622. (L. K. F.)

Southern Rhodesia: *see* RHODESIA.

South Polar Regions: *see* EXPLORATION AND DISCOVERY.

South Sea and Equatorial Islands. Howland island lies in the Pacific ocean, approximately 1,870 mi. southwest of Honolulu, in latitude 0°–48′–06″ N. It was surveyed in 1872 by the U.S.S. "Narragansett" and found to be about 2 mi. long, ½ mi. wide, 20 ft. above sea level at its highest elevation, of coral formation and with a fringing reef.

Baker island is in the Pacific ocean in latitude 0°–13′–30″ N., longitude 176°–28′–14″ W., approximately 1,880 mi. southwest of Honolulu, and within 13 nautical miles of the equator. It is of coral formation, about 1 mi. long east and west, and ¾ mi. wide, surrounded by a coral platform reef 200 to 400 ft. wide. Its highest point of elevation above sea level is 20 ft.

Jarvis island is in the Pacific ocean, approximately 1,500 mi. south of Honolulu, in latitude 0°–22′–37″ S., longitude 160°–01′–37″ W., 23 mi. south of the equator. It is of sand and coral formation, approximately 2 mi. long and 1½ mi. wide, and about 20 ft. above sea level at its highest point.

These three islands were settled in 1936, after having been uninhabited for many years. Representatives of the department of the interior placed four young Hawaiians on each island to maintain sovereignty of the United States and to obtain meteorological data essential to commercial aviation in the Pacific. United States citizens of Hawaiian ancestry were selected because of their adaptability to prevailing conditions and their proximity to the islands. The scarcity of vegetation and the absence of drinking water make it necessary to transport food, water and other supplies from Honolulu. This is accomplished by quarterly expeditions to the islands by coast guard cutters.

Canton island is the largest and most northerly of the Phoenix islands. It is approximately 1,850 mi. southwest of the Hawaiian group in latitude 2°–48′–58″ S., longitude 171°–42′–41″ W. It is a coral atoll containing a narrow strip of land varying from 50 to 600 yd. in width, enclosing a lagoon about 9 mi. long and 3 mi. wide at the west end. The rim varies in height from 10 to 20 ft. and is broken only by three or four lagoon entrances.

An air base has been established on Canton island by Pan American Airways in connection with its service from California to New Zealand. A hotel and other necessary facilities were now in operation, and regular aviation service was started with the first air mail flight from California on July 12, 1940. With the agreement of the state department, the interior department and the Civil Aeronautics authority, a member of the Pan American staff on Canton island has been designated acting field representative of the interior department, serving without compensation. The Hawaiian colonists were evacuated Oct. 8, 1940.

Canton and Enderbury islands are under the joint control of the United States and Great Britain, under an agreement com-

pleted in April 1939 between the two governments, providing for the common use of the islands for international aviation and communication for a period of 50 years. (G. J. S.)

So far as was known at the close of 1941, none of the islands in the South Sea and Equatorial group had been attacked by the Japanese.

South-West Africa: *see* MANDATES; SOUTH AFRICA, THE UNION OF.

Sovereigns, Presidents and Rulers: *see* PRESIDENTS, SOVEREIGNS AND RULERS.

Soviet-German Pact: *see* MOLOTOV, VYACHESLAV MIKHAILOVICH.

Soviet Republics: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Soviet Union: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Soybeans. U.S. production of soybeans in 1941 was estimated by the department of agriculture Nov. 1 as 111,300,000 bu. compared with 79,837,000 bu. in 1940 and a ten-year (1930–39) average of 35,506,000 bu. The preceding comparison indicates how soybeans advanced in a decade from the position of a minor U.S. forage crop to that of a highly important food and commercial crop. Soybean bread and meal and soybeans, roasted and salted as peanuts, have become common commercial products. Probably more than 100,000,000 lb. of soybean oil are used annually in the production of oleomargarine and cooking fats. Market activity in soybeans during 1941 frequently exceeded that of corn in trading on the Chicago Board of Trade—a fact that gains added interest when it is realized that corn is the United States' largest feed and food crop and that the nation's agriculture is basically a corn economy. Six states, listed in the accompanying table, produce the commercial soybean crop in the United States; their harvest in 1941 was 103,85°,000 bu. The remaining 7,442,000 bu. of the 1941 crop were grown in other states as a livestock feed and fertilizer crop. The United States in 1941 was second only to Manchoukuo in the production of soybeans. No 1941 figures were available from Manchoukuo and the Danube countries. In 1940, in response to inducements from the Japanese government, farmers produced 161,156,000 bu. of soybeans, compared with 144,952,000 bu. in 1939. Soybean meal is an important part of the German and other European army rations. Bulgaria increased its soybean acreage in 1941 owing to increased demand from Germany. Rumanian acreage also was increased to meet the growing European need for edible vegetable oils. The British blockade prevented the usual importations of vegetable oils and oilseeds from Africa and America, and the German-Russian war cut off Chinese and Manchoukuoan supplies, which previously to June 1941 had reached Germany via the trans-Siberian railway.

The U.S. acreage in soybeans in 1941 was 9,990,000 ac. compared with 10,528,000 ac. in 1940 and a ten-year average of 5,467,000 ac. The per-acre yield in 1941 was 18·8 bu. The 1940 yield and the ten-year average yield were the same, 16·1 bu. to the acre. The accompanying table gives the commercial production only and does not include that part of the crop grown in other states. (*See* also CHEMURGY.)

U.S. Soybean Production by States, 1941 and 1940

	1941 bu.	1940 bu.		1941 bu.	1940 bu.
Illinois	54,112,000	35,140,000	Ohio	12,800,000	8,400,000
Iowa	17,501,000	15,026,000	North Carolina	2,185,000	2,282,000
Indiana	15,436,000	10,989,000	Missouri	1,824,000	1,176,000

(S.O.R.)

SPAB: *see* SUPPLY PRIORITIES AND ALLOCATIONS BOARD.

Spain. A totalitarian state occupying eleven-thirteenths of the Iberian peninsula in extreme southwestern Europe. Area (including the Balearic and Canary Islands): 194,200 sq.mi.; pop. (official est. June 1940): 26,053,230 (1930 census: 23,563,867). Capital: Madrid (1,194,756). Other chief cities (pop. est. 1940): Barcelona (1,398,942), Valencia (403,126), Seville (253,203), Malaga (232,136), Bilbao (228,418). Language: Spanish. State religion: Roman Catholic. Caudillo, or chief of state: General Francisco Franco (*q.v.*).

History.—Problems of economic reconstruction continued to dominate the Spanish scene in 1941, as the government strove to keep out of war, although maintaining its close association with Germany and Italy and carrying on a propaganda campaign for imperialism in North Africa and for stronger ties with Spanish America. The general economic situation, while somewhat improved over 1940, was still far from satisfactory. Food shortages and higher prices brought distress to the poor, undernourishment increased disease, and unemployment continued widespread. To alleviate these conditions, the government negotiated for increased food imports and strengthened its control over economic activities. Contracts were made with Argentina and Brazil for the delivery of large quantities of wheat and cotton, and additional credits were obtained for purchases from Great Britain, whose blockade authorities allowed increased quotas to pass through in order to facilitate Spain's rehabilitation. In October, after numerous sentences to hard labour (estimated as high as 50,000 in 11 months) had failed to bring satisfactory observance of laws against profiteering and hoarding, the death penalty was decreed for those selling "prime necessities" at exorbitant prices. Transport facilities, whose inadequacy was closely linked with economic distress, were a special concern of the government, which on Jan. 28 assumed ownership and operation of standard-gauge railways and created a government commission to control all transport services. A law of May 5 raised shipping subsidies 20% to 25,000,000 pesetas annually. To ensure more efficient regulation of industry, the government authorized on June 23 the formation of 24 national syndicates embracing all productive, processing and service activities, and on Sept. 25 set up a National Industrial institute to promote and finance the creation and development of industries, as well as to direct all government participation in private business and to manage government-owned factories and equipment.

Meanwhile the Falange, a largely middle-class movement closely patterned after Italian fascism, continued to strengthen its position in relation to other factions supporting the Franco government (notably the conservative "traditionalist" element comprising the army, the church and the monarchists). The Falange's leader, General Franco, remained, in theory and largely in practice, the supreme authority of the state; its national council of 100 members constituted the legislative body, and its 19-man political junta, headed by Franco's brother-in-law, Foreign Minister Ramón Serrano Suñer (*q.v.*), served practically as the government cabinet. In March, Falange officials were granted the privileges and immunities enjoyed by officers of the state, the army and the church, and in October the party received control of all information services, including press, radio, films and government propaganda. A further entrenchment in power resulted from the growth of the Falange militia and from the regimentation, in accordance with a decree of Dec. 1940, of all Spanish youth for political and pre-military training under Falange direction. The death of ex-King Alphonso (*q.v.*) on Feb. 28, shortly following his renunciation of claims to the throne in favour of the Infante Juan, simplified the problem of restoring the monarchy, but such was clearly not the intention of the government, although Alphonso's death was observed with solemn mourning throughout Spain.

A signal victory over the church was won in May, when a concordat with the Vatican recognized the state's right to make appointments to Spanish bishoprics, of which nine metropolitan and 61 suffragan sees had become vacant.

For reasons of both self-interest and ideology, the Franco government continued in sympathy with the axis, but the disrupted economy, social cleavages and dependence upon anti-axis powers for needed supplies precluded active participation in the war during 1941. Over extreme partisans of the axis, General Franco exercised a moderating influence; in May he ordered a drastic government shake-up, replacing a number of Serrano Suñer's pro-axis supporters with close friends of his own. On Dec. 19, following the involvement of the United States and Japan in the war, the government reaffirmed its "nonbelligerency" policy adopted in June 1940. Pan-Americanism was vigorously combatted, as the government intensified its campaign for the revival of Spain's influence on her former American empire. The Consejo de Hispanidad (Council of Hispanism), projected in 1940 and given tangible form in 1941, directed relations with Spanish America, where it co-operated with local units of the Falange. With the outbreak of war between the axis and the United States, Spain generally took over German and Italian diplomatic relations with Spanish America, and indications were that the Falange might be preparing to assume the burden of axis propaganda there as well.

Education.—Primary education is compulsory and free, and religious instruction has been restored as in the period of the monarchy. Education shared with agriculture and public works a government appropriation of 882,000,000 pesetas in 1941.

Defense.—Military service is compulsory. The army is closely integrated with the Falange and was unofficially estimated in 1941 to include approximately 320,000 actives and 300,000 trained reserves. The air force, separate from the army, had about 3,500 actives and 5,000 reserves. The navy consisted of some fifty gunboats, submarines and torpedo boats; most major units were either sunk or severely damaged during the civil war. Appropriations for defense were slightly more than 2,100,000,000 pesetas for 1941.

Finance.—The monetary unit is the peseta (official value in 1941: 9.13 cents U.S.); the gold peseta (value 33 cents U.S.) is used in foreign transactions. Gold reserves were almost negligible, and the currency was artificially controlled. The 1940 budget, appropriating 7,160,000,000 pesetas, was continued for 1941; an additional 1,500,000,000 pesetas were appropriated in March. The funded public debt on Dec. 31, 1940, was unofficially estimated at 23,885,000,000 pesetas. Foreign indebtedness in June 1940 was 1,200,000,000 gold pesetas, exclusive of the debt to Germany of perhaps 300,000,000 marks. The total currency in circulation was 12,460,000,000 pesetas. No gold or silver reserves against paper currency were required.

Trade and Communication.—Official Spanish trade figures were not published to any extent after 1936. Statistics for 1940 showed exports valued at 394,335,325 gold pesetas ($128,839,000) and imports at 620,585,225 ($202,745,000). Exports to the United States were $14,550,093 and imports $27,041,820. Wheat and other foodstuffs were the major import item, while fruits and raw materials (chiefly oranges, nuts, olives, cork and its manufactures, iron ore and pyrites, mercury and naval stores) constituted the bulk of the exports. No figures were released for 1941, but the import surplus was believed to have been appreciably reduced; the trend of shipments could not accurately be determined. In the first eight months of 1941 imports from the United States ($10,994,946) were less than half the figure for the same period 1940 and only slightly exceeded exports, which remained at the 1940 level. A "favourable" trade balance was unofficially reported for Spanish commerce with Great Britain, Germany, Italy and France; but imports from Hispanic America exceeded exports, with large shipments being taken of Argentine wheat and of Argentine and Brazilian cotton.

In 1936, at the outbreak of the civil war, railways totalled 16,986 km. There were 3,830 locomotives, 6,866 passenger cars and 98,570 freight cars, but 27% of the locomotives, 22% of the freight cars and 61% of the passenger cars were lost during the civil war. Replacements were slow, and at the beginning of 1941 less than 3,500 locomotives were in operation, together with 4,500 passenger and 89,000 freight cars. Despite equipment deficiencies, 168,000,000 passengers were transported in 1940, a 65% increase over 1935, partly explained by the shortage of gasoline. Rail freight movement was estimated at 40,500,500 tons, about 5% over 1935. All standard-gauge lines (totalling 12,382 km., of which only 1,600 km. were of double track and only 630 km. electrified) were placed under government control. Private motor traffic was virtually eliminated, and bus and trucking services were greatly curtailed by the shortage of gasoline. Air traffic increased greatly in 1940, with both Spanish- and foreign-owned lines opening new and extending existing services. In 1941 a new 50,000,000-peseta airport was projected for Barcelona, an important air centre. In 1940, the merchant marine comprised 900 vessels, with a gross tonnage of nearly 1,100,000; a 12-year government program called for the addition of 700,000 tons. In July 1940, 3,257 telephone stations and 325,309 telephones were in operation, representing a substantial gain following the end of the civil war. Late in 1940 international telephonic communication was restored. Certain German- and Italian-owned cables were cut, but British-owned cable connections continued in operation, as did international commercial radio services.

IN SPAIN, IN 1941, CHILDREN as well as adults had to wait in line for their meagre rations since the lack of food grew more and more critical

Agriculture.—Agriculture is the chief industry, although less than half the arable land was under cultivation in 1941. Production in 1941 was estimated greater than in 1940, but crop yields were below average, largely because of lack of fertilizers, insecticides and equipment. Main crops, with estimates of 1941 production (in metric tons except where otherwise indicated), were: wheat, 2,980,000 (1931–35 average yield: 4,393,000); barley, 1,800,000; rye, 422,000; oats, 600,000; rice, 204,000; olives for oil (1940), 1,444,555 (1939: 1,150,191); olive oil, 340,000 (1940: 284,053); oranges, 450,000 (1940: 700,000); beet sugar, 150,000 (1940: 100,000); cane sugar, 10,300; cotton (1940), 7,700 bales of 478 lb.; potatoes (1940), 70,000; wine, 18,000,000 hectolitres. Cork strippings in 1940 amounted to 35,000 tons (normally 60,000).

Manufacturing.—Absence of both official and unofficial statistics precluded accurate judgment in 1941 as to the extent of manufacturing recovery. Production continued to be hampered by shortages of machinery and raw materials and by inadequacy of transport facilities. Output of all factories in 1940, although below 1930 levels, was estimated to exceed that of 1939. Iron production was 620,652 tons and steel was 758,682, equalling the high levels of 1929 and 1930. At the beginning of 1941 there were ten blast furnaces with an annual capacity of 1,000,000 tons. Cement sales of 1,470,000 tons represented a 27% gain over 1935. The munitions industry worked at capacity, and lumber production compared favourably with pre-civil war years. On the other hand, operations of the large canning, shoe and soap industries were seriously curtailed by lack of raw materials, which affected also the important cotton textile industry. Wool-textile production, although much greater than in 1939, was below pre-1936 levels. For the first half of 1941, iron production was about 257,500 tons (25,000 less than for the same period in 1940) and steel output 358,500 (about 30,000 less). Cement production for the first 8 months was 875,000 tons, slightly less than in 1940. Unemployment was large and widespread.

Mineral Production.—Mining is second to agriculture. Production was erratic because of economic dislocations brought on by the civil war and the world conflict, and reliable statistics were not available in all cases in 1941. Coal production in 1940 was 9,417,283 tons (an all-time high), and iron output was estimated at 2,886,973 tons. Official production statistics (in tons) for the first half of 1941 showed: coal, 4,552,000; iron 797,500; iron pyrites, 239,211; zinc ore, 42,752; zinc metal, 6,936; copper ore, 72,238; black copper, 596; blister copper, 1,562; refined copper, 3,493; copper metal, 4,251; manganese ore, 4,410; wolframite, 243; tin ore, 127; metallic tin, 42; lead ore, 25,241; pig lead, 7,088. (*See* also WORLD WAR II.)

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Spanish-American Literature.

The most striking feature of Spanish-American literature in 1941 was the number of good novels published during the year. In a broad generalization it may be said that most of these novels belong to the group of social works dealing

with the situation of the Indian peasant, the incipient industrial proletariat, the immigrant worker, and their specific problems. Ciro Alegría's *El mundo es ancho y ajeno* (which has been translated into English) is typical of this trend. Alegría is acutely conscious of the problem of the Indian land worker in Peru, deals with it from both a local and a human point of view which is intensely pathetic; it is a book well worth reading both as a work of art and as a social document for the better understanding of South America. Gonzalo Drago's *Cobre* is the novel of the workers of the foreign-owned copper mines of Chile, a realistic, violent book, a political pamphlet as much as a piece of fictional literature. Enrique Amorim's *El caballo y su sombra* presents a different facet of South American life; it is a study of the Uruguayan agricultural world portraying the conflict between the old latifundist and the newly arrived immigrant worker with his new ideas, methods and needs. In Ecuador, Gerardo Gallegos in his *Eladio Segura* presents an Andean novel, a psychological study of an ethnical group fatally predetermined, and Alfredo Pareja Díez Canseco in *Baldomera* offers his favorite theme of the impact of modern urban life on the Indian. Also dealing with Indian life is the Mexican National Prize in Literature *Nayar* by Miguel Angel Menéndez, the protagonist of which is a whole Indian tribe treated in a poetic, impressionistic mood, that almost escapes the rules of the novelistic genre.

Other good novels published in 1941 were: in Argentina, Bernardo Verbitsky's *Es difícil empezar a vivir*, first prize in the Ricardo Güiraldes literary competition, J. Carlos Onetti's *Tierra de nadie*, Renata Donghi Halperín's *El sol sobre las manos*, Juan Filloy's *Caterva*, excellent in psychology and brilliant in pathetic humour; and in Chile, Macedonio Fernández's *Una novela que comienza*, almost surrealistic in approach.

Minor works in the field of the novel were the Mexican Mauricio Magdaleno's *Sonata* which like his previous books ramblès off into exces ive lyricism after a good beginning; the Chilean Sofía Espíndola's *Sombra en llamas;* the Colombian Fernando González's *El maestro de escuela*, and the Salvadoran Trigueros de León's *Campanario*.

In the field of the short story, usually so good in Spanish-America, the year 1941 was not a happy one. Those deserving mention were: the Cuban Juan Bosch's *Dos pesos de agua*, a collection of dramatic, direct tales, simple in style; and Juan Draghi Lucero's *Las mil y una noche argentinas*, legends and tales of the Argentine West, the best of them being those taken from folk-lore. In passing we may mention also the Venezuelan Julián Padrón's *Candelas de verano*, the Chilean Oscar Castro's *Huellas en la tierra*, and the Mexican Efrén Hernández's *Cuentos*.

In the poetical production of 1941 Mexico took the lead with the publication of Xavier Villaurrutia's *Décima muerte y otros poemas no coleccionados* in which that profound and difficult poet stirs the deepest intellectual emotions of the reader, with Alfonso Reyes' delicate offering *Algunos poemas* (*1925–1939*) and with the great Enrique González Martínez's *Poemas truncos*.

In Argentina we find a book of *Coplas* by Antonio de la Torre, the best of his poems being those of popular and regional flavour; Luis Cané's *Bailes y coplerías* are good verses; also Mario Binetti's *La sombra buena*. The Cuban poet Mariano Brull published a book of verse *Solo de rosa*.

In Chile were published Stella Corvalán's *Sombra en el aire*, Washington Espejo's *Canto perdido*, Roberto Meza Fuentes' *Arbol de Navidad*, and a collection of poems by the creationist writer Vicente Huidobro *Ver y palpar, 1923–1933*.

The distinguished Ecuadorian poet Jorge Carrera Andrade printed his *Canto al puente de Oakland*, the Uruguayan Sara de Ibáñez an excellent book *Canto*, and Roberto Brenes Mesén, from Costa Rica, offered an anthology *En busca del Grial* of his previous books of verse.

Anthologies of national poetry were Rafael Heliodoro Valle's *Indice de la poesía centroamericana*, Juan Felipe Torruño's *Indice de poetas de El Salvador en un siglo, 1840–1940*, Rodrigo Miró's *Indice de la poesía panameña contemporánea*, and Guillermo Viscarra Fabre's *Poetas nuevos de Bolivia*. These are all interesting to the student of Spanish-American literature.

A book by Antonio Castro Leal must be mentioned, *Salvador Díaz Mirón. Poesías completas: 1876–1928* in which are included some forty poems by the author of *Lascas* which were either unknown or never before printed in book form.

The essay literature in Spanish-America in 1941 was important in the number as well as in the range and value of the works published. Not a few writers covered in substantial writings the economic, social and political problems of present day Spanish-America and of the world, probed into the past, studied questions of import in philosophy, aesthetics, literary and historical criticism.

Nothing more than a brief mention of some of these works is possible here. In Argentina were published Pablo Rojas Paz's *Alberdi*, Héctor P. Agosti's *El hombre prisionero*, José Gabriel's *Aclaraciones a la cultura*, Leopoldo Hurtado's *Espacio y tiempo en el arte actual*, Dr. Alejandro Raitzin's *Cultura, carácter y conducta*, Marcos M. Blanco's *Este vuelco del mundo*, Juan Pinto's *Panorama de la literatura argentina contemporánea*, Amado Alonso's *Poesía y estilo de Pablo Neruda*, María Rosa Lida's *El cuento popular hispanoamericano y la literatura;* in Cuba, Enrique Labrador González's *Manera de vivir* and Armando Guerra's *La mujer vueltabajera en la poesía cubana;* by Chilean writers we have Prof. Arturo Torres Rioseco's *Novelistas contemporáneos de América*, Andrés Sabella's *Crónica mínima de una gran poesía* and several books published on the occasion of the City of Santiago centennial such as Ricardo A. Latcham's *Estampas del Nuevo Extremo;* in Ecuador, Alejandro Andrade Coello's *La novela en América. Sus raíces* and Luis Bossano's *Los problemas de la sociología*. In Mexico, that master of the essay, Alfonso Reyes, published *Pasado inmediato y otros ensayos*.

By Peruvian writers were printed *Cien años de literatura y otros estudios críticos* by Prof. José Jiménez Borja, *Balance y liquidación del 900* by Luis Alberto Sánchez, and *Hombres e ideas en el Perú* by Jorge Guillermo Leguía. The distinguished Uruguayan philosopher published a new book *Fermentario*. And in Venezuela we find *Formación y proceso de la literatura venezolana* by Mariano Picón Salas, Alejandro Rivas Vázquez's *Orientaciones americanas*, and José Gil Fortoul's *El hombre, la historia y otros ensayos*.

(L. Mo.)

Spanish Colonial Empire. Total area (approx.) 128,100 sq.mi.; total population (est. Dec. 31, 1939) 1,005,000.

The table below lists the colonies, protectorates, etc., of Spain (*q.v.*) with certain essential statistics appropriate to each of them.

Spanish Colonial Empire

Colony and Area sq.mi. (approx.)	Population Estimated Dec. 31, 1939 (000's omitted)	Capital, Status, etc.	Principal Products (in metric tons)	Imports and Exports (in thousand pesetas)	Road, Rail and Shipping	Revenue and Expenditure (in thousand pesetas)
AFRICA Ceuta and Melilla, 77	115	Madrid, administered as part of Spain	exports (1934) raw materials 899,553, manufactures 12,892	(1934) imp. 47,546 exp. 14,500		
Morocco, Spanish, 8,080	750	Tetuan, protectorate *High Commissioner:* General Carlos Asensio	(1938) iron ore (metal content) 805,000; (1938) antimony ore (metal content) 81	(1938) imp. 123,146 exp. 71,143	rds. *c.* 500 mi. rly. 80 mi.	(1938) rev. and exp. 111,785
Spanish Guinea, including Fernando Po, Rio Muni and four small islands, 10,380	120	Santa Isabel, colony	(1934–35) cocoa 14,900 coffee	(1930) imp. 17,625 exp. 21,970		(1932) rev. and exp. 11,020
Western Sahara, including Ifni, Rio de Oro and Spanish Sahara, 109,600 . .	20	Villa Cisneros, colonies	fish and dates			(1929) rev. and exp. 6,947

Spanish Guinea: *see* SPANISH COLONIAL EMPIRE.

Spanish Literature. Even by 1941 Spain had not recovered sufficiently from the civil war to produce many books of note since early in 1939. In fiction, Concha Espina was still prolific with *Esclavitud y libertad* and *La Ronda de los galanes,* as was W. Fernandez Flórez with *El Hombre que compró un automóvil* and *Una Isla en el Mar Rojo.* José María Pemán published a drama, *La Danza de los velos,* and a collection of essays, *Crónicas de antes y después del Diluvio.* Under belles-lettres come also E. Giménez Caballero's *El Vidente* and J. de Entrambasaguas' *El Alma Sorprendida.* The late Cardinal Gomá published in 1940 a volume entitled *Por Dios y por España.* Sr. Menéndez Pidal published the third volume of his monumental *Historia de España.* Another substantial historical work was J. García Mercadal's *La España Imperial: Cisneros.* Miguel Artigas' *La Vida y la obra de Menéndez Pelayo* was being followed by a new edition of Menéndez Pelayo's complete works, and the Instituto de España was editing a series of anthologies from them.

Outstanding political works were R. Gay de Montellá's *El Fuero del Trabajo y sistema del Estado sindical-corporativo;* I. Serrano's more substantial treatment of the same subject in *El Fuero del Trabajo. Doctrina y comentarios;* and *Cuatro Estudios sobre sindicalismo vertical* by L. Legaz Lacambra and B. Aragón Gómez. L. Gabilán Plá and W. D. Alcahud edited the text of all measures passed by the nationalist government down to the end of the civil war (April 1, 1939: *Legislación Española,* 6 vols.). Manuel Aznar published a comprehensive *Historia Militar de la Guerra de España.* A biography of chiefly political interest was Aurelio Joaniquet's *Calvo Sotelo.*

Several notable books by Republican exiles abroad appeared in English: S. Casado, *The Last Days of Madrid;* S. de Madariaga, *Christopher Columbus;* J. Alvarez del Vayo, *Freedom's Battle;* A. Barea, *The Forge.* Among such works in Spanish were: E. Díez-Canedo, *El Teatro y sus enemigos;* Alfonso Reyes, *Capítulos de literatura española;* José Moreno Villa, *Locos, Enanos, Negros y Niños palaciegos;* Adolfo Salazar, *Música y sociedad en el Siglo XX;* Maria Zambrano, *Pensamiento y poesía en la vida española.* Spaniards in Mexico founded a monthly review, *España peregrina.* Catalonians in Paris revived the *Revista de Catalunya* and founded a new weekly, *El Poble Català.* The *Revista de Filología Española,* an offshoot from which was the new Argentine *Revista de Filología Hispánica,* recommenced publication in March 1941. A new literary review of outstanding quality, *Escorial,* made its first appearance in the autumn of 1940. (E. A. P.)

Spanish Morocco: *see* SPANISH COLONIAL EMPIRE.
Spanish West Africa: *see* SPANISH COLONIAL EMPIRE.

Special Libraries Association. Founded in 1909 to further the purpose of special libraries in business and industrial organizations, and to promote the collection, organization and dissemination of information; to develop usefulness and efficiency of special libraries and other research organizations; and to encourage the professional welfare of its members. As of Sept. 30, 1941, the association had 2,490 members in the United States and Canada. These members represent banking, advertising, insurance, finance, publishers, manufacturers, museums, specialized departments of colleges and universities and business branches of public libraries. The official journal, *Special Libraries,* is published monthly September to April, with bimonthly issues May to August. The association has 18 chapters in the United States and two in Canada. An annual convention is held each year in June. The association carries on a publications program which is professional in character. *Special Library Resources,* vol. I, was published in 1941.

The 1941–42 officers were: president, Laura A. Woodward, Maryland Casualty company, Baltimore, Md.; first vice-president, Josephine B. Hollingsworth, Municipal Reference library, Los Angeles, Calif.; second vice-president, Gladys R. Haskin, Cleveland School of Art, Cleveland, O.; treasurer, Marcella Hasselberg, Curtis Publishing company, Philadelphia, Pa. Directors: Ross C. Cibella, Hall Laboratories, Inc., Pittsburgh, Pa. (term expiring 1942); Harry C. Bauer, Tennessee Valley authority, Knoxville, Tenn. (term expiring 1943); Herman H. Henkle, School of Library Science, Simmons college, Boston, Mass. (term expiring 1944); Alma C. Mitchill, Public Service corporation of New Jersey, Newark, N.J. (term expiring 1942); national secretary, Mrs. Kathleen B. Stebbins, 31 East Tenth st., New York city. Executive office, 31 East Tenth st., New York city. (K. B. S.)

Spelman Fund of New York was chartered in 1928. The fund, during 1941, continued its program directed at the improvement of the methods and techniques in the field of public administration. During the year, the fund appropriated $787,500. The chairman of the Board of Trustees in 1941 was Charles E. Merriam. (C. MH.)

Spices. During 1941 attempts were made to grow herbs and spice seeds in the U.S. Sage is a favourite, particularly for seasoning pork products. But it grows in Yugoslavia and war prevented exports in 1941. From Oregon to Massachusetts farmers became interested in sage with dubious results. Better were the reports on red peppers and mustard seed, the latter crop yielding more tons than ever before. Moderate acreages of coriander and blue poppy seeds were harvested, proving they can be raised in the U.S. Where machinery cannot be applied, differences in production costs are startling. U.S. growers would be unhappy with a price of 40 cents per lb. for sage leaves against 6 cents per lb. (New York), at which price the Yugoslavs would be eager sellers.

Fewer steamers were available to bring spices to the U.S., and consequently freight rates advanced and reserve stocks diminished. Ensuing higher prices were without appreciable effect on living costs. The per capita annual use of imported spice is under 14 oz., with a 1941 retail value of about 1 cent per week. During the summer of 1941 trading with Japan ceased, cutting off the small red peppers (hontakas) seen in jars of pickles and chow chow; also a useful variety of mustard seed from occupied China and Japanese ginger. The supplies of Holland caraway and blue poppy in the U.S. were near the vanishing point. But blue poppy seed was again found in Turkey, emerging by way of Izmir or Basra. As tension in the Pacific fluctuated, prices for Netherlands-Indian, Malayan and Indian spices swayed between the advances already attained and a still higher range. The 1941 black pepper crop attracted little attention, but was normal. Ships were needed to move it, but rubber and tin had priority. There remained, however, enough pepper in the U.S. in 1941 to cover requirements until 1944. The countries of South and Central America were buying spices in the U.S. This new export business increased.

Imports of Spices by the U.S.A., Jan.-July 1940 and Jan.-July 1941

	7 mo., 1940		7 mo., 1941	
	Quantity, lb.	Value	Quantity, lb.	Value
Capsicum; red or cayenne peppers; chili, unground	1,204,463	$ 130,468	2,996,616	$ 278,542
Caraway seed	3,103,608	330,829	108,298	18,335
Cardamom seed	190,514	110,906	320,272	230,587
Cassia and cassia vera	6,101,438	582,085	7,516,436	808,597
Celery seed	916,495	99,152	437,599	84,672
Cinnamon, unground	601,614	80,534	1,853,312	232,380
Cloves, unground	3,130,240	431,830	6,397,837	831,155
Ginger root, unground	712,793	20,814	3,158,713	208,127
Mace, unground	517,855	180,799	726,543	180,753
Mustard, ground	761,789	347,152	520,056	223,176
Mustard seed, whole	4,003,555	253,650	3,486,134	186,673
Nutmegs, unground	2,940,630	358,998	4,787,183	501,038
Paprika, ground	2,066,415	582,630	3,160,537	743,193
Pepper, black, unground	10,388,184	373,562	27,714,088	1,121,908
Pepper, white, unground	2,192,208	173,922	6,966,665	466,198
Pimento (allspice)	895,805	120,238	1,891,871	299,940
Tonka beans	176,533	196,216	303,720	191,402
Vanilla beans	962,873	3,571,505	724,840	3,746,600
All other spices	4,549,713	271,841	10,728,089	828,636
Totals	46,406,725	$8,235,131	83,798,809	$11,181,912

Hungary and Bulgaria no longer shipped anise, paprikas and fennel seeds to the U.S. Test planting of paprika in the Gulf states and California in 1940 was inconclusive. It led to a larger effort in 1941, the protective duty of five cents per lb. being a real incentive. With the subjugation of France, northern India supplied the celery seed. Total imports in 1941 were 60% less than in 1940. Imports of nutmegs increased, at slightly reduced cost, there being but one market, the U.S. Gingers advanced sharply because of the difficulty of getting the 1941 main crop out from Sierra Leone. Madagascar adhered to the Vichy French government and could not obtain navicerts for its cloves and vanilla beans, leaving Zanzibar in a monopolistic position as to the former. Zanzibar wisely refrained from extreme price advances. Allspice (grown only in Jamaica, B.W.I.) touched a new high price as its manipulators perfected their technique. The usual reaction was observed—a rush to substitutes, principally a berry from Mexico (Eugenia tabasca), with a pronounced bay rum fragrance, something new for foods.

The heavy buying of the U.S. armed services had some effect on prices and supplies. (C. A. T.)

Spirits: *see* LIQUORS, ALCOHOLIC.

Sports and Games: *see* AIR RACES; ANGLING; ARCHERY; AUTOMOBILE RACING; BADMINTON; BASEBALL; BASKETBALL; BILLIARDS; BOWLING; BOXING; CHESS; CRICKET; CURLING; CYCLING; FENCING; FOOTBALL; GLIDING; GOLF; HAND-BALL; HORSE RACING; ICE HOCKEY; ICE SKATING; LACROSSE; MOTORBOAT RACING; POLO; ROWING; SHOWS; SOCCER; SOFTBALL; SQUASH RACQUETS; SWIMMING; TABLE TENNIS; TENNIS; TRACK AND FIELD SPORTS; TRAP-SHOOTING; WRESTLING; YACHTING.

Spotted Fever: *see* BACTERIOLOGY; MEDICINE.

Squash Racquets.

Charles Brinton, a Princeton undergraduate, won the national amateur and national intercollegiate singles titles in 1941. His brilliant playing was the outstanding feature of the season. Brinton, in capturing the national crown that was defended by A. Willing Patterson, vanquished Hunter Lott of Philadelphia in the final after eliminating such fine players as Neil Sullivan and H. Sherman Howes. The doubles combination of Hunter Lott, Jr., and William E. Slack won the national title for the fourth successive year, defeating the team of Brinton and Stanley Pearson in the semi-finals.

The United States team won the Lapham cup, emblematic of international squash racquets team supremacy, by defeating a Canadian team in a 15-match series. Canada won the cup in 1939 and 1940. In the 19 years the cup was up for competition the U.S. won it 12 times.

In the New York state championship, Stanley Galowin, who put out Patterson in the national, annexed the title for the third year in a row, vanquishing Donald Frame of the Harvard club of New York. Richard S. Rothchild of the Downtown A. C. (N.Y.) won the Metropolitan (N.Y.) Squash Racquets association singles championship by defeating Arthur H. Barker in a match that required less than an hour to play, with Rothchild the dominating figure.

Joe Janotta, of Chicago, won the National Veterans' honors, and Murray Vernon, of the Downtown A. C., captured the Metropolitan Veterans' title.

In women's competition, Miss Cecile Bowes, of Bala-Cynwyd, Pa., retained the national title, defeating Mrs. Enos Throop, Jr., of New York, the 1941 Metropolitan champion, in the final in 15 min. playing time.

Miss Eleonora Sears, a former national title holder, lost out in the quarter finals. (J. B. P.)

Stainless Steels: *see* METALLURGY.

Stalin, Joseph Vissarionovich

(1879–), Russian statesman, was born in Georgia and succeeded Lenin as virtual dictator of the soviet union in 1924 (see *Encyclopædia Britannica*). On May 6, 1941 Stalin assumed the premiership of the U.S.S.R. after the resignation of Vyacheslav Molotov (*q.v.*) from that office.

After the German invasion began June 22, 1941, Stalin, emerging from his accustomed seclusion of former years, made a number of public appearances and addresses. His new role in this respect was not unlike the relationship of the Tsars to Russian peasanthood in pre-revolutionary days. On July 3, in one of his rare radio addresses, he exhorted his people to "know no fear," to scorch the earth before the German advance. On July 19 he took over the post of defense commissar. On Oct. 19 he called upon all Muscovites for a last-ditch fight to save the capital. To the British on Nov. 6 he addressed a request for a second front in western Europe to hasten Germany's defeat. To the Americans on the same day he tendered his thanks for lend-lease aid. Previously Stalin had declared that "our war for the freedom of our country will merge with the struggle of the peoples of Europe and America for their independence and for democratic liberties." (*See* also UNION OF SOVIET SOCIALIST REPUBLICS.)

Stamp, Josiah Charles Stamp,

1ST BARON, OF SHORTLANDS, (1880–1941), British economist and banker, was born June 21 in London. In 1896 he started work as a lowly clerk in the inland revenue department; 40 years later he was one of the most powerful figures in British finance. During his lifetime he served as economic adviser on various government committees, was a director of the Bank of England and was chairman of the board of the London, Midland and Scottish railways. Lord Stamp exerted a powerful influence on British foreign policy during the critical years preceding the outbreak of World War II and he actively supported Neville Chamberlain's efforts to appease Hitler. A charter member of the Anglo-German fellowship, he attended the annual nazi party rally in Nuremberg in 1938 as Hitler's special guest. His pro-nazi leanings were overlooked when Britain went to war and he was appointed chief economic adviser to Chamberlain's war cabinet in Oct. 1939. Widely recognized as one of Britain's leading economists, he wrote many books and articles on economic subjects. Lord and Lady Stamp and their eldest son, the Hon. Wilfred Carlyle Stamp, were killed April 16 when German bombs crashed through their London home. (See *Encyclopædia Britannica.*)

Stamp Collecting: *see* PHILATELY.

Standards, National Bureau of.

The National Bureau of Standards was established by act of congress March 3, 1901. It was originally under the treasury department, but in 1941 was a bureau of the department of commerce. Its functions were the development, construction, custody and maintenance of reference and working standards used in science, engineering, industry and commerce. The bureau's services were available to the national and state governments, and under certain conditions to private firms and individuals. It acted as the principal testing laboratory of the federal government in connection with the purchase of supplies (other than food and drugs), and conducted research in co-operation with governmental agencies and with engineering societies and trade associations.

The bureau was made up of nine scientific and technical divisions, and three dealing with commercial standardization, as follows: electricity, weights and measures, heat and power, optics, chemistry, mechanics and sound, organic and fibrous materials, metallurgy, clay and silicate products, simplified practice, trade standards and codes and specifications. Each division consisted of from four to ten sections, which were the working units covering specialized fields.

On June 30, 1941 the bureau's staff consisted of 1,204 em-

ployees (including temporary appointees) and 80 research associates. The regular appropriation for the fiscal year 1941 was $2,037,500. In addition, $100,000 was provided for enlarging the optical glass plant and $21,000 for fencing the bureau's property and for employing additional guards. A tract of 12.5 ac. adjoining the bureau's property on the west and north was added to the site, which then comprised 67.8 ac. A new materials' testing laboratory was to be erected on this land, and plans for the building were being prepared in 1941.

During 1941 a large percentage of the bureau's work was connected with the defense program. Since the development of mechanized warfare has vastly increased the importance of uniform standards and precise measurements in the manufacture of military equipment, the bureau, as custodian of the national standards, has been called upon for many tests of materials and devices and for the investigation of new production processes.

The wide experience of the bureau's staff proved of great value to the army, navy, the National Advisory Committee for Aeronautics and the National Defense Research committee in solving many problems connected with the properties of materials and the design of equipment for service under unusual conditions.

In spite of the large volume of this military work, the bureau continued to serve American industries and the public in other fields. For instance, the standard frequency broadcasting service was improved by introducing accurate timing of the announcements which are given every five minutes on the continuous 440-cycle transmission. Plans were prepared for a new and improved transmitting station to replace the temporary one in use.

In co-operation with the Textile foundation, fundamental data were published on the properties of wool and other fibres. The availability of this information makes possible the development of new and more durable fabrics.

Working with the Copper and Brass Research association and the Federal Housing administration, tests were completed which gave, for the first time, accurate information on the strength of soft-soldered joints in thin-walled copper tubing, so extensively used in domestic plumbing installations.

A program of vehicle scale testing in co-operation with the states was completed ahead of schedule. Tests were made with the bureau's equipment in every state that did not have adequate facilities. The results of this were of such importance that 15 additional states had suitable testing equipment in order to maintain a continuous service.

The work on building materials and structures included tests of prefabricated units, wallboard, heating plants and other equipment. A survey of roofing materials in the north central states was completed, and a third report was issued giving results of the latest wear tests of floor coverings. Results of fire tests on many types of partitions, giving their effectiveness as fire barriers, were included in a report which should prove valuable to architects, engineers and building inspectors.

Two experts from the bureau's radio section accompanied the Louise A. Boyd Arctic expedition which sailed from Washington in the schooner "Effie M. Morrissey" on June 11, 1941. The expedition was to secure data on ionosphere conditions, geomagnetism and auroral phenomena, all of which have an important bearing on long-distance radio transmission. The United States coast guard and the Carnegie Institution of Washington co-operated with the bureau in developing the program and in providing instruments.

A complete report of the bureau's work to date on the physical properties of dental materials was prepared and was in course of publication in 1941. The report covered the beginning of its work at the request of the war department in 1919, the co-operative period with the Weinstein Research laboratories and finally the extensive program of the research commission of the American Dental association.

Several important meetings were held under the bureau's auspices, including the 31st national conference on weights and measures, the 19th annual conference of state utility commission engineers and the usual spring meeting of the American Physical society.

The bureau continued to aid the treasury department in the preparation of new and revised federal specifications, with particular emphasis on the use of substitutes for strategic materials. Purchasing agents for states, counties and municipalities were supplied with lists of manufacturers who certify that their products meet the requirements of nationally recognized specifications.

The new simplified plumbing code was widely used in 1941 in connection with federal housing projects. The national electrical safety code was thoroughly revised under bureau sponsorship. The report of the Interdepartmental Screw Thread committee was also revised and prepared for printing. (L. J. Br.)

Stanford University (The Leland Stanford Junior university). An institution of higher learning at Stanford university, Calif. (near Palo Alto), which in 1941 celebrated the 50th anniversary of its founding. In June a number of outstanding scholars participated in a symposium on "The University and the Future of America." In October thousands of Stanford alumni returned for exercises memorializing those held at the time of the opening of the university in 1891. The Hoover Library on War, Revolution and Peace was formally dedicated, with former President Herbert Hoover taking part in the program. "Birthday" gifts totalling $1,572,251.76 were received.

Under a $65,000 grant from the Rockefeller foundation, Dr. Ladislaus Marton, designer and builder of the first biological electron microscope, was brought to Stanford to develop and improve this new and important scientific tool. The school of engineering offered special courses in the summer quarter, various new defense training courses were initiated and the laboratories of the university took part in research projects on defense assigned by the federal government. Significant studies were made of poliomyelitis, epilepsy and cancer. With the increasing war tension and the expansion of the U.S. army and navy, a considerable number of the men of the university went into the armed forces or into war industry; but the number of women remained practically stationary. The faculty for the autumn quarter of 1941 numbered 617; the students, 4,077, of whom 1,347 were women and 917 were graduates. (R. L. W.)

Stang, Fredrik (1867–1941), Norwegian statesman, educator and jurist, became professor of law at Oslo university in 1897 and was president of the university from 1921 to 1927. He founded the Institute of Comparative Research in Human Culture, Oslo, in 1923, and headed that institution until his death. Stang was a member of the Norwegian Storting, 1906–09, and minister of justice, 1912–13. In 1914 he became a member of the Storting's Nobel committee, serving as its president after 1922. He died in Oslo, Nov. 15.

Stark, Harold Raynsford (1880–), U.S. naval officer, was born at Wilkes-Barre, Pa., on Nov. 12. Graduated from the U.S. Naval academy in 1903, he was commissioned ensign two years later and served on various ships and at various naval stations from 1903 to 1917. During World War I he was on the staff of Admiral William S. Sims, commander of the U.S. naval forces in European waters. He was chief of the naval bureau of ordnance from 1934 to 1937. On March 15, 1939 he was appointed chief of naval operations with the rank of admiral. After this appointment he was persistent in his pleas for a larger U.S. fleet and appeared a number of times before congressional committees to urge, usually with success, larger appropriations. In the spring of 1941 he announced his support of the lend-lease bill and of U.S. convoys in the Atlantic. On April 29 he revealed that U.S. patrols were already operating 2,000 mi. at sea. Stark was present with other ranking U.S. naval and army officers at the "Atlantic charter" meeting between Churchill and Roosevelt in August. The functions of his office were apparently altered by the shake-up of high naval personnel which followed the Japanese attack on Pearl Harbor in December. When Admiral Ernest J. King (*q.v.*) was appointed commander-in-chief of the U.S. fleet Dec. 20, he was made directly responsible to the president and secretary of the navy rather than to the chief of naval operations.

Stars: *see* ASTRONOMY.
State, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.
Steamships: *see* SHIPBUILDING.
Steel: *see* IRON AND STEEL.
Stellar System: *see* ASTRONOMY.

Stettinius, Edward R., Jr. (1900–), U.S. industrialist, born Oct. 22 at Chicago, Ill., and educated at the University of Virginia, where he was a student from 1919 to 1924. The son of a wealthy father, he went to work in 1924 as a common labourer with General Motors corporation. Within six years he was assistant to the president and in 1931 he was vice-president. In 1936 the U.S. Steel corporation made him chairman of its finance committee.

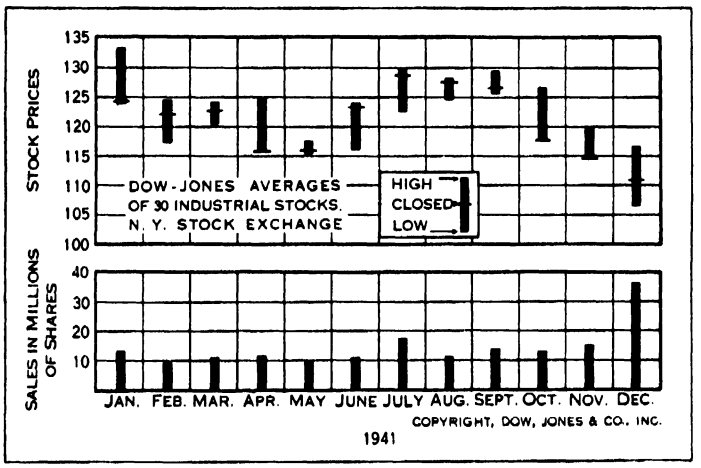
an important office theretofore reserved ordinarily for men with long years of experience as business executives. In April 1938 he was named chairman of the board of "big steel." Meanwhile he had served as liaison officer between the NRA and the Industrial Advisory board. In the fall of 1939 he was named director of the short-lived War Resources board, an agency appointed to formulate industrial mobilization in case of war. On May 28, 1940 President Roosevelt made him commissioner of industrial materials for the national defense council—a full-time job. In the Office of Production Management (*q.v.*), created Jan. 7, 1941, Stettinius became director of the important division of priorities, in which position he was succeeded Aug. 28, 1941 by Donald M. Nelson (*q.v.*). On the same day, Stettinius was appointed lend-lease administrator to succeed Harry L. Hopkins (*q.v.*). He was made special assistant to the president on Sept. 16 and was given the authority to approve all individual lend-lease allocations of less than $300,000,000. When aid to the Allies was consolidated under the Office of Lend-Lease Administration (*q.v.*) Oct. 28, Stettinius was named head of the new office with blanket powers to approve disbursements.

Stiles, Charles Wardell (1867–1941), U.S. medical zoologist, was born May 15 in Spring Valley, N.Y. He was assistant surgeon general of the U.S. public health service from 1919 to 1930 and was medical director of that service from 1930 to 1931. Dr. Stiles was the first to discover hookworm in the United States. He carried on extensive research among the poor in the southern states and found that their seeming laziness was largely due to this apparently insignificant parasite. He was a lecturer at Johns Hopkins university from 1897 to 1937; zoologist of the U.S. public health service from 1902 to 1910; professor of zoology at Rollins college from 1932 to 1938, and was associated with the Rockefeller Commission for the Eradication of Hookworm Disease from 1909 to 1914. He wrote widely on medical zoology and parasites of men and animals. One of his latest contributions was the *Early History of the Hookworm Campaign in Our Own Southern United States* (1939). He died Jan. 24 in Baltimore.

Stimson, Henry Lewis (1867–), U.S. statesman, of whom a biographical sketch appears in *Encyclopædia Britannica*. A Republican, he became an ardent admirer of Cordell Hull's policies as secretary of state (the office Stimson had held in Pres. Hoover's cabinet) and was always quick to defend Hull's actions against criticism. He favoured in particular a strong stand for the United States against Japan, Germany and Italy. Pres. Roosevelt appointed him secretary of war on June 20, 1940, the day Harry H. Woodring, resigned the office. Like his fellow cabinet-member, Frank Knox (*q.v.*), Stimson favoured a militant foreign policy in 1940 and 1941. He was among the first to support the lend-lease bill, revision of the neutrality act to permit U.S. convoys, extension of selective service and removal of the ban on the use of U.S. troops outside the western hemisphere.

Stock Exchanges: *see* STOCKS AND BONDS.

Stocks and Bonds. **Stocks:** *Nature of the Price Movements.*—Despite the existence of world war conditions, with the United States a participant, 1941 stock market movements were extremely small. In fact, the market in most important groups of stocks was surprisingly steady, at an extremely low price level, throughout the year. For nearly all groups of stocks, the price level sank gradually but not extensively from January to May; thereafter rose moderately until



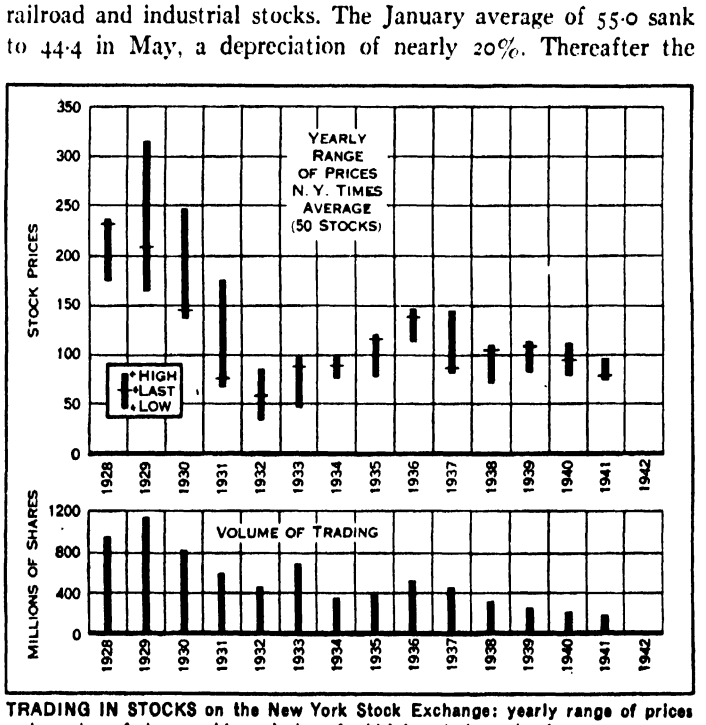
SALES AND PRICES on New York Stock Exchange, 1941

July; from July to year-end there was a gradual decline.

Using the Standard & Poor's barometer figures (average for each month based on daily closing prices), the average monthly price of 20 representative railroad stocks stood at 29·8 for Jan. 1941, as compared with 28·4 and 31·2 for December and January of 1940. Thereafter a slight decline occurred until June, when the monthly average stood at 28·7. The steadiness of the market for railroad shares, however, is indicated by the monthly averages of 28·4 for February, 28·7 for March, 29·0 for April, 28·7 for May and 28·7 for June. For July the monthly average rose to 30·0; it was 30·3 for August, 29·4 for September, 28·6 for October and 27·8 for November. In Dec. the average dropped to 24·9.

In the field of industrial stocks, using the Standard & Poor's average for 50 leading issues, the average monthly price stood at 102·6 for Jan. 1941, as compared with 103·0 and 119·0 for December and January of 1940. Following January of 1941, the monthly average sank gradually and moderately until May, when the monthly average price stood at 92·4. After May the average again rose to 101·7 for September, and then dropped to 88·2 for December, the low of the year.

Similar price movements by months occurred in other leading groups of stocks like the public utility, and copper and brass groups, although in each case the movement was somewhat larger. Public utility stocks fared rather adversely as compared with railroad and industrial stocks. The January average of 55·0 sank to 44·4 in May, a depreciation of nearly 20%. Thereafter the



TRADING IN STOCKS on the New York Stock Exchange: yearly range of prices and number of shares sold, exclusive of odd-lot and stopped sales

average price rose to 45·9 for July, and after that time there was a decline to 34·3 for December, or a decline of 38% since the first of the year. The December average of 34·3, it should be stated, compares with 70·4 for January of 1940. The copper and brass stocks monthly average price stood at 86·9 for January of 1941, at 83·4 for May, at 94·1 for July and at 82·4 for December.

Table I.—*Security Market Prices*

Month	Railroads 20 stocks		Industrials 50 stocks		Public Utilities 20 stocks		Copper and Brass 7 stocks		90 stocks	
	1940	1941	1940	1941	1940	1941	1940	1941	1940	1941
Jan.	31.2	29.8	119.0	102.6	70.4	55.0	134.8	*86.0	97.7	83.8
Feb.	30.9	28.4	118.3	96.1	69.9	51.4	131.7	*80.1	98.0	78.5
March	31.4	28.7	119.1	96.9	67.6	50.6	138.0	*81.1	97.3	79.0
April	31.2	29.0	119.0	93.9	68.7	47.6	137.2	*78.5	97.4	76.5
May	26.4	28.7	102.4	92.4	60.4	44.4	117.6	*83.4	84.0	74.9
June	22.1	28.7	93.0	96.2	56.8	44.9	99.3	*88.3	76.8	77.5
July	26.3	30.0	95.1	101.5	61.7	45.9	92.3	*94.1	79.4	81.5
Aug.	26.9	30.3	97.5	101.0	61.1	45.2	97.8	*93.2	81.0	81.1
Sept.	28.8	29.4	102.2	101.7	60.9	44.6	107.5	*90.8	84.4	81.3
Oct.	29.4	28.6	103.5	97.7	59.8	42.1	113.2	*83.4	85.2	78.0
Nov.	31.1	27.8	110.7	93.8	58.9	37.9	124.5	*82.7	90.2	74.4
Dec.	28.4	24.9	103.0	88.2	53.8	34.3	125.7	*82.4	83.7	69.5

*1941 copper and brass figures use 1935–1939 as a base period. All other figures use 1926 as a base period.
The above figures are an average for the month based on daily closing prices, except for copper and brass, which are weekly prices.
(Source of data: Standard & Poor's *Trade and Securities, Current Statistics.*)

Combining all of the aforementioned groups of stocks (ninety representative shares), the market showed a decline from 83·8 for January to 74·9 for May, and then an increase to 81·3 for September, and subsequently a decline to 69·5 for December, the low of the year and a decline of almost 17%.

At the close of Jan. 1941, the market value of all listed shares on the New York stock exchange stood at $40,280,000,000. On Dec. 31, the bottom of the year's decline, this market value stood at $35,785,946,000, a depreciation of only 10%. The aforementioned figures compare with a valuation of $45,636,000,000 for January, and $41,848,000,000 for December of 1940.

From the foregoing data, it is clear that 1941 stock market movements were distinctly downward, but in no sense sensational. The whole showing is rather surprising, in view of the tremendous enlargement of business activity throughout the year due to large war orders, the prosecution of a tremendous national defense program and the tremendous earnings of the larger corporations. All through the year the market seemed to have been influenced by fear and indecision. Apparently the market discounted future prospects and was, therefore, uninfluenced by improved volume of business and earnings. Probably the market lethargy and general price decline was attributable to certain outstanding factors, such as a prospective huge increase in taxes, a burdensome and growing national indebtedness, the prospect of inflationary tendencies with their increased cost of raw materials, as well as increased labour costs. In addition the year was marked by constant labour troubles, by the adoption of priorities in business, by price restrictions and business regimentation and by a flood of selling for tax-deduction purposes.

Number, Volume and Amount of Stocks.—According to the New York Stock exchange's compilation, the total of stocks listed on that exchange on Dec. 1, 1941, stood at 1,464,000 shares, with a market value of $37,882,000,000. This value compared with $41,848,000,000 and $45,505,000,000 at the corresponding dates of 1940 and 1939. Of 1941's total, United States stocks aggregated 1,424,000,000 shares, valued at $37,253,000,000, and foreign stocks 40,475,000 shares, valued at $629,040,000. The total of shares was distributed over 1,216 separate United States issues and 19 foreign issues, representing a total of 862 issuing corporations.

Total shares traded on the New York Stock exchange during 1941 amounted to 170,534,363, as compared with 207,605,359 shares during 1940; 262,015,799 shares in 1939; 297,446,059 shares in 1938; and 1,124,991,000 shares in 1929, the largest total on record. From the standpoint of activity in sales, the 1941 market, as was the case in 1940, may be described as relatively stagnant. The New York Curb market had sales during 1941 of 34,690,900 shares, as compared with 43,041,774 shares during 1940. For other security exchanges of the country data were not available at the time of this compilation, but the other United States exchanges are relatively unimportant as regards volume of transactions, in comparison with the New York Stock and the New York Curb exchanges.

Bonds: *Price Movements During the Year.*—Using the Standard & Poor's barometer figure for sixty representative corporate bonds (average for each month based on daily closing prices), the average high price stood at 99·87 for January and 98·65 for February.

Thereafter, for the balance of 1941, the high average price varied between 100·4 for April and 85·5 for December.

Moreover, the monthly fluctuation between high and low was very meagre. Only during March was there a range between high and low as great as 3·25 points.

The yearly price movement thus shows a remarkably stable bond market during 1941, and at a comparatively high price level. The unsettled conditions prevailing in the stock market, as already explained, probably caused many to put their faith in presumably nonspeculative bonds. Again, the flotation of new bond issues was comparatively small throughout the year, thus bringing to the fore a considerable pressure for investment by insurance companies and other large investment concerns. For the year 1941, according to the New York Stock exchange's record, bond and note flotations of American corporations totalled only $2,277,772,000. But exclusive of refunding issues, investment trusts and holding companies, the total flotation amounted to only $1,018,166,000.

Number, Volume and Amount of Bonds.—According to the New York Stock exchange's compilation, the total par value of bonds listed on that exchange at the end of December stood at $58,236,901,000, with a market value of $55,033,616,000. This value compares with $54,139,000,000 and $50,374,000,000 for January 1941. The increase in the par value of bonds during the year is largely attributable to the issuance of large amounts of new United States government securities. Of 1941's total, United States corporation bonds amounted to (end of December) $16,861,810,000 par value, with a market value of $12,689,815,000; foreign company bonds with a par value of $897,654,000 and a market value of $689,506,000; United States government bonds (inclusive of corporations and subdivisions) with a par value of $38,217,692,000 and a market value of $40,567,112,000; and foreign governments (inclusive of subdivisions) with a par value of $2,882,000,000 and a market value of $1,305,000,000. The

Table II.—*Bond Prices for 1941*
For 60 Corporate Bonds
Source: Standard & Poor's Corporation

Month	High	Low	Month	High	Low
Jan.	99.87	98.30	July	100.2	99.26
Feb.	98.65	96.45	Aug.	100.1	99.33
March	100.0	96.75	Sept.	99.43	98.38
April	100.4	99.05	Oct.	99.55	98.62
May	100.0	98.67	Nov.	99.66	99.07
June	99.55	98.74	Dec.	85.5	82.0

total listed bonds of United States corporations were distributed over 895 issues with 448 issuers; of United States government with 77 issues and 7 issuers; and foreign governments with 197 issues and 80 issuers. Total bonds traded on the New York Stock exchange during 1941 amounted to $2,114,098,550, as compared with $1,671,598,875 during 1940 (the *New York Times* report) and about $2,048,000,000 for 1939.

Stock Exchanges.—During 1941 the New York Stock exchange not only made a considerable number of important changes in its rules, but also began consideration of a number of important prospective changes in policy. The most important of these actions may be grouped under five main headings:

Changes With Respect to Current Business Practices.—Effective Feb. 24, the committee on member firms of the New York Stock exchange announced that "approvals of member and member firm participation in secondary distributions would be announced on the stock ticker, and that such approvals would be conditional upon the distributor or syndicate manager keeping his books open for at least one-half hour after the announcement, in order to receive member and member firm applications for participation." On Jan. 4, a special committee on hours for business was appointed to report on this subject. Said report was accepted by the board of governors on Feb. 13, and the recommendation was to the effect that there be no change in the hours of business of the New York Stock exchange.

Proposed Legislative Changes.—On Feb. 12, a hearing was held before the ways and means committee of the New York assembly in the interest of a reduction in transfer taxes on exchange transactions. William McC. Martin, Jr., president of the exchange, appealed for a reduction of the New York state transfer tax and elimination of existing double taxation on odd-lot transactions. According to his testimony, "fully 88% of the shares listed on the New York Stock exchange are also traded on one or more of the out-of-town exchanges, where no tax is imposed upon the sale or transfer of stocks or where the taxes are moderate in comparison to those exacted by New York state."

Mention should also be made of the transmission by the department of stock list of the New York Stock exchange (July 10) to presidents of listed corporations of a letter from the American Institute of Accountants "outlining the procedure which, in its opinion, should be adopted in the interests of full and clear disclosure of federal tax provisions." This matter had previously been called to the attention of listed corporations by the department of stock list, which had already given its endorsement to the recommended procedure.

Various amendments were also offered to revise the Securities Exchange act. On April 14, Rep. James W. Wadsworth of New York offered amendments to the five acts administered by the SEC, including "simplification of registration procedure; fair hearings before adoption of rules or regulations; prohibition of publication of charges until proven; redress or appeal against an act of the commission; and amendment of the preamble of the Securities Exchange act to instruct the commission to encourage and foster orderly, active, stable and liquid markets." Again, on Aug. 7, the Securities and Exchange commission and a committee representing the financial industry submitted to the House Committee on Interstate and Foreign Commerce and the Senate Banking and Currency committee, 86 amendments to the securities acts. Of these, 48 related to the Securities act of 1933; 36 to the Securities and Exchange act of 1934; and two to the Federal Bankruptcy act. According to the announcement, the commission and the industry committee agreed upon 55 of the amendments submitted, and disagreed with respect to 31.

Multiple Line Trading.—On Feb. 14, 1940, a special committee of the New York Stock exchange reported in favour of the rigid enforcement of the exchange's constitutional provision prohibiting members of the exchange from dealing on another exchange in securities which are listed on the New York Stock exchange, and this action was approved by the board of governors on Feb. 28, 1940. Later, on April 12, 1940, Gov. Lehman signed the Williamson bill, removing prohibition of a stock exchange from making rules preventing a member from trading with members of other exchanges, thus facilitating the New York Stock exchange's enforcement of a rule against multiple trading privileges. Accordingly, the board of governors of the exchange ruled that, effective Sept. 1, "members and member firms may not act as dealers, odd-lot dealers, or specialists on other exchanges in securities which are listed on the New York Stock exchange, but may continue to accept orders from customers for execution on such other exchanges." The Securities and Exchange commission, however, on Oct. 25, 1940, requested the New York exchange to rescind its ruling, and thereupon the exchange advised that it "would await the SEC report of its investigation, in order to ascertain if any new facts had been developed, before reaching a final decision on the commission's request."

On August 13, 1941, the committee on member firms of the New York Stock exchange granted to all members and member firms temporary exemption from the multiple dealing rule, pending final determination of the proceedings before the SEC. Finally, on Oct. 4, the SEC announced the findings and opinion of the commission with respect to multiple dealing, and ordered the exchange "to amend its constitution, effective Oct. 6, to make clear that members of the exchange would not be prevented from acting as odd-lot dealers or specialists upon regional exchanges in securities listed on the New York Stock exchange." Following this order, on Oct. 27, the president of the exchange announced that the exchange had determined not to file a petition for a court review of the order.

Changes in Commission Charges and Differentials.—Two actions are important in this respect. One, on July 10, provides that, effective July 14, the Association of Bond Brokers of the New York Stock exchange reduce commission and clearing charges by 50% for United States government bonds and New York city corporate stock. The other, approved Nov. 3, provides that, effective Nov. 10, "the odd-lot differential on stocks selling at less than $1 and more than ⅛th would be increased from 1/16th to ⅛th. For stocks selling at ⅛th or less, the differential would be half the selling price." According to explanation by the odd-lot dealers of the exchange, the aforementioned change was made in order to cover their expenses.

Reorganization of the Government of the Exchange.—On March 5, at a general meeting of the members, the president of the New York exchange suggested that "the reorganization of the exchange be further extended by a reduction in the board of governors from 32 to 16 members; that the seven standing committees be reduced to three by elimination of the executive, member firms, public relations and stock list committees; and that the work of the eliminated committees be administered by a paid staff." This suggestion was approved by the board of governors on March 12, and the president was authorized to appoint a special committee to prepare amendments to the constitution for improving the government of the exchange.

The aforementioned amendments were submitted on July 23, were approved by the membership on Aug. 6, and were slated to become effective Sept. 30. They provided that the board of governors be reduced from 32 to 25; that all standing committees be abolished; that the rule-making powers of the committees be transferred to the board of governors; and that the election of the nominating committee be held at the same time as the election of governors. The broad objectives of the change, according to the announcement, were "to establish the board of governors as the exchange's sole policy-making body; to centralize administrative authority in the president; and to provide the constitutional framework for a competent, responsible and representative government of the exchange." On Sept. 22 announcement was also made of the reorganization plans of the Association of Stock Exchange Firms, "designed to convert the association into a dynamic and vigorous trade body of national scope." The plan, as announced, was approved by the association's membership on Oct. 7.

Financial Record of the New York Stock Exchange.—On Feb. 25, 1941, the annual financial report of the New York exchange and affiliated companies, for the year ending Dec. 31, 1940, was submitted to the members, showing a net loss for the year, after depreciation, of $981,348, compared with $1,149,373 in 1939. Data submitted to the SEC (Sept. 18) disclosed that member firms of the exchange made a small profit on all types of operations during the first half of 1941. According to press accounts, however, "firms receiving their income mainly from security commissions suffered a loss, while firms that received more of their income from noncommission activities showed a profit. The average return on capital invested in member firms was estimated at 3.2%." This meagre return is probably typical of all the other exchanges, and shows the state of retrogression in U.S. speculative security markets as compared with the prosperity of the late '20s. All through the year 1941 the price of New York Stock exchange seats was exceptionally low, the latest quotation being only $25,000.

Mention should also be made of an amendment to the constitution of the New York Stock exchange, retroactive to Jan. 1, 1941, which would apply the principal of the gratuity fund reserve in excess of $500,000 in reduction of amounts payable by members upon the deaths of other members. On Dec. 31, 1941, the net worth of the gratuity fund was $1,927,824, and this amendment, it was estimated, would relieve members of gratuity contributions for four or five years. Legal approval of the amendment was secured from the court of appeals of New York state on Dec. 5.

(S. S. H.)

Stolz, Joseph (1861–1941), U.S. dean of reform rabbis of America, was born Nov. 3 in Syracuse, N.Y. He was graduated from the University of Cincinnati in 1883 and the following year completed his theological studies at the Cincinnati Hebrew Union college. Reverend Stolz was a member of the Chicago school board from 1899 to 1905, a member of the Chicago Crime commission, organized many Jewish charities in Chicago, and aided in their unification. He served as president of

the Central Conference of American Rabbis, and as president of the Chicago Rabbinical association. He was a rabbi in Chicago congregations from 1887 until his retirement in 1927. He died in Chicago, Feb. 7.

Stomach Disorders: *see* ALIMENTARY SYSTEM, DISORDERS OF.

Stone, Harlan Fiske (1872–), U.S. jurist, was born Oct. 11 in Chesterfield, N.H. He worked his way through Amherst college, where he was an honour student, receiving the degree of B.S. in 1894 and M.A. in 1897. He then worked his way through Columbia School of Law by teaching in a Brooklyn academy; he received his law degree in 1898. The same year he was admitted to the New York bar. He was a lecturer and professor of law, and for a time dean, of the law school at Columbia, 1899–1923. On April 7, 1924 he was appointed attorney general of the United States by President Calvin Coolidge. In this position he inaugurated a number of anti-trust proceedings, most notable of which was that against Aluminum Company of America. On March 2, 1925, he became an associate justice of the U.S. supreme court.

On June 12, 1941, President Roosevelt named him chief justice to fill the vacancy created by the retirement of Charles Evans Hughes.

In politics Chief Justice Stone has been regarded as a liberal Republican, having upheld many of the New Deal policies.

Stone. The following table lists the various types of stone produced in the United States, and the division of the total output into dimension stone and crushed stone.

Production of Stone in the United States

(In thousands of short tons or thousands of dollars)

Name of Stone	1939	1940		
	Total	Total	Dimension	Crushed
Basalt	16,091	15,716	22	15,694
Granite	12,041	10,881	658	10,222
Limestone	100,846	112,658	1,082	111,576
Marble	228	240	89	151
Sandstone	8,854	6,498	172	6,327
Others	9,387	7,740	83	7,656
Total	147,447	153,733	2,107	151,626
Value	$158,462	$160,044	$21,417	$138,627

Dimension Stone.—Sales of dimension stone in 1940 were 8% less in quantity and 16% less in value than in 1939. The 1940 distribution by uses was 83% for building construction, 9% for monumental work, 3% for flagging and 5% for curbing and paving blocks. Beside the tonnage listed above, there were 154,450 tons of slate sold as dimension stone in 1940.

Crushed Stone.—Sales of crushed stone in 1940 improved by 4% over 1939 in both quantity and value. Concrete and road metal took 61%, metallurgical and refractory used 16%, agricultural used 6% (all limestone), railroad ballast 5%, and riprap 3%, while various industrial processes (alkalies, carbide, glass, paper, sugar) took 5% and 4% was unclassified.

Basalt.—The high proportion of crushed stone in the basalt classification is explained by the fact that the chief use for the basalt group (including traprocks) was in highway construction and concrete aggregate.

Granite.—Building construction used 64% of the granite dimension stone sold in 1940, monumental work 26% and curbing and paving blocks 10%; 81% of the crushed stone was for concrete aggregate and road metal, 8% for railroad ballast, 6% for riprap and 5% for other uses.

Limestone.—Of the total dimension stone sales in 1940, more than half was limestone, all but 1% building stone. Concrete aggregate and road metal took 55% of the crushed limestone, metallurgical flux 20%, agriculture 8%, railroad ballast 5%, riprap 3% and other uses 10%. The figures above do not include 33,986,000 tons of limestone quarried for the production of portland cement, nor 9,774,000 tons used in the manufacture of lime.

Marble.—Dimension stone in 1940 was divided 73% for building construction and 27% for monumental stone; crushed marble is mainly made from defective material or waste from the production of dimension stone.

Sandstone.—Dimension sandstone in 1940 was mainly used for building construction, this accounting for 59%, while 27% went to flagging, and 14% for curbing and paving blocks. Concrete and road metal took 53% of the crushed sandstone, refractory uses 13%, riprap 5%, railroad ballast 3%, with 25% unclassified.

Other Stones.—The list of stones other than those listed that are used to some extent is quite large, but the aggregate amount is comparatively small. The dimension stone is mainly for building construction, and the crushed stone for concrete. (G. A. Ro.)

Stonehaven, John Lawrence Baird, 1ST VISCOUNT, OF URY (1874–1941), British statesman, was born April 27. He was educated at Eton and Christ Church, Oxford, and he entered the diplomatic service in 1896, serving in minor posts in Vienna, Paris, Cairo, Buenos Aires and Addis Ababa. He sat in commons from 1910 to 1925 as a member of the Coalition Unionists. He was parliamentary undersecretary of state for the home office, 1919–22, and minister of transport and first commissioner of works, 1922–24. He was created a baron in 1925 and in the same year became governor general and commander-in-chief of Australia, a post he held until 1930. Baron Stonehaven was chairman of the Conservative party organization, 1931–36 and was made a viscount in 1938. He died at his home in Stonehaven, Kincardineshire, Aug. 20.

Straits Settlements. One of the large subdivisions of British Malaya, the others being the Federated and Unfederated Malay States (*qq.v.*). It is administered by a governor with an advisory council. Governor in 1941 (appointed in 1934): Sir Thomas Shenton Whitelegge Thomas. The seat of administration is Singapore (*q.v.*). Area, 1,356 sq. mi.; pop. (June 30, 1940) 1,406,120. The Chinese are the most numerous element in the population, with Malays second and Indians third. The Straits Settlements include the two chief ports and transhipment centres of British Malaya—Singapore and Penang. The administrative subdivisions are: Singapore island, Penang island, Province Wellesley, Malacca, Labuan, Pangkor, Christmas island and the Cocos islands.

Penang island and Province Wellesley were rapidly overrun when the Japanese invaded Malaya in force in Dec. 1941.

Education.—There were 417 schools in 1941 (60 in the English language) in the Straits Settlements and two institutions of higher education, Raffles college and King Edward VII College of Medicine, both at Singapore.

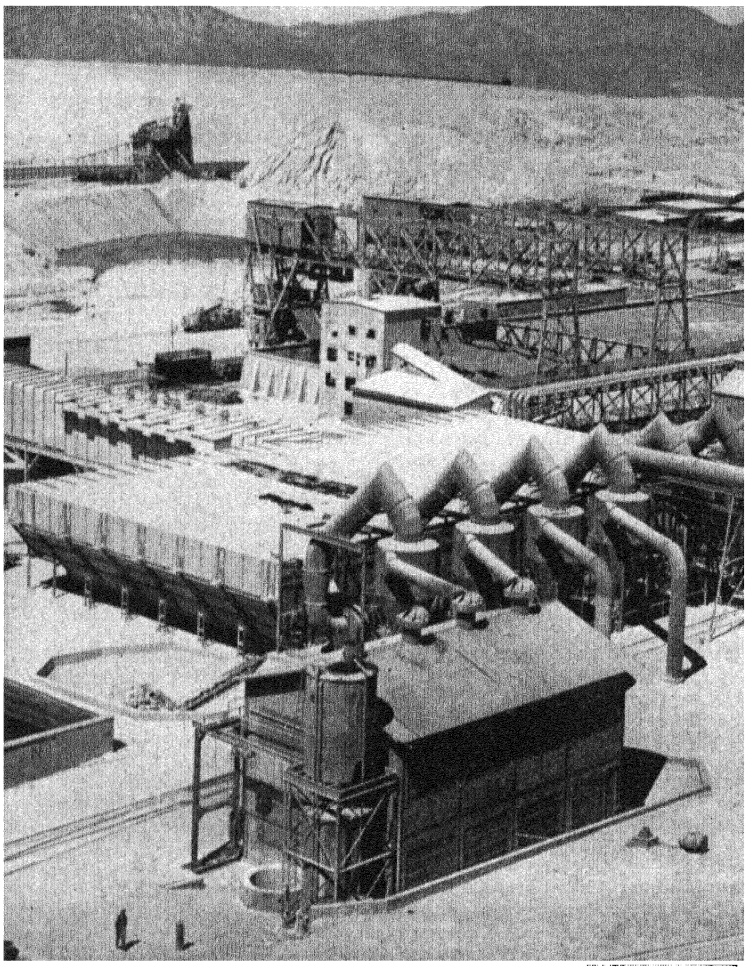
Finance.—The estimates for 1941 called for a revenue of £5,400,977 and expenditures of £6,684,081. There was a long-term public debt of 30,000,000 Straits dollars. The unit of currency is the Straits dollar (47.51 cents U.S. in 1941).

Trade.—The foreign trade of Malaya in 1939 was £72,406,000 of imports and £85,923,000 of exports, rubber and tin being the principal exports.

Communication.—There were 1,067 mi. of metalled and 138 mi. of gravel roads in the Straits Settlements at the end of 1939. There were 3,581 mi. of telegraph and telephone lines. (W. H. CH.)

Strategic Mineral Supplies. Although such a procedure has been advocated for some 15 years, it was not until midyear of 1939 that congress finally embarked on a program of purchasing and storing supplies of strategic materials. However, this program was started too late and on too small a scale to have accomplished much before the outbreak of World War II in September 1939 caused so much disorganization in the markets, and such a shortage of shipping facilities as to make further progress slow and difficult. By midyear of 1940 it had become so evident that more speed must be made that the Metals Reserve company, a subsidiary of the Reconstruction Finance corporation (*q.v.*), was established as a buying agency for mineral and metal supplies. From published reports of this agency it appeared that up to Oct. 22, 1941 orders had been placed for materials aggregating close to 7,250,000 tons, valued at more than $1,000,000,000, and that delivery had already been made on over a million tons.

With purchases of many imported materials hampered by war conditions, the speeding up of industry incident to the defense program inaugurated by the United States caused some shortages to appear, and when lend-lease aid was superposed on the defense program the impending shortages became more acute. Then as time went by it became apparent that the original plans had not anticipated the enormous amounts of mineral and metal products required by a modern program of mechanized warfare, and successive upward revisions had to be made in the requirements



THE U.S.-OWNED COPPER DEPOSITS at Chuquicamata, Chile, largest in the world, were worked ceaselessly in 1941 as military demands increased for the strategic metal

schedules. Finally, on top of all this, on Dec. 7, 1941, the attack by Japan brought the United States in as an active participant of the war on her own account, and naturally this was expected further to accentuate the demands that must be filled, and increase the shortages that were already becoming manifest.

These increased demands became so great through the successive stages of development that not only had special attention been required to maintain the supplies of the so-called strategic minerals, but there were created shortages in such common metals as steel, copper, lead and zinc, the supply of which had not been expected to cause any serious difficulty. A curious feature of this situation was that of the entire metal list, the ones of which the supply is best maintained were mercury and antimony, both of which were on the strategic list since it was first established. However, it had not been definitely established that some of the shortages might not have been caused, or at least intensified, by overbuying on the part of some who had been trying to protect their own future supplies at the expense of others who could not secure their due share. In any case, the United States was faced in 1941 with a situation far worse than anything that had been considered possible, and price control, priorities, rationing and substitution were being called upon to help in the solution of the difficulty.

Axis Supply.—All of the axis powers were lacking in many more of the essential mineral products than the Allies. In one short month of action Japan not only deprived the United States of manganese and chromite from the Philippines, tungsten and antimony from China, and tin and petroleum from Malaya and Netherlands East Indies, to mention only a few of the major items, but actively threatened to gain control of these areas with the advantage of access to these supplies for her own use. Of these two points, the latter was far more important, for the United States could better afford to do without these things than it could afford to see the enemy gain the use of them. In the course of four years of conquest, two without war and two with war, Germany succeeded in supplying most of her really pressing shortages from the countries that were occupied. Chief among those supplies still troublesome were petroleum, manganese, nickel, chromium and tungsten. Considering the rate of progress, most of the real improvement was made in the first year of the war, and in view of the wider area covered, as compared with the resources acquired with them, the position at the end of the second year of war showed a relatively lower degree of sufficiency for the axis than at the end of the first year. (G. A. Ro.)

Strikes and Lock-outs.

The United States, Canada and Great Britain publish current statistics of strikes and lock-outs, their causes and results, together with detailed reports upon the more important strikes of each year. Most of the other nations report them less regularly;

Table I.—*Number of Strikes, Workers Involved, and Man-Days Lost, 1935—December 1941

Monthly Labor Review, United States Bureau of Labor Statistics (Dec. 1941)

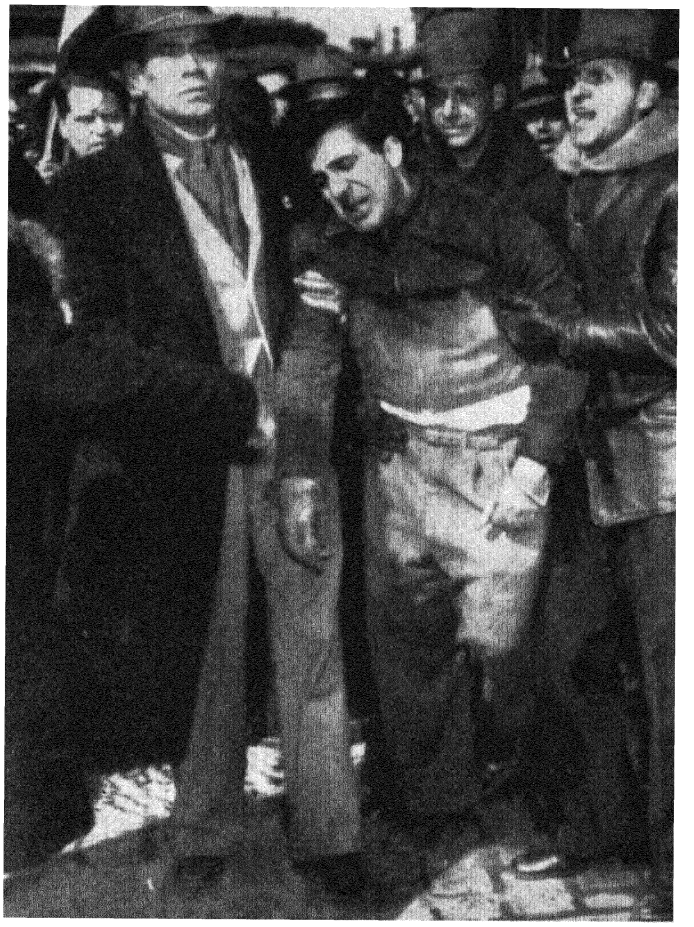
Year and month	Number of strikes			Workers involved in strikes		Man-days idle during month or year
	Beginning in month or year indicated	In progress during month	Ended in month	Beginning in month or year	In progress during month	
1935	2,014	..	..	1,117,213	..	15,456,337
1936	2,172	..	..	788,648	..	13,001,956
1937	4,740	..	..	1,860,621	..	28,424,857
1938	2,772	..	..	688,376	..	9,148,273
1939	2,613	..	..	1,170,962	..	17,812,219
1940	2,508	..	..	576,988	..	6,700,872
1941						
January	232	341	216	91,562	109,533	660,535
February	253	379	231	69,769	125,466	1,131,460
March	338	486	304	116,320	176,846	1,553,200
April	393	575	381	510,813	564,065	7,099,392
May	448	642	439	324,506	420,143	2,181,796
June	335	538	359	140,220	221,936	1,469,248
July	402	581	379	138,201	216,902	1,301,920
August	422	624	437	207,456	293,617	1,750,013
September	475	..	..	270,000	289,738	1,885,224
October	450	..	..	272,000	198,757	1,888,600
November	300	..	..	235,000	..	1,150,000
December	175	..	..	35,000	..	500,000

*Strikes involving fewer than 6 workers or lasting less than 1 day are not included in this table nor in the following tables. Notices or leads regarding strikes are obtained by the Bureau from more than 650 daily papers, labour papers, and trade journals, as well as from all government labour boards. Letters were written to representatives of parties in the disputes asking for detailed and authentic information. Since answers to some of these letters had not been received, the figures given for the late months are not final. This is particularly true with regard to figures from September on and these should be considered as preliminary estimates.

Table II.—*Major Issues Involved in Strikes in the United States beginning in January, June and August 1941*

Major issue	January		June		August	
	Number	Percent	Number	Percent	Number	Percent
All issues	213	100.0	325	100.0	422	100.0
Wages and Hours	*64*	*30.0*	*145*	*44.6*	*152*	*36*
Wage increase	54	25.3	135	41.5	130	30.8
Wage decrease	3	1.4	2	.6	9	2.1
Wage increase, hour decrease	5	2.3	8	2.5	..	..
Wage decrease, hour increase	..	..	..	..	13	3.1
Hour increase	1	.5	..	..	..	..
Hour decrease	1	.5	..	..	..	..
Union organization	*105*	*49.3*	*143*	*44.0*	*209*	*49.5*
Recognition	23	10.8	19	5.8	41	9.7
Recognition and wages	26	12.1	65	20.0	72	17.1
Recognition, wages and hours	13	6.1	11	3.4	14	3.3
Discrimination	18	8.5	12	3.7	24	5.7
Closed or union shop	20	9.4	23	7.1	41	9.7
Strengthening bargaining position	1	.5	10	3.1	12	2.8
Other	4	1.9	3	.9	5	1.2
Miscellaneous	*44*	*20.7*	*37*	*11.4*	*61*	*14.5*
Sympathy	1	.5	3	.9	6	1.4
Rival unions or factions	9	4.2	11	3.4	16	3.9
Jurisdiction*	9	4.2	5	1.5	14	3.3
Other	24	11.3	18	5.6	24	5.7
Not reported	1	.5	..	..	1	.2

Compiled from *The Monthly Labor Review*, U. S. Bureau of Labor Statistics.
*It is probable that the figures given do not include all jurisdictional disputes in the United States.

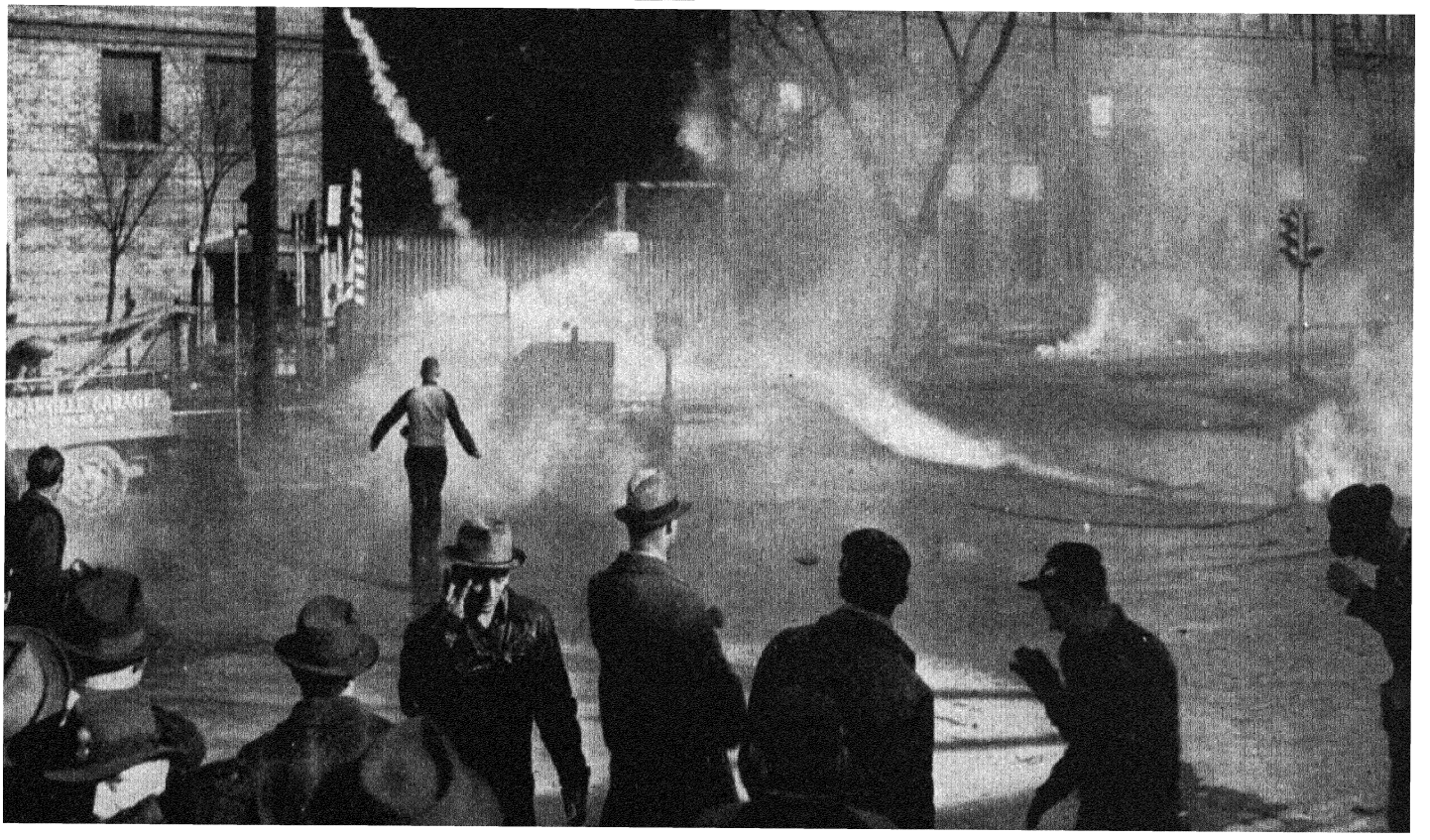


Above, left: HANDIWORK OF STRIKERS at the Bethlehem Steel home plant, Bethlehem, Pa., in March 1941

Above, right: FIGHTING between A.F. of L. and C.I.O. workers broke out several times in March 1941 during a strike of the International Harvester's McCormick plant at Chicago

Centre, left: U.S. ARMY REGULARS were summoned by President Roosevelt June 9, 1941 to open the North American Aviation plant at Inglewood, Calif. after a "wildcat" strike had stopped work on large orders for military aircraft

Below: TEAR-GAS BATTLE at the main gate of the Allis-Chalmers plant in Milwaukee, closed by strike from January 22 to April 8, 1941



some not at all. The Canadian department of labour published a report on strikes throughout the world in the *Labour Gazette*, March 1937.

The political situation in Germany, Italy, Russia and Japan made it "inadvisable" for wage earners to undertake strikes. The European war added Czechoslovakia, Poland, France, Norway, Denmark, the Low Countries, Bulgaria, Rumania, Greece, Finland, to the area in which strikes would be ruthlessly suppressed.

The year 1940 saw less strike activity in the United States than in 1939 but a definite increase in the number of strikes toward the end of the year which continued on into 1941, when strike activity was much greater than in either 1939 or 1940. There were 4,223 strikes started during 1941, compared with 2,613 in 1939 and 2,508 in 1940.

In 1939 there was a loss of 17,812,219 man-days, in 1940 only 6,700,872, and in 1941, 22,571,388. During 1937 the loss of man-days was 28,424,857. The maximum loss of man-days in any month of 1941 was 7,099,392 in April. The next largest month was 4,876,744 in April 1939.

Table I on page 628 shows for the United States the number of strikes, workers involved and days lost, 1935–41. The year 1937 was still the record year in number of strikes since 1917. The number of strikes began to increase in 1933 and rose steadily through 1937. The number declined steadily through 1940 and increased again in 1941.

The monthly reports on strikes issued by the U.S. bureau of labour statistics indicated that close to one-half of the strikes of 1941 involved some question of union recognition, with wages the other major issue. This distribution was characteristic of 1937 through 1941. Tables IV and V show the causes of British disputes and their results. Two contrasts with the U.S. situation stand out—in Table IV the absence of "union recognition" unless included in "questions involving trade union principles," and in Table V the large percentage of the strikes which ended definitely in favour of the employers.

Canada had only 192 strikes in 1940 involving 63,469 workers and but 259 involving 97,779 employees in 1941. (*See* also DEFENSE MEDIATION BOARD, NATIONAL; DEFENSE, NATIONAL [U.S.]: *Labour;* NATIONAL LABOR RELATIONS BOARD; NEWSPAPERS AND MAGAZINES; UNITED STATES: *Labour Problems.*)

(D. D. L.)

Table III.—*Relative Frequency and Size of Labour Disputes in Great Britain in 1941 and 1940*

Month	Number of Disputes Started in Month		Number of Work People Involved in All Disputes during Month		Working Days Lost in Labour Disputes during Month	
	1941	1940	1941	1940	1941	1940
January	64	73	13,300	56,800	24,000	108,000
February	60	57	13,100	40,800	23,000	168,000
March	121	82	63,400	52,600	285,000	165,000
April	97	91	45,700	22,500	187,000	82,000
May	113	92	31,700	35,800	74,000	91,000
June	82	30	28,200	7,300	80,000	14,000
July	60	40	16,500	11,700	25,000	33,000
August	94	50	22,100	7,400	44,000	13,000
September	135	83	30,600	20,100	93,000	52,000
October	145	..	33,000	..	96,000	..

Compiled from British *Labour Gazette.*

Table IV.—*Causes of Labour Disputes in Great Britain, 1941, by Months.*

Cause	J	F	M	A	M	J	J	A	S
Demands for wage increases	14	14	33	20	25	23	12	36	30
Resistance to wage reductions	3	5	10	4	2	..	3	2	7
Other wage questions	22	11	20	30	33	33	25	29	30
Hours	..	3	4	6	4	3	1	4	6
Employment of particular classes of people or individuals	12	14	20	18	16	13	9	12	16
Other working arrangements	10	12	26	16	24	8	10	11	20
Questions involving trade union principles	3	1	7	2	2	2	..	5	7
Sympathetic strikes	..	..	1	1	4	..	..	..	1

Compiled from British *Labour Gazette*, Oct., 1941.

Table V.—*Results of Labour Disputes in Great Britain Settled in 1941*

Results of Strikes	J	F	M	A	M	J	J	A	S
Settled in favour of labour	7	11	15	17	12	12	5	10	8
Settled in favour of employers	28	28	52	42	56	41	31	34	61
Settled by compromises	22	12	27	31	31	2	9	26	32
Negotiations pending, but work resumed	6	10	18	15	14	23	15	15	27

Compiled from British *Labour Gazette*, Feb.-Oct., 1941.

Table VI.—*Number and Time Loss in Canadian Labour Disputes*

Month	1940			1941		
	No. of Disputes	No. of employees involved	Time loss in working days	No. of Disputes	No. of employees involved	Time loss in working days
January	6	919	6,861	10	1,453	3,238
February	13	3,041	12,749	8	1,787	7,514
March	12	1,981	14,940	11	1,135	3,515
April	19	13,839	64,914	32	19,406	75,430
May	23	8,590	51,122	35	6,202	23,926
June	14	6,837	38,827	29	7,320	38,143
July	21	8,563	21,186	29	21,860	48,572
August	22	6,923	13,821	33	12,348	32,042
September	15	3,057	6,476	27	10,495	79,896
October	22	8,130	17,949	20	5,085	20,800
November	16	3,646	15,964	14	4,880	42,791
December	9	903	3,360	11	5,718	54,945
Total	192	63,469	268,169	259	97,779	430,812

Compiled from *Canadian Labour Gazette.* All 1941 figures are preliminary.

Table VII.—*Trend of Labour Disputes in Canada, 1931–40*

Year	Number of disputes	Number of workers involved	Time loss in man-working days
1931	88	10,738	204,238
1932	116	23,390	255,000
1933	125	26,558	317,547
1934	191	45,800	574,519
1935	120	33,269	284,028
1936	156	34,812	276,997
1937	278	71,905	886,393
1938	147	20,395	148,678
1939	122	41,038	224,588
1940	192	63,469	268,169

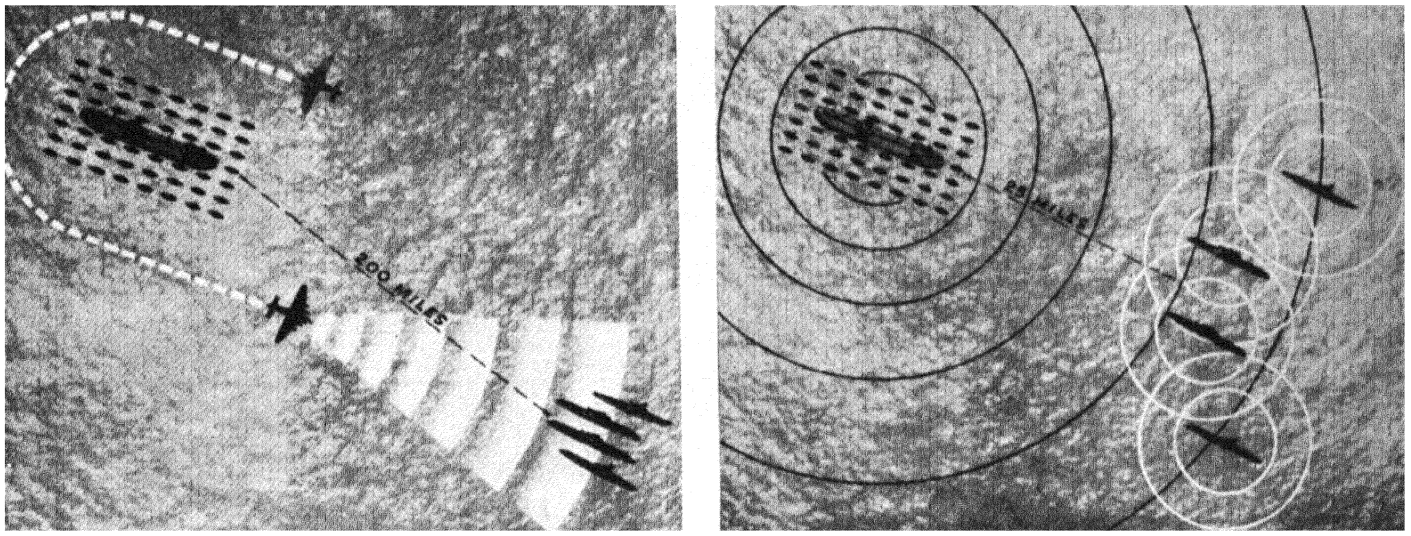
Compiled from *Canadian Labour Gazette.*

Strontium. World production of strontium ores is small, usually under 10,000 tons annually. The United States had been importing 2,700–2,800 short tons annually, mostly celestite (strontium sulphate) from England, and 250–350 tons of strontium chemicals from Germany, produced from local deposits of strontianite (strontium carbonate). Access to German sources for chemicals was entirely cut off by the war, and production from domestic deposits was begun in 1940, and both strontium metal and chemicals were being produced from domestic ore.

(G. A. Ro.)

Stuart, James Everett (1852–1941), U.S. painter, was born March 24 in Maine. He discovered a process of painting on aluminum sheets by which the pigments could be made to attach themselves to and become part of the metal painted. His earliest sketches of the Sacramento and San Joaquin rivers in California date from 1861. These he later developed into pictures showing the natural beauty of California in early days. The scenes of his landscapes range from Alaska to the Panama canal and from Maine to California. Five of his paintings on aluminum, four of them "Sunset Glows" and the fifth "Raspberries," sold for $15,000 each. He died Jan. 1, in San Francisco.

Submarine Warfare. **The War on Shipping.**—During the three months of warfare in 1939



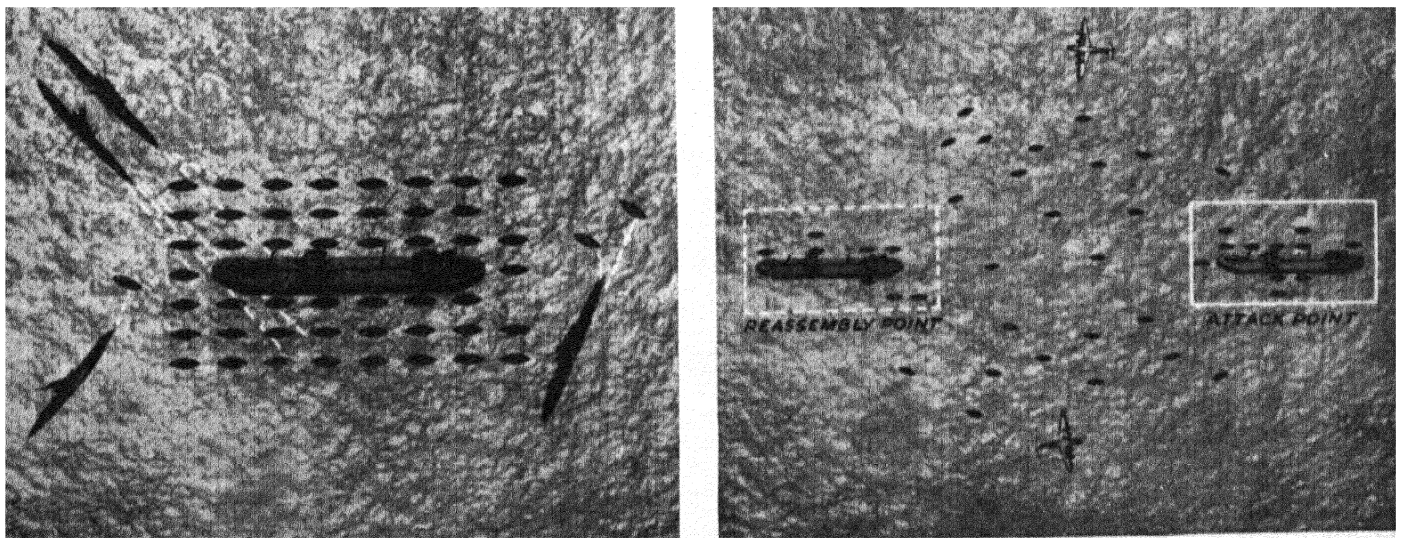
TYPICAL SUBMARINE ATTACK upon a British merchant convoy. (Left) A German scouting plane spots the convoy and radios the size and location to a central base which relays the information to submarines in the vicinity (in this case 200 mi. distant). The submarines ordinarily travel three or four together. (Right) Moving below the surface by day and travelling at top speed on the surface at night, the submarines trail the convoy. They can pick up the sound of the ships' engines long before their own motors are detected

the total loss of merchant shipping owned by and available to the Allies was admitted to be 781,000 tons.[1] It was estimated that the total loss of Allied and neutral shipping during 1940 was 3,548,500 tons; the British admiralty later closely confirmed this with an official figure of 3,519,048 tons. Experience since 1939 had demonstrated that official figures released by the admiralty on this subject were correct although there was usually a considerable time lag before the revised and verified figures were made available. German claims were highly exaggerated, so much so that one would not go far astray if nazi figures on merchant sinkings were divided in half to obtain a close estimate of the truth. It seemed advisable, therefore, in estimating the shipping losses of the Allies during 1941 to rely on British official admissions as far as possible, and to estimate from pertinent statements by the prime minister and the admiralty for months for which no figures were given. Other estimates that came to the attention of this writer usually had been made from press reports of known sinkings and were generally incomplete and misleading.

During the year 1941 the veil of secrecy was drawn over merchant shipping losses by the admiralty, although an occasional glimpse behind the veil was vouchsafed. In April British officialdom announced that thereafter losses would be given out monthly instead of weekly, and after June even monthly figures were discontinued. After that time statements of losses were in very general terms, though affording a hint of the truth. Based on available information, the table of losses on p. 632 is presented.

The dawn of 1941 was dark. Mounting losses of merchant shipping caused largely by the quickened tempo of submarine warfare during the closing months of 1940, forewarned of critical losses ahead. It appeared that the Battle of the Atlantic was the crucial one for Britain and that sinkings would reach a figure beyond all possibility of replacement. That the most deadly foe was the U-boat was verified by the nazi Admiral Raeder's announcement that two-thirds of all sinkings were by submarine action, and the British took such steps as were possible to forestall the spring drive. Heavy air raids on submarine bases on the Norwegian and French coasts and on submarine building yards were continued; the shipbuilding program was further accelerated, even the president of the United States calling for a speed-up in American construction. The new type of escort and anti-submarine vessel, the small corvette, began to prove its worth and more

[1]All assertions or opinions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the U.S. navy department or of the naval service at large.



(Left) Fanning out, the submarines pounce at night from different angles. Two fire torpedoes diagonally through the convoy, thus lessening the probability of misses, while a third engages an armed merchantman and the fourth concentrates on stragglers. All then turn about, fire torpedoes from their rear tubes and flee before destroyers can overtake them. (Right) After the attack has passed, the ships reassemble under the direction of British planes

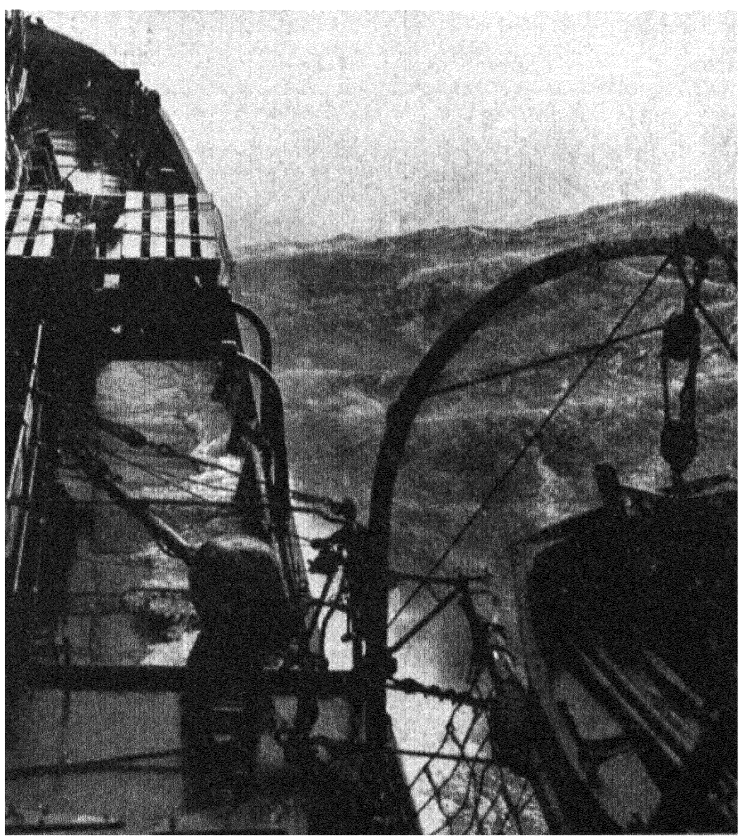
were placed on the building ways. In spite of these remedies January losses were nearly 500,000 usable tons, more than in any previous month.

In February losses were somewhat less, 340,000 tons, and a further reduction to 307,500 tons occurred in March. Tempestuous seas and thick weather undoubtedly were responsible for this falling-off, and pessimism still reigned. Statements from neutral sources that the nazis had ready for the spring campaign about 600 submarines, 300 of which would be on the hunt at a time, were alarming; Hitler himself threatened publicly that Britain "will find out whether we slept through the winter—new types of submarines are going to be brought into the expanded warfare." On top of this the addition of 12 Danish submarines to the German flotillas caused scarcely a ripple. In mid-March the British high command recognized the gravity of the situation by creating an overlord of the Atlantic; the experienced Admiral Sir Percy Noble was named as commander in chief of the western approaches to Britain. In late March it became apparent that U-boats were extending their sphere of action; attacks were reported within 1,500 mi. of New York and off the western bulge of Africa, and Germany extended the submarine war zone to within three miles of Greenland.

April lived up to its advance notices; losses mounted to the greatest monthly toll yet taken, 589,500 tons of Allied and neutral merchantmen, but nearly 200,000 tons of this was lost by bombing in Greek waters while evacuating the retreating British expeditionary force. But this huge total was still well below the heaviest monthly loss in World War I 834,000 in April 1917. Further steps were now taken to combat the underseas menace. In the most intensive raid up to Jan. 1, 1942, hundreds of tons of explosives and 30,000 incendiaries were dropped on the submarine building yards at Kiel. Ten United States coast guard cutters, splendidly equipped as escort vessels, were turned over to the Royal navy. President Roosevelt extended the United States navy's patrol of the seas "as far as necessary for defense of the western hemisphere"; this meant that British escort vessels could largely be dispensed with in the western Atlantic, permitting concentration in the vital area between Eire and Iceland. There was further reason for optimism in the fact that a breakdown of late losses showed that barely 40% were due to submarine attacks—aircraft, mines and surface warships accounting for the rest.

During May and June wolf-packs of U-boats were very active and their toll was heavy. But even in June it became apparent that the new United States policy of all-out aid was beginning to be effective. U.S. navy ships and aircraft were now searching out, trailing and reporting axis craft in the western reaches of the Atlantic and that this was having a telling effect

THE CORVETTE, here shown riding a rough sea, was one British answer to the submarine menace in 1941. These small 1,100-ton ships, designed for convoy duty, can be built in a third of the time required to complete a destroyer



Allied and Usable Neutral Tonnage Losses

1939 Total Losses	781,000
1940 Total Losses	3,519,000

1941	Monthly Average	Grand Total
January	488,000*	4,788,000
February	340,000*	5,128,000
March	307,500*	5,435,500
April	589,500*	6,025,000
May	658,000†	6,683,000
June	420,000†	7,104,000
July	250,000‡	7,354,000
August	200,000‡	7,554,000
September	150,000‡	7,704,000
October	150,000‡	7,854,000
November	125,000§	7,979,000
December	250,000¶	8,229,000
Total for 1941		3,708,000
Grand Total for War		8,229,000

*Figures from British admiralty and ministry of information.
†These figures have been adjusted to meet the admiralty total through June of 7,103,980 tons.
‡Churchill stated total losses July–October inclusive less than 750,000 tons.
§Admiralty said November loss was lowest since the fall of France.
¶Includes probable Allied losses to Japan in the Pacific.

was indicated by Admiral Raeder's bitter complaint that these patrols were "aggressive" and his violent warning against American participation in convoying. June saw the loss of the first United States merchantman, the "Robin Moor," torpedoed in the South Atlantic; this treacherous act was soon followed by others of like nature, and these served only to strengthen the American resolve to assist in all measures short of war to eradicate the U-boat from the seas.

The crest of the submarine wave was reached during the second quarter; in succeeding months losses fell off sharply and in mid-November Prime Minister Churchill averred that during the four months, July through October, the total loss was less than 750,000 tons. This astonishing improvement must be laid to the following factors: (a) the increase in aid lent by United States naval forces in patrolling and escorting as far as Iceland; (b) the entrance of Russia and the consequent withdrawal of strong nazi air squadrons from the Atlantic to the eastern front; (c) the recall of U-boats from the Atlantic for use in the Gulf of Finland and the Barents sea; (d) more and heavier air raids on submarine bases and building yards; (e) increased numbers of corvettes for escorting convoys; (f) faster and better constructed merchantmen in service; (g) the growing use of auxiliary aircraft carriers with convoys; (h) increased flying patrols around the United Kingdom.

Whatever the reasons, it appeared that the submarine threat was definitely on the wane. Even nazi sources admitted that July sinkings were nearly 50% less than in June, and the bettered conditions were further reflected by an increase in the British food ration and the substantial reduction of certain marine insurance rates. So improved was the situation that in late November the ever-candid Winston Churchill was moved to announce, "We are once again masters of our destiny."

Still better, London declared that the losses for November were the lightest since the fall of France—probably less than 100,000 tons; this was an early report, and since later returns always swell the initial figure, it was considered that 125,000 tons was a safe estimate for this month. No report of losses for December were given out by Jan. 1, 1942, but such data as were available indicated no great increase over November in the Atlantic. A new factor, however, now influenced the over-all picture the declaration of war on Britain and the United States by Japan. Nipponese submarines immediately became active on Pacific trade routes, sinking vesssels even within sight of the California coast. From this cause and by the seizure, as claimed by the Japanese, of 200 British and American bottoms in the Orient, total losses were undoubtedly swollen far beyond the November figure. December tonnage losses, by submarine and otherwise, were estimated at 250,000 tons.

Throughout the year Britain, with the ever-increasing aid of the United States, made valiant efforts to offset shipping losses with new construction. Since the United Kingdom already was near top production, it early was apparent that increased losses must be met by American shipyards, and this was impressed upon builders as early as January by President Roosevelt. (*See* SHIPBUILDING; SHIPPING, MERCHANT MARINE.) The augmented program had not only to replace actual sinkings but to make up for merchantmen so damaged as to be temporarily out of service (estimated at times to be as much as 1,000,000 tons) and for the retardation in their turnaround due to slow convoys and bombed terminal facilities. On the last day of March the United States added to the pool by taking over 28 Italian, 36 Danish and 2 German vessels interned in its ports. In April it was authoritatively announced that combined British-American building amounted to 2,000,000 tons a year, only a fraction of that necessary to offset losses. In June the United States took over British shipping routes in the Pacific, thereby releasing more British merchantmen for the North Atlantic lifeline; this stopgap was insignificant in view of the July announcement of Admiral Land of the U.S. Maritime commission that in 1941 the United States would produce 134 new ships and 574 in 1942, a total of about 6,000,000 tons. In October Admiral Land again committed himself to the effect that American ship construction had now caught up with losses. The law permitting the arming of United States merchantmen, as passed in November, was expected also to act to decrease sinkings. The last shipbuilding report of the year, in December, stated that the British alone were producing 80,000 new tons a month but, although every sinew was being strained by the democracies, this was still only a fraction of that necessary.

In World War I the war against shipping was distinctly one-sided, but in 1941 it proved to be a game at which two could play. The axis powers, in addition to their Mediterranean lines of communication, acquired by

conquest a long Atlantic coastline, and the overtaxing of railroad facilities made it necessary to augment land communications with a considerable amount of sea transport. Britain was not slow to take advantage of this situation. Submarines and aircraft were launched against these lines with considerable success, and British, Greek, Dutch and even Yugoslav submarines were on the hunt for essential axis supplies in the Mediterranean with troopships as their choicest tidbits. That the toll of these campaigns was felt was indicated by the fact that in April Germany found it necessary to requisition 53 Vichy-French ships to replenish losses. In June the British minister of economic warfare said that losses of enemy bottoms amounted to 3,000,000 tons and that the axis faced a shipping crisis. Prime Minister Churchill in November stated that during the preceding four months 1,000,000 tons of enemy shipping had been sunk or severely damaged. With the new Allied attack on Libya in mid-November the Italy-Africa lines came under still more vigorous attack. No year-end figures of axis losses were available but, with due allowance for exaggerated claims, it seemed reasonable to assume that the dead loss was certainly in excess of 1,000,000 tons.

In summary, the war on shipping was deadly serious. Its toll equalled or exceeded that exacted in 1940 and the rate of replacement of merchant tonnage was as yet not nearly adequate. But there was reason for real optimism. Losses in the Atlantic were definitely on the decline and, if American aid was not diverted in too large quantities to the Pacific, it appeared that the Battle of the Atlantic was well on its way to being won. Victory in the northern sea lanes meant, however, not ultimate victory but the survival of Britain. It was but a necessary prelude to ultimate victory.

Submarines in Naval Actions.— During 1941 both axis and Allied submarines took as their main objective their enemy's supply lines. Naval actions played a minor and incidental role and resulted in most cases only when an enemy warship chanced to come into the field of vision of a periscope which was primarily searching out merchantmen. In 1940 Britain expended considerable submarine effort in blockading axis ports and in hunting submarines with submarines. While it was probable that these activities were still practised to some extent, it became increasingly evident during 1941 that the admiralty realized greater damage could be inflicted by harassing the enemy's vital lines of communication. There were no real naval actions in which submarines played a part in co-operation with surface warships, although there were many isolated attacks on men-of-war, troopships and naval auxiliary vessels.

Early in January the British "Thunderbolt," which was the reconditioned and rechristened ill-fated "Thetis," claimed the sinking of an Italian submarine. A few days later the British "Tuna" engaged in a surface gun duel with a U-boat and claimed serious damage. In March the admiralty announced the sinking by submarine action of an Italian cruiser of the "Condottiera" class, while under escort of two destroyers. Late the same month Germany stated that U-boats were working in co-operation with the battleships "Scharnhorst" and "Gneisenau" in a new raiding technique; this seemed to be the one case of the year of co-ordinated submerged and surface attacks, but as it was aimed at the shipping lanes it could scarcely be termed a naval action. Since the nazis claimed the sinking of only 30,000 tons, it was certainly not a great triumph.

In April the British admitted that the light cruiser "Bonaventure" had been sunk by a U-boat while on escort duty. Later this month during the brief fighting in Yugoslavia occurred, not strictly a naval action, but one of the most daring submarine exploits of the war. The British submarine "Regent," dodging minefields and with the White Ensign flying, put into the Yugoslav port of Cattaro in search of the fugitive British minister to Belgrade. Capturing an Italian officer and holding him as hostage, the commanding officer sent his mate ashore to search the city. Finally discovered by aircraft, he was heavily bombed but fought off his attackers for some time. After nine hours he was forced to submerge and pick his way to the open sea without having accomplished his mission.

In late June the neutral Turkish ship "Refah," transporting naval personnel, was torpedoed and sunk close to Turkish territorial waters. While the assailant was not positively identified there existed strong reasons to believe it was Italian. In early July the admiralty claimed that a British submarine had sunk an Italian heavy cruiser, probably the "Gorizia," as well as three anti-submarine craft; this was vehemently denied by the fascist high command. Late that month the nazis asserted the U-boat sinking of a British destroyer and corvette on convoy duty. Early in August the British claimed the torpedoing of an Italian light cruiser and a floating drydock by their submarines, but failed to verify that these had been sunk. Germany in late August again claimed the submarine sinking of a destroyer and a corvette while acting as convoy escorts, and Britain countered with an assertion, unverified, that a fascist submarine had been sunk by a British submersible.

In September the British light cruiser "Hermione" reputedly chanced upon an Italian submarine on the surface, rammed it and cut it in half; fascist headquarters retaliated with the assertion that the unfortunate submarine must have been British rather than Italian. About the same time Germany stated that 65 Russian transports and 27 warships had been sunk in the Finnish gulf during the preceding week, probably by aircraft and submarines combined; the types of warships were not mentioned, which led to the belief that no major units were lost. Soon after this the soviet high command announced the capture of a U-boat in the Barents sea, and London followed up with a report of the capture of another by a bombing plane assisted by destroyers. The month ended with a British statement that during September their own and Dutch submarines had destroyed, besides numerous merchantmen, two Italian destroyers.

Early in November the admiralty admitted the loss of the destroyer "Cossack," of "Altmark" fame, probably by submarine attack. But the outstanding submarine naval achievement of the year came later in the month when the hitherto unsinkable aircraft carrier "Ark Royal" met its fate at the hands of a U-boat within a few miles of the safety of Gibraltar. Berlin also claimed that the newly repaired battleship "Malaya" was struck in the same attack and severely crippled, and it appears probable that U-boats were lurking in the vicinity for the particular purpose of intercepting these ships. The admiralty denied any serious damage to the "Malaya."

Following this blow and until the end of November submarine actions were plentiful. Britain asserted that two cruisers, one destroyer and several supply ships had been eliminated from the diminishing Italian navy by submarine and aircraft torpedoes; the Canadian navy minister reported that two Canadian corvettes had engaged and sunk a U-boat; Berlin claimed that a U-boat, probably operating from a Greek base, had torpedoed a British battleship at Salum on the Egyptian frontier; the Royal navy submarines "Tigris" and "Trident," operating in the Barents sea, reputedly sank at least eight strongly protected German transports and supply ships en route to Murmansk.

In early December a British submarine was reported to have attacked three Italian cruisers in the central Mediterranean, and one was believed to be sunk; shortly thereafter the remaining cruisers were subjected to a fatal attack by British and Dutch destroyers which were probably directed to their prey by the submarine. In mid-December the admiralty announced the loss of the light cruiser "Dunedin" in the Atlantic, by U-boat action, and at about the same time the cruiser "Galatea," near Alexandria, was struck by three submarine torpedoes and sank immediately. A week later the nazi high command announced the sinking of a British aircraft carrier in the Atlantic by a U-boat, but there had been no confirmation of this loss. At the year drew to a close British sources admitted the loss of the destroyer "Stanley" and the auxiliary catapult ship "Audacity" (ex-German "Hannover") in submarine attacks on a North Atlantic convoy.

Soviet Submarines.—The nazi attack on an erstwhile friend, Russia, brought strong new submarine forces into action, but it is doubtful whether they were so placed as to have any immediate effect on the war. The soviet navy had concentrated on building a submarine fleet large in numbers but of unknown capabilities. While definite information was lacking, it was believed that Russia entered the war with between 200 and 300 undersea craft, mostly small types for work in coastal waters. Probably one-third of this fleet was based on Vladivostok, far from the theatre of action, the remainder being divided between the Gulf of Finland, the Black sea and the White sea. No news of soviet submarine actions in the Finnish gulf had passed the rigid censorship but the presence of many nazi warships and troopships in this area during the encirclement of Leningrad presented many opportunities for attacks and it is unlikely that they were entirely missed. The only definite reports from submarines operating from Archangel came in late November when the Russians claimed the sinking of three nazi troopships in the Barents sea. At year's end the Black sea was still closed to the Germans, and soviet submarines there had had no opportunity to prove themselves.

United States Ships Attacked.—Early in the summer began a series of promiscuous attacks on nonbelligerent shipping, especially that flying the United States flag and that which was under the flag of Panama although United States owned. In September these attacks were extended to naval vessels and the United States was brought to the verge of war with the axis powers. On Sept. 4 it was announced that the destroyer "Greer" had been attacked but not hit while trailing a submerged U-boat. A counter-attack was proclaimed as probably successful but, since Berlin stated it had later reports from the submarine, this is doubtful. In mid-October the destroyer "Kearny," while assisting to beat off an attack on a convoy, was torpedoed but not sunk near Iceland, with 11 casualties. Official nazi quarters denied this attack but claimed to have sunk two British submarines at about the same time and place; however, the attack occurred during darkness and it is probable that the "Kearny" was tallied as one of these. At the end of October the U.S. destroyer "Reuben James" was torpedoed and sunk with great loss of life near the positions of the former attacks. Diplomatic protests now came to an end and action took the stage.

War in the Pacific.—On Dec. 7 occurred the unprovoked and unexpected Japanese air raid on Pearl Harbor, involving the United States in war on two oceans, spreading the conflict around the globe. New and powerful submarine flotillas became engaged in the conflict. The United States had well over 100 submersibles ready for action and Japan was known to have at least 70 modern boats, probably many more. A minimum of a dozen Dutch submarines were operating from the Netherlands East Indies, and the 70 or more Russians at Vladivostok remained a distinct threat. The first submarine action occurred in conjunction with the attack on Pearl Harbor when Japanese "baby" submarines penetrated the innermost defenses; while the damage inflicted on United States naval craft by this means was unknown it was probably relatively light and it was doubtful if any of the submarines that entered were able to escape. Within a week Dutch submarines were in action in Malayan waters against Nipponese troop convoys and claimed to have bagged four heavily loaded transports. In mid-December Admiral Hart, commanding the U.S. Asiatic fleet, reported successful submarine actions on two Japanese transports and one destroyer. Further reports of successes were anticipated as submarines returned from extended patrols.

Submarine Losses.—With the sole exception of Britain no belligerent power makes a practice of announcing its submarine losses. Nor do any of them, except in unusual circumstances, announce the losses they believe they have inflicted on their adversaries, for the stated reason that secret sinkings have a more deleterious effect on enemy morale than those broadcast to the world—a case where ignorance is not bliss. Any attempt, therefore, to estimate aggregate losses is pure guesswork, based only on such hints as occasionally emanate from those in a position to know. With these apologies the following is submitted.

Germany.—The nazis have admitted not a single sinking. Estimated 1940 losses were at least 60 but, considering Churchill's statement in April 1941, that there had been 74 verified sinkings until then, this estimate appeared to be an underestimate, for there is a wide gap between verified sinkings and actual sinkings. Press reports contained items concerning the loss of only 23 U-boats during 1941, but such reports were made only when the circumstances were exceptional. A further hint was contained in a November statement by the admiralty that a total of 1,276 submarine survivors had been captured. If entire crews were taken prisoner this would roughly indicate that 30 submarines had been destroyed, but it must be remembered that in most cases only a few members of the

crew can be saved and that in the majority of cases there are no survivors. Using captives as the best available figure on which to base an estimate, and generously computing that one-third of each crew was rescued, it would appear that at least 90 submarines were sunk from which survivors were captured. Figuring further that less than half of those sunk yielded prisoners it seemed reasonable to assume that at least 200 German and Italian submarines were sunk in 1941. The year ended with an admiralty statement announcing that nazi losses were so heavy that great difficulty was being experienced in getting and training U-boat crews.

Italy.—The press reported only five submarine losses by Italy in 1941 and only one of these was officially admitted by the fascists. Lacking other figures, Italian losses were included in the preceding paragraph with those suffered by Germany, based largely on numbers of prisoners taken by the British. In view of the depletion of its flotillas it is probable that Italy's 1941 losses were about the same as in 1940—an estimated 20 submarines.

Japan.—One large submarine was known to be sunk off Hawaii early in December and another off the Pacific coast shortly thereafter. President Roosevelt announced on Dec. 8 that "a number" had already been smashed and Secretary of the Navy Knox followed this up on Dec. 22 with a statement that "several" had been "dealt effectively with." It seems reasonable to assume that at least six were destroyed before 1942. In addition to these Japan admitted the loss of five "baby" submarines.

Great Britain.—Although announcements were considerably delayed, the admiralty consistently reported the loss of its submarines. Experience has shown that admiralty admissions of naval losses were correct and the writer knows of no reason to doubt its submarine figures. In September announcement was made of the 31st submarine loss of the war, this being only the ninth of the year. There were no more reports (indicating perhaps that these candid admissions were at an end), but assuming that losses continued at the same rate a total of 12 during 1941 is estimated. This considerable reduction over 1940 may be due to different methods of employment; submarines were being kept on enemy lines of communication rather than on blockade duty off heavily mined enemy ports. With British losses might be included the admitted destruction of the Free-French submarine "Narval" by Italian naval action and the loss of one Dutch submarine in a minefield, for these were operating under the Royal navy.

United States.—The navy department admitted no losses. Japanese officialdom, however, claimed to have destroyed nine enemy submarines, nationality unstated. If true, it may be assumed that the majority of these were American.

Russia.—Submarine news from Russia was almost totally lacking. The nazis, however, claimed to have captured four undamaged soviet submarines in a Latvian port and to have destroyed "a number" by bombing in the Black sea. In the naval actions near Kronstadt there were undoubtedly other losses, but there was no indication that the Russian flotillas suffered heavily.

New Construction.—*Germany.*—During the winter of 1940–41 the usual alarming reports emanated from Sweden and Switzerland on the rapid rate at which German yards were producing submarines. In February it was rumoured that 600 U-boats were ready for the spring offensive, although admittedly many of them were of the so-called "minnow" type. Such a number would not be in excess of nazi boasts but it was considered doubtful in view of subsequent events that they were actually in existence. In fact some naval authorities placed the total number of U-boats in commission at the start of the spring drive as low as 180. The truth must lie between the two figures, but it was at least clear that Germany had never reached its vaunted rate of "a submarine a day" in spite of vastly increased production facilities resulting from the occupation of conquered countries. Available information indicated that nazi submarine construction ran to two principal types: (1) a large U-boat, over 1,000 tons, with high surface speed and long cruising radius for striking in distant waters; (2) the "minnow" type, 250–300 tons, 13 knots surface speed and with but three torpedo-tubes, for work around the British Isles and in coastal waters. The latter requires less than half the crew of the former and since there was a great scarcity of trained submarine personnel, this undoubtedly was a factor in determining the number of each type to be constructed. A new type, specially adapted to the new tactics described in the following section, appeared in numbers. While no detailed data were available, they were said to be 500 to 800 tons with a range of 8,000 to 10,000 mi., at least 18 knots surface speed, high manoeuvrability and heavier protection against gunfire than is usual in a submarine.

Italy.—Little was known of Italian submarine construction and it was doubtful, in view of heavy fascist losses and lack of material and skilled labour, whether it was keeping pace with sinkings. In September Italian authorities claimed that "small secret assault boats" which were little more than man-carrying torpedoes had sunk several supply ships at Gibraltar. The Italians had previously demonstrated a genius for submarine eccentricities so it is possible that these boats were also submersibles.

Japan.—For years the Japanese had put forth no information on naval construction of any kind. It was known, however, that submarine building went on rapidly and that they were producing many large, long-range craft capable of a round-trip to the shores of America. Japan, like Italy, goes to extremes, as witness the use of two-man submarines at Pearl Harbor. These tiny weapons are but 41 ft. long, propelled entirely by storage batteries, with a top surface speed estimated at 24 knots and a range of 200 mi. at low speed. They carry two 18-in. torpedoes plus a suicidal charge of high explosive under the stern. It had been known for several years that such craft were in existence, but since they require the attendance of a mother-ship at any distance from home shores they have distinctly limited capabilities and are in the nature of special weapons. In view of the restricted industrial facilities of Japan it was doubtful if a rate of submarine construction could be maintained that would offset expected losses.

Great Britain.—British submarine construction is likewise a closed book during wartime. Never a strong advocate of the submarine as a weapon, it is doubtful if Britain was replacing much more than her losses, in spite of valuable services rendered. One reason for this was, of course, the urgency of constructing cargo carriers and antisubmarine craft with consequent use of all available shipways. Reports indicated that the admiralty was specializing in smaller and simpler submarines than heretofore, for use in the Mediterranean and other narrow seas.

United States.—There was a greatly accelerated rate of construction in the United States from 1939 on and submarines were being launched at the rate of several a month. The majority of these were large modern vessels (1,500 tons) with a heavy torpedo armament and enough range to carry the war to Japan. There were also building a number of smaller, simpler ships (about 800 tons) for more limited use. It seemed probable that the building rate would be greatly stepped up during 1942.

Russia.—There has always been much secrecy and much conjecture regarding the soviet program. About all that is known is that the Russians specialized in this type of naval weapon, and that they ran to numbers rather than to size. Most of their submarines were believed to be small short-range craft, some of which even approached the "baby" submarines of Japan.

Aside from the new German type for night surface attacks and the Japanese two-man boat, there were no outstanding developments in submarine construction during the year. Radio and supersonic listening devices were greatly improved, but such improvements were of more help to the anti-submarine craft on the surface than to the submarine below the seas.

Submarine Tactics.—The German high command several times during the year hinted the employment of new submarine tactics and on two occasions spoke of co-ordinated attacks on convoys by surface warships and U-boats. No details of such collaboration were available but the results of these attacks were in no way alarming.

The "wolf-pack" tactics developed in 1940, however, were improved upon. From such information as was gleaned from meagre reports it appeared that far-ranging nazi aircraft spot and trail a convoy and, by radio, converge all nearby U-boats on its path. In the western Atlantic a submarine substitutes for the plane, trailing the convoy just outside the range at which it can be sighted. When the wolves are on the scent they follow, on the surface but unseen, during daylight, and at night go in to the kill. One U-boat starts the attack on signal and the others follow in succession throughout the night. While most attacks are from the flank and torpedoes are fired at random into the mass of merchantmen, an occasional daring skipper goes directly through the convoy, firing to port and starboard until his torpedoes are expended. Upon completion of the attack the U-boat submerges to escape counterattack; when danger is past it emerges and, with its superior speed, takes station for attack the following night. Such attacks sometimes last for several days. For this purpose was the new type of submarine, described in the preceding section, designed; it is in reality a low, fast torpedo boat, capable of submerging when necessary.

Combatting such tactics is difficult. The assailants are hard to see and harder to hit, and they disappear when attacked. Increase in numbers of escorting vessels is a help, but the real answer appeared to be the inclusion of an aircraft carrier in the convoy. With an air patrol around the merchantmen during daylight, trailing observation planes could be driven off and U-boats on the surface en route to their night stations could be forced under, effectively preventing their arrival on position in time to be of use. That the British were already making use of this countermeasure was verified by announcement of the loss of an auxiliary aircraft carrier, a former merchantman, from a convoy.

Another new German development was the probable use of submarine tenders in isolated arctic seas, making it possible to use the smaller type U-boats against the sea lanes of the western North Atlantic, out of range of air patrols from the United Kingdom. These small boats would normally be unable to range so far to westward, but the presence of a mother-ship from which to re-fuel and re-victual extends their radius of action sufficiently to warrant their use in these waters.

Strategically, it is worth while to note the undoubted use of Dakar as a nazi submarine base. It was reliably reported that at least a dozen U-boats, although flying French colours in port, were operating from there against convoys from Freetown and the Cape of Good Hope with the object of cutting one more vital life-line to Britain. The providing of heavy escorts at such a distance from British naval centres is a problem of considerable magnitude. (*See* also BLOCKADE; INTERNATIONAL LAW; NAVIES OF THE WORLD; NEUTRALITY.) (E. E. HA.)

Sudan: *see* ANGLO EGYPTIAN SUDAN; FRENCH COLONIAL EMPIRE.

Suez Canal.

The Suez canal is a link in the shorter of the two lines of communication between Great Britain and the east—the Mediterranean and the cape routes. Its strategical character is twofold and lies in the advantages its use confers, and the disadvantages which its use by an enemy would impose, upon the British empire. The importance of time in war, the need for the most effective use of shipping tonnage, the strategical necessity for economy in the employment of fighting forces—all of these combine to establish the superiority of the Mediterranean over the cape route: thus, the voyages from England to Bombay, Yokohama and Melbourne via Suez are respectively 42%, 23% and 8% shorter than by the cape route. It is, however, essential to bear in mind that the canal is only a link in the chain of communications, and unless the other links by which it is approached—the Mediterranean and Red seas—are also secure for traffic, the canal is isolated and can serve no

positive purpose. The essential corollary therefore to a diplomatic policy of holding the waterway is a naval policy which ensures a strength adequate to protect the waterways of approach.

The canal could serve the purposes only of an enemy who should hold Egypt. But the fact of his holding that country and its neighbour Palestine would imply his command of the sea and the expulsion of the British fleet from its bases in the Levant. The possession of the canal would then put it in its power to send armies and sea forces to the south and to maintain them from its European sources. The East African colonies would be exposed to most powerful attacks by land and sea, the trade of the Indian ocean subjected to injury by ships operating from bases in East Africa, and even the alternative route to India and Australia via the cape would be threatened. It was the fact that the German cruiser operations in World War I were hampered by a want of oversea bases, and that the possession of African bases would tend to curb the opposition of Australia and India to German expansion in the east, that German naval authorities in 1916 urged the importance of acquiring colonies in Africa.

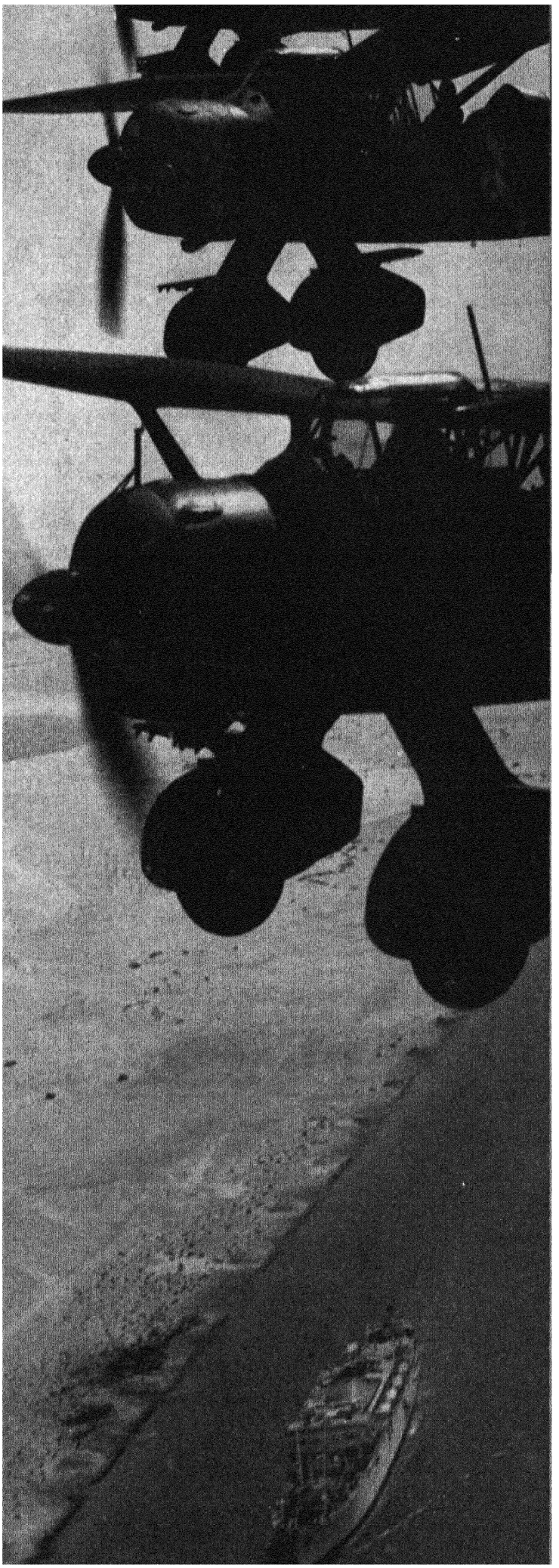
Though the Suez canal was neutralized by the convention of 1888 which established that there should be freedom of movement for all shipping in time of war and forbade the commitment of any act of hostility in the zone, two signatories to that convention, Germany and Turkey, broke the engagement and attacked the canal in Feb. 1915. The ineffectiveness of agreements unsupported by force has been made manifest in other ways, and Great Britain's treaty with Egypt of Aug. 26, 1936, while recognizing the full independence of Egypt, recognized also the British interest in the security of the Suez canal and a British right to maintain there a garrison of 10,000 troops and a force of aircraft. Under modern conditions of warfare the navigation of the canal is capable of being interrupted from a distance by aircraft laying mines, directly attacking ships, and also blocking the waterway. Though the constantly increasing range of aircraft brings almost all the Mediterranean countries within striking range of the canal, it is still important to keep them at the greatest distance possible, since distance diminishes the intensity of attack and increases the powers of defense. (H. W. Ri.)

Suffolk and Berkshire, Charles Henry George Howard,

Earl of (1906–1941), British scientist, was born March 2. He was a fellow of the Royal Society of Edinburgh, 1936, and won first class honours in pharmacology, 1937. In the early part of World War II, the earl acted as the British supply ministry's liaison officer between British and French scientific organizations. After the fall of France the earl volunteered to conduct experiments on unexploded time-bombs dropped on London by nazi raiders. He headed a "suicide" crew that successfully extricated a number of these bombs from London ruins, but one of the delayed-fuse missiles exploded in London May 12 killing the young peer. He was awarded posthumously the George cross for conspicuous bravery.

Sugar.

The need for diverting sugar to the manufacture of high-test molasses to be made into alcohol, essential in the manufacture of smokeless powder, was one of the two principal reasons the U.S. government, beginning Dec. 13, 1941, ordered restrictions on the consumption of sugar in the United States. The other reason for freezing all stocks held by wholesalers, jobbers and industrial users, and subsequently adopting per capita rations, was that the war with Japan had cut off normal supplies of sugar from Hawaii, the Philippines and other Pacific



R.A.F. PATROL PLANES over the Suez canal in 1941

sources. Also, the general shortage of shipping interfered with normal receipts of sugar from Cuba and other Caribbean sources. The OPM restrictions limited 1942 consumption in the United States to the consumption of 1940, which was 6,890,000 short tons. Restrictions forbade any receiver to take, in any month, more than a 30-day supply of sugar. In the latter part of 1941, the U.S. government began negotiations to buy all Cuban sugar and molasses above Cuban consumption requirements. On Dec. 18, 1941, congress extended the Sugar act through 1944 and raised conditional payments to producers from 60 to 80 cents per 100 lb. of recovered sugar in production up to 350 tons, with graduated reductions in payments on production above 350 tons. Only two or three years previously the huge annual over-production of sugar was one of the most difficult problems in world trade. To help equalize that situation and to protect sugar growers in the United States and insular possessions, the U.S. government adopted annual quota allotments of imports from Cuba, the Philippines, Hawaii, Puerto Rico, the Virgin Islands and a small amount from other countries. But at the end of 1941 practically any amount from any source was welcome. Estimates of the Philippine sugar crop in 1941 were 1,092,000 tons, compared with 1,053,228 tons in 1940; Hawaii, 968,800 tons in 1941 and 968,912 tons in 1940; Puerto Rico, 931,997 tons in 1941 and 1,018,793 tons in 1940. The 1941-42 production in Cuba was expected to be around 3,600,000 tons. Cuba shipped about 2,800,000 tons to the United States in 1941. In the United States, production of sugar-cane in 1941 was estimated at 5,063,000 short tons, with a sugar yield of possibly 431,000 short tons, raw value 96°. The preceding year's harvest was 3,797,000 tons of cane and 332,000 tons of sugar; the ten-year (1930–39) average was 4,362,000 tons of cane and 355,000 tons of sugar, all grown in Louisiana and Florida. Louisiana production was 3,978,000 tons of cane; Florida, 1,085,000 tons of cane. Sugar-beet production in the United States in 1941 was 10,090,000 short tons, about 18% less than the record 1940 crop of 12,292,000 tons. The ten-year average was 9,284,000 tons. Beet sugar manufactured in 1941 was 1,451,000 tons, equivalent to 1,552,570 tons raw value. In 1940 it was 1,773,000 tons (1,897,000 tons raw value); the ten-year average was 1,363,000 tons (1,458,000 tons raw value).

U. S. Production of Beet Sugar by States, 1941 and 1940

State	1941 short tons	1940 short tons	State	1941 short tons	1940 short tons
California . . .	311,000	466,000	Wyoming . . .	78,000	93,000
Colorado . . .	290,000	313,000	Utah	74,000	74,000
Michigan . . .	151,000	168,000	Ohio	42,000	45,000
Montana . . .	120,000	163,000	Other states . .	155,000	191,000
Nebraska . . .	116,000	115,000			

(*See* also BEE-KEEPING; MAPLE PRODUCTS; SYRUP, SORGO AND CANE.) (S. O. R.)

Suicide Statistics. In 1939, the latest year of record, there were 18,511 deaths from suicide in the United States, corresponding to a death rate of 14.1 per 100,000 of total population. The most current picture of the situation is obtained from the records of industrial policyholders of the Metropolitan Life Insurance company whose experience follows closely that of the general population of the United States. According to this insurance experience, the death rate from suicide for the first nine months of 1941 was 12% lower than that for the corresponding period of 1940. The decrease in suicide mortality reflects, in large degree, the improvement in business conditions, for there has been found to be a very close inverse relationship between the two.

Since data were not available to show the effect of World War II on suicide in the nations in conflict, a brief review of earlier experience may be pertinent. During periods of war, there is usually a pronounced decline in suicide mortality, not only in belligerent countries, but also in neutral nations. Thus, during World War I, suicide rates in the principal countries fell without exception. A study of Massachusetts and Connecticut data established a decline in suicide mortality during the Civil War of the United States. In the course of the Franco-Prussian War (1870–81), the deaths from suicide in France were fewer than the average for the four preceding years. The decline in suicide during war is found among women as well as men, although it is more marked among the latter.

A recent study of "suicides that failed" showed that more women than men attempt self-destruction, but that men are much more resolute in their efforts than women. Although suicidal attempts are rare under 15 years of age, more than one-half of the total attempts by women were made under the age of 30, according to this study, while among men, the proportion for the same ages was one-quarter. Attempts at self-destruction were more successful at the higher ages than at the younger. Thus, it was found in this study that among men at ages under 25, one-sixth of the attempts resulted in death, while at ages 50 and over the ratio was two out of three. For women at ages under 25, one attempt in every 18 ended in death, but at ages 50 and over, the purpose was accomplished in one-half of the attempts. White persons in the United States are more likely to attempt suicide than the Negroes.

Although motives for suicide cannot be stated with definiteness, it has been found that lack of interest in life, poor health, domestic difficulties, or financial troubles usually precede attempts at self-destruction.

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(A. J. Lo.)

Sulphur. World production of sulphur in 1940 was 3,700,000 metric tons, 75% in the United States, 10% in Italy, 4% in Japan, and 2% each in Spain, Chile and Netherlands East Indies. Production in the United States in 1940 increased 31% to 2,732,088 long tons, while shipments increased 15% to 2,558,742 tons. Imports practically ceased, but exports steadily expanded and reached 766,213 tons in 1940, 746,468 tons of crude and 19,745 tons of refined. Shipments to Great Britain and Canada more than doubled since 1938, the two accounting for about two-thirds of the total. Domestic consumption in 1940 was estimated at 1,848,000 tons, up 16% from 1939. Sulphur was in 1941 being recovered in elemental form from smelter gases in a number of countries, but nothing was known as to the magnitude of the recovery, and the extent to which this by-product replaced native sulphur. (G. A. Ro.)

Sumatra. Lying northwest of Java (*q.v.*) and adjacent to the Malay peninsula, from which it is separated by the narrow Strait of Malacca, Sumatra is after Java the richest, and after Borneo (*q.v.*) the largest, of the islands of the Netherlands Indies archipelago. Area, 182,900 sq.mi.; pop. (1931) 8,254,843. It is almost bisected by the equator, lying between 5° 4′ N. and 5° 59′ S. The interior is mountainous and wooded; the two highest mountains are Mount Indrapura, with an elevation of 13,700 ft., and Mount Ophir, with an elevation of 10,483 ft. There are some fertile and well-watered lands along the coast. The natives specialize in the cultivation of rice and there are European rubber and coffee plantations. Sumatra's mineral resources include gold, silver, coal and oil. Sumatra is divided into ten Residencies, or administrative units. There has been an effort to promote migration from Java, which is only about one-third as

large and has more than five times as many inhabitants; the government appropriated funds to help the settlers, especially young married couples. The Palembang district was especially favoured for this assisted migration. Sumatra also shared in the program of industrialization which was launched for the East Indies after this great colonial empire was cut off from the Netherlands by the German occupation of the latter country. The program called for the building of oil refineries, bauxite smelters, aluminum factories, a chemical plant and a paper mill. (*See* also NETHERLANDS COLONIAL EMPIRE; DUTCH EAST INDIES.) (W. H. CH.)

Sunday Schools.

The International Congress on Christian Education, held in Mexico City, Mex., July 16–20, 1941, under the auspices of the World's Sunday School association and the National Council of Evangelical Churches in Mexico, assembled 508 delegates from Mexico and 454 delegates from other countries, including Guatemala, Honduras, Nicaragua, Argentine, Brazil, Chile, Uruguay, Paraguay, Peru, Canada, the United States of America, Cuba, Puerto Rico, the Dominican Republic, Egypt, the Belgian Congo, the Gold Coast of Africa, Burma, China, Korea, and the Philippine Islands. The proceedings of the congress were published in English and in Spanish. It was preceded by a smaller Conference for Sunday School Workers held at Cuernavaca, July 13–15, and followed by a Conference on Christian Literature for Latin America, July 21–25.

The congress noted as reasons for encouragement: increased Sunday school attendance in many countries; increased recognition that religious education is an integral part of the work of the church; increased interest in the reading and study of the Bible; a mutual approach of evangelism and Christian education; the greater extent to which preparation for service in Christian education is being included in the training of ministers in theological schools; the development of education for lay service of various types; and increased interest of youth, where free, in religion. It recognized the need for better curriculum materials, better prepared teachers, and more effective provision for the underprivileged, including the great number of people who cannot read.

In countries occupied by Germany, Christian youth conferences were forbidden in many places, but Sunday schools were being conducted in the homes of people. In spite of war, the work continued effectively in China, under the direction of the National Committee for Christian Religious Education, which celebrated its tenth anniversary in July. Madame Chiang Kai-shek, one of the vice-presidents of the World's Sunday School association, sent a heartening message to the International Congress at Mexico City. (*See* also CHURCH MEMBERSHIP.) (L. A. WE.)

Suñer, Ramón Serrano: *see* SERRANO SUÑER, RAMÓN.

Superphosphates.

The production of superphosphates in the United States in 1940 was 4,522,175 short tons, and shipments 4,820,571 tons, increases of 14% and 7% respectively over 1939. Imports were negligibly small (10,017 tons in 1940), but exports were somewhat larger, 141,289 tons in 1940, against 95,224 tons in 1939. The consumption of phosphate rock in the production of superphosphates in 1940 was 2,564,844 tons, or 64% of the total output. (G. A. RO.)

Supersonics (Ultrasonics): *see* METALLURGY.

Supply Priorities and Allocations Board.

The Supply Priorities and Allocations board was set up by President Roosevelt Aug. 28, 1941, "in order to assure unity of policy and co-ordinated consideration of all relevant factors involved in the supply and allocation of materials and commodities among the various phases of the defense program and competing civilian demands." In the executive order which called the board into being, the duties of the board were outlined in this manner:

Consistent with the basic defense policies of the president, the Supply Priorities and Allocations board shall:

a. Determine the total requirements of materials and commodities needed respectively for defense, civilian and all other purposes; establish policies for the fulfilment of such requirements, and, where necessary, make recommendations to the president relative thereto.

b. Determine policies and make regulations governing allocations and priorities with respect to the procurement, production, transmission or transportation of materials, articles, power, fuel and other commodities among military, economic defense, defense aid, civilian and other major demands of the total defense program.

The executive order named the membership of the board as follows: Vice-President Henry A. Wallace (*q.v.*), chairman; William S. Knudsen and Sidney Hillman (*qq.v.*), respectively director general and associate director general of the Office of Production Management; Secretary of War Henry L. Stimson (*q.v.*); Secretary of the Navy Frank Knox (*q.v.*); Leon Henderson (*q.v.*), head of the Office of Price Administration and director of the division of civilian supply in OPM; and Harry L. Hopkins (*q.v.*), special assistant to the president. Donald M. Nelson (*q.v.*) was named executive director of the board.

At its first meeting, SPAB laid down for the national economy a general policy of "cutting off the fat and hardening the muscles," and stated that "production shall be stimulated and organized to the limit of the nation's resources." In subsequent meetings the board adopted a series of policy declarations designed to make the nation's defense effort effective. It ruled, for example, that expansion of productive capacity to meet purely civilian demand could not be undertaken if the expansion would require large quantities of critical defense materials; it called on military and civilian defense authorities for detailed estimates of military and civilian requirements as far in advance as possible; it directed that every effort be made to expand domestic production of all critical materials; it denied priority applications for material to build an oil pipe line from Texas to New York, holding that the materials involved were more greatly needed in other phases of the defense effort; and it undertook to provide the needed equipment to make possible expanded production of dairy products.

On Oct. 9, 1941, SPAB announced one of its broadest policy decisions, ruling that priorities assistance thereafter could not be granted for any public or private building construction project which was neither essential to national defense nor necessary for the public health and safety.

Subsequently, the board approved OPM proposals for a 10,000,000-ton expansion in steel production capacity, and directed OPM to develop an allocation system for steel. It followed that action by calling on OPM to obtain detailed production programs, industry by industry, for 1942, to the end that the most vitally needed materials could be distributed through an allocation program rather than through the system of issuing priority ratings.

At the request of the Economic Defense board, SPAB on Dec. 2, 1941 agreed to do everything feasible in order to make possible the delivery of 218,600 tons of tin-plate to other republics in the western hemisphere during 1942. Shortly thereafter it extended the principle set forth in the building construction policy to the fields of public and private electric power, holding in substance that no new projects should be undertaken unless they could be shown to be essential either for national defense or for the public health and safety, and that both public and private power bodies should be treated alike during the national emergency.

Disturbed by increasing reports of inadequate efforts to get the greatest possible production of copper, SPAB early in Dec. 1941 directed OPM to hold an inquiry on the subject and to submit to SPAB a report summarizing all suggestions regarding methods of increasing production.

On the day that the United States declared war on Japan, SPAB called for "a vastly expanded national effort" and laid down the rule that the nation must strive for "the greatest production which is physically possible." It followed this action immediately by making an extensive survey of all critical raw materials coming from the Pacific area, and by setting in motion a program designed to ensure adequate military production even in case further shipments of such materials should be cut off by enemy action. On Dec. 26, 1941, the sale of new tires for pleasure cars was prohibited by the Office of Price Administration, to conserve the nation's supply of rubber.

SPAB was set up as a policy-making body rather than an administrative agency. In general, its activity took the line of setting broad policies to be followed by OPM and other defense agencies; of charting the course by which actions affecting production and supply were to be taken, and of stating principles to guide the civilian phase of the defense effort. (*See* also DEFENSE, NATIONAL; PRIORITIES; and the various articles on related defense agencies (PRODUCTION MANAGEMENT, OFFICE OF, etc.) (D. M. N.)

War Production Board.—President Roosevelt announced on Jan. 13, 1942 that he would establish, by executive order, a War Production board to

take over the functions of the SPAB, which was to be abolished with the creation of the new board. He appointed Donald M. Nelson to head the new board and announced that Nelson's decision on all questions of production and procurement of U.S. arms would be "final." Thus the administration met the long-standing demand for the appointment of one man with absolute control over the arms program—the same control that Bernard Baruch exercised in the War Industries board during World War I.

Supreme Court of the United States. The year 1941 was one of the most momentous in the history of the supreme court, due not only to the shift in personnel, but also to the shift from an overwhelmingly conservative to a vestigially liberal bench.

The last of the old guard, Mr. Justice McReynolds, retired, as did the distinguished eleventh chief justice, Charles Evans Hughes. Death took the eminent liberal jurist, Louis Dembitz Brandeis (*q.v.*). To fill the two vacancies (Brandeis having retired in 1939), President Roosevelt appointed Senator James F. Byrnes and Attorney-General Robert Jackson to the court, bringing the total of the president's appointments to seven. Since the remaining two justices, the new Chief Justice Harlan F. Stone and Mr. Justice Roberts, had frequently upheld new deal statutes, President Roosevelt in 1941 had an almost unanimously sympathetic tribunal in the highest court of the nation.

Against this background it is not surprising that the new deal scored a number of victories; the power of congress to regulate wages and hours, despite a ruling to the contrary in an earlier case; the widening power of congress over activities which may be deemed essential to a nation's welfare even though such activities are purely local or intrastate; and the power of states to regulate trade in the public welfare despite a long line of cases which required that industries, before they could be regulated, must be (technically) affected with the public interest. Administrative boards, which had become the arbiters on national economic questions were judged and approved by the high court, and several dissents of yesterday became the law of the land today.

New appointees to the bench came from the political arena. Mr. Justice James F. Byrnes was an ardent new deal senator who had already indicated his belief that the constitution had been amended (1) in the manner specifically prescribed by the constitution; (2) by custom; and (3) by judicial interpretation. Mr. Justice Robert Jackson was attorney-general, to which post he was appointed from private practice. In his writings, particularly on the supreme court, he manifested a marked impatience with the emasculation of laws by the judiciary.

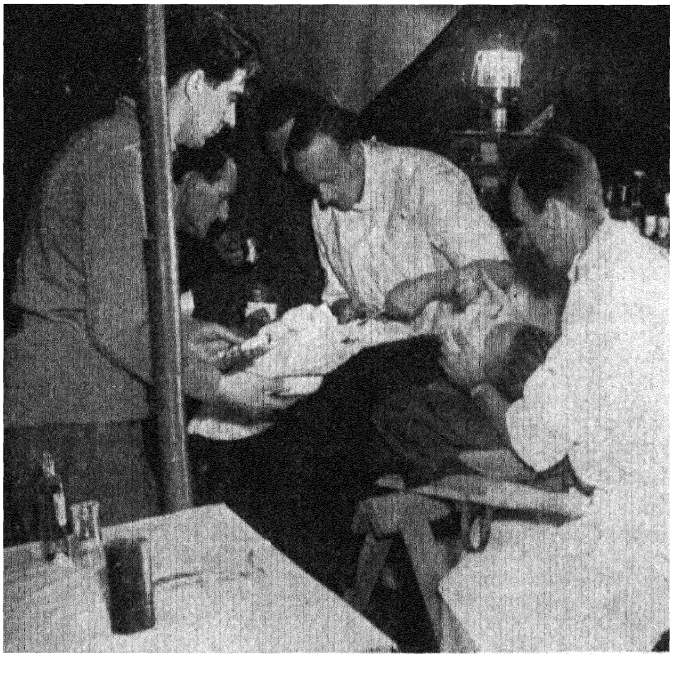
Work of the Court.—As for the work of the court, taxation and labour predominated in number. Constitutional and administrative issues loomed large in significance. On the whole the government prevailed, with a total of 88 cases won as against 28 lost. These were:

	For Govt.	*Against Govt.*		*For Govt.*	*Against Govt.*
Federal taxation . .	33	8	State taxation . . .	11	3
Federal labour . . .	8	3	State regulation . .	8	0
Federal regulation .	10	4	State criminal . . .	0	2
Federal criminal . .	7	3	State miscellaneous .	3	3
Miscellaneous . . .	8	2			
			Total	88	28

With the passage of the constitutional crisis in the supreme court and its settlement, there came to the court a unity which did not characterize that high tribunal in years past. While there were variant judgments in the application of principles and attitudes, there was a conspicuous absence of a "mortal clash of irreconcilable doctrines." The result, a liberal construction of those clauses which impose limitations upon congress or which limit the power of the states without regard to national needs. Perhaps one of the most significant aspects of the court's decisions was its evaluation of and regard for administrative agencies. Said Chief Justice Stone, "Courts are not the only agency of government that must be assumed to have the capacity to govern." "That means that judicial review performs its function when it vindicates the authority of the law and the decencies of fair procedure. Beyond this, the correction of errors of policy or of judgment is the business of the agencies which make them or of legislative reform."

Primary characteristics of the supreme court's work at its 1940–41 term, determined only from consideration of its written opinions were: (1) There were fewer instances than usual of constitutional cases, that is those involving questions of whether governmental action comported with the requirements of the federal constitution; (2) There was a larger number of decisions than in immediately preceding terms involving the construction and application both of federal and state laws; (3) There were fewer opportunities than ordinarily for the court to give expression to its views regarding civil liberties, but in the few instances the court maintained its record for protection of civil liberties; (4) An unusual number of opinions dealt with problems of the procedure and jurisdiction of federal courts; (5) An even more stringent limitation than heretofore declared was placed by the court on judicial review of administrative action. (*See* also CIVIL LIBERTIES; LAW.) (B. WE.)

Surgery. The widespread use of various sulphonamide compounds in the cavities of the body as a preventive against infection was introduced in 1941. In one series of cases of acute appendicitis in which perforation of the appendix occurred with local and sometimes general peritonitis, the mortality rate in those cases in which the sulphonamide preparations were introduced into the peritoneal cavity, as well as administered subcutaneously and orally, was half what it had been prior to their use. In cases of trauma to the skin or deeper structures and in the performance of plastic procedures of various types, after cleansing of the wounds and introduction of sulphonamide crystals a high percentage of primary healing occurred after suture. In this connection, too, new preparations were introduced—sulphadiazine and sulphaguanidine. The function of the latter was presumably to decrease the bacteria of the large intestine but this was not of appreciable benefit. It should be understood that none of



BRITISH FIELD HOSPITAL UNITS were rushed to the fighting front as empire troops advanced in the first Libyan campaign of early 1941. Here a surgeon operates on a soldier wounded at Bardia

THIS ENGLISH BOY, unable to talk one year after a severe head injury sustained in a 1940 air raid, was regaining his speech in 1941 following the removal of blood clots (subdural haematoma and subcortical haematoma) from the part of the brain that controls speech (Broca's area). The operation itself was one with which brain surgeons have long been familiar

the sulphonamide compounds should be used except under the direction of a practising physician.

Experience showed that in fractures of the neck of the femur (hip) the approximation of the broken fragments by various methods of metal fixation, such as long thin nails placed under roentgenoscopic control, has produced a much higher incidence of healing than when other methods were used. This so-called nailing method applied to certain fractures of other long bones also received some general and apparently justified acclaim, since it produced as accurate an approximation as possible under roentgenoscopic control and hence the period of healing by calcification was shortened.

An increasing series of cases in which penetrating wounds of the heart have been repaired successfully, with recovery of the patient and return to reasonable activities, was reported.

By opening the left pleural cavity and splitting the left side of the diaphragm, tumours of the lower portion of the oesophagus and the upper third of the stomach were made more accessible to surgical removal. After removal of the tumour the oesophagus and stomach are joined together by suture, and the incision in the diaphragm is closed around the stomach below the point of anastomosis. In several cases of this type the operation was performed successfully. (*See* also ANAESTHESIA; MEDICINE.)

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Surinam (DUTCH GUIANA). A Netherlands colony in northeastern South America. Area, 54,291 sq.mi.; pop. (1940) 156,332. In addition, an estimated 19,032 bush Negroes and 2,616 Indians live in the jungle. In 1937, 29·2% of the population was British Indian, 20·3% Javanese in origin. The chief cities are Paramaribo, the capital (54,853), and Nieuw Nickerie (3,788). Government is in the hands of an appointed governor and a partially elected council. Governor: Dr. J. C. Kielstra.

History.—The outstanding event in Surinam's history during 1941 was the arrival of U.S. troops Nov. 24, as the result of an earlier agreement between the United States and the Netherlands government in exile, with the object of providing necessary protection to the colony's valuable bauxite mines. The government of Brazil, in a corollary action, pledged itself to maintain military vigilance along the Brazil-Surinam frontier. The troops, whose numbers were not disclosed, were located in some 20 or more camps and acted solely in a military capacity. Their presence in no sense constituted an occupation nor was Netherlands sovereignty in any way infringed.

Education.—The colony had about 132 schools (43 government) in 1941, in addition to Indian and bush Negro schools in the jungle. In 1940, enrolment totalled 21,278, of whom 11,100 were in Paramaribo.

Finance.—The monetary unit is the guilder, officially valued in 1941 at 52½¢ U.S. and, after May 1940, tied to Netherlands Indies currency. Formerly, the colony's expenditures regularly exceeded revenues, necessitating a home government subsidy.

Resources and Trade.—Surinam is practically undeveloped except along the narrow coastal plain, which includes 150 sq.mi. devoted to agriculture and the bauxite deposits, with Moengo, on the Cottica river, the main centre of exploitation. Until July 1941, when a concession was granted to a Netherlands corporation, bauxite mining was entirely controlled by United States capital. Bauxite, first developed in 1922, is now the principal export commodity. Stimulated by war demands, production rose from 511,619 tons in 1939 to 615,434 tons in 1940, and by mid-1941 exports were running in excess of 100,000 tons monthly (Sept. 1941: 114,000 tons). All bauxite exports are taken by the United States and make up almost all United States purchases. Under normal conditions, around 65% of exports go to the United States; the proportion was 89.3% in 1940, however, and 92% in the first half of 1941. Other exports are sugar to Great Britain, balata to the United States and Great Britain, rice to the West Indies and miscellaneous foodstuffs. Imports, from the United States (57% in 1940) and the Netherlands (13.4%) were valued at 8,519,684 guilders in 1940, and comprised foodstuffs, fuel and manufactured goods. In the first half of 1941, exports were $2,405,353 in value (United States 92%), imports $1,275,015 (United States 65%).

Communication.—External communication is by steamship and air. Along the coast there are 13 km. of railway and fairly good roads. Interior communication is by rivers and trails. (L. W. BE.)

Swaziland: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

Sweden. A democratic monarchy of northern Europe. Area, 173,347 sq.mi.; pop. (est. 1940) 6,370,538. Capital, Stockholm (est. Dec. 31, 1941, 605,575). Other principal cities are Goeteborg (Gothenburg, est. 1940, 281,302); Malmoe (155,465); Norrkoeping (70,835); Haelsingborg (62,310). Religion, Lutheran Christian. Ruler in 1941: King Gustavus V (*q.v.*); prime minister: Per Albin Hansson.

History.—In 1941, Sweden's fundamental problem was neutrality. By the events of 1940 she had been virtually surrounded by the expanding German reich, and forced into a certain economic dependence. In many ways pressure was severe, especially when Germany attacked the U.S.S.R. in June 1941. The nazis demanded passage across Sweden of a division of soldiers from Norway to Finland; and the Swedish government felt it necessary to grant the demand, calling it an isolated instance, necessary to uphold friendly relations. As the months went on, tension increased between Germany and Sweden. Several times there seemed to be a nazi press campaign against the Swedes who, according to German papers, were blind to the advantages of the "new order." The Germans asked why Sweden sent only 1,500 volunteers to Finland in 1941, while in the war of 1939–40, before Germany took up arms against bolshevism, Sweden had sent her neighbour 9,000 men. The Germans objected to the still-free Swedish press. Certainly Swedish opinion was divided regarding the Finnish-Russian war, and the former foreign minister, Rickard Sandler, had to appeal to the people to "understand Finland and hope with Norway."

Among the peoples fighting the axis, condemnation of Sweden blended with envy and respect. Free Norwegians tried to be satisfied with the Swedish resentment against the execution of Norwegian labour leaders, and they were thankful for the prefabricated houses sent them. Britain opened a new cultural relations office in Stockholm, and the U.S.S.R. agreed to a settlement with Sweden on claims in the occupied Baltic states (May 30). Swedish diplomats fell heir to a vast amount of business representing Germany in Egypt, Iceland, Greece; representing the U.S.S.R. in Germany, Finland, Hungary, Italy, Rumania and Slovakia; and representing the Netherlands, Norway, Ice-

land and Hungary in many places. With the United States, relations were cordial but contact was difficult; however, ships did get through to carry 41,000 Christmas packages (largely coffee and dried fruit) to Sweden in Dec. 1941.

Economically, Sweden suffered severely despite her neutrality. The poor crops of 1940 were not compensated for by the 70% harvest of 1941; shipping was reduced to about 50% of normal activity; livestock had to be slaughtered because fodder was not obtainable (some fodder was made of pulp wood). The food situation was bad, though not desperate; the larder was cut 7% in 1940, and probably about 20% in 1941. Coffee was nearly gone in Dec. 1941, after a last ration of one pound per person for the previous four months. Food and clothing were also rationed, and a man often carried as many as 25 ration cards. The famous smörgåsbord was prohibited in restaurants. Marine losses were heavy. Five out of 20 ships that attempted to sail the Atlantic were lost; three destroyers were blown up in an apparent accident; three steamers with cargo were confiscated by the Germans in Norwegian waters during the 1940 invasion. Also the beautiful "Kungsholm" was taken over by the United States and the reconstructed "Stockholm" was sold to Italy because no safe-conduct could be obtained to bring her home.

On the credit side of the ledger stood the completion of the Falsterbo canal in southern Sweden. This waterway, together with 20 mi. of dredged channel, permits Swedish vessels to pass from the North sea to the Baltic inside Swedish territorial waters and thus avoid German mine fields. Although pig iron was decreased in 1941 (because of shortage of coal) and rubber was short, the aluminum supply was sufficient, lubricants were being made from tar, copper production was up and iron ore maintained itself. Some 100,000 vehicles ran on wood or charcoal gas, and one ingenious baker ran his trucks on alcoholic vapour from bread dough. United States films were still getting through, and Sweden was creating a reserve of medical and other emergency supplies valued at more than 400,000,000 kronor.

Treaties were made for the commerce of 1942, providing *e.g.*, for a purchase of 50,000,000 kr. of goods from Norway. With Germany a treaty was made, carefully regulating the exchange so that no direct state credits were granted, and so that Germany should pay off her deficit of 100,000,000 kr. for 1941.

A critic of the compromises of Swedish sovereignty called the land "a country on vacation." If so, it was a tense and active vacation, with everyone professedly on the alert to man the guns if his neighbours took the one step too far.

Education.—In 1937-38, there were 567,579 pupils and 27,858 teachers in the elementary schools, and 90,087 students in secondary schools. In the five universities, 7,606 students were enrolled in 1940. Sweden's budget for educational expenses in 1941-42 was 256,387,000 kronor.

Defense.—Figures on defense were not available after the outbreak of war. Prior to Sept. 1939 the following facts were valid: All men 20–45 were liable to conscription. The infantry consisted of 20 regiments and one corps; cavalry of four regiments, artillery of seven regiments, the *Train* of four corps and the *Intendance* of three companies. The navy took about 5,000 annual conscripts and had a permanent body of about 5,500. On Jan. 1, 1941, the navy possessed eight coast-defense ships, two cruisers, ten destroyers, 21 torpedo boats and 16 submarines. The air force had not in 1938 reached its quota of 255 officers, 175 noncommissioned officers and 1,015 enlisted men. At the end of 1941, 16 squadrons were being planned. Total estimated expenditure for defense in 1940–41 was 2,055,206,000 kr., as compared with an average expenditure in the years 1931–35 of 122,601,600 kr.

Finance and Banking.—The monetary unit is the krona (26 U.S. cents at par, 23.94 cents on Nov. 8, 1941). Revenues, 1940–41, were 2,029,162,000 kr.; expenditures were estimated at 1,555,871,700 kr. The national debt on Dec. 31, 1940 was 4,518,002,412 kr. In 1940 there were 28 private banks with deposits of 4,793,477,000 kr.

Trade.—In 1940, exports amounted to 1,337,936,000 kr. (1,889,112,000 kr. in 1939) and imports 1,999,266,000 kr. (2,498,685,000 kr. in 1939). The chief articles of export in 1939 were paper and manufactures (500,466,638 kr.); iron and steel (269,741,501 kr.); iron ore (231,840,366 kr.); wood and wood products (215,286,956 kr.); nonelectrical machinery (114,812,455 kr.). Chief articles of import were coal and coke (260,801,838 kr.); nonelectrical machinery (225,159,463 kr.); iron and steel (219,410,306 kr.); vehicles and parts (140,920,390 kr.); mineral oils (134,339,796 kr.); electrical machinery (93,068,552 kr.). Exports went chiefly to Great Britain, Germany, the United States and Norway. These countries, plus Belgium and the Netherlands, supplied most of Sweden's imports.

Certain statistics announced for 1941 indicated that Germany delivered to Sweden only 3,200,000 tons of coal out of a promised 4,000,000 (normal imports of coal are 8,000,000 to 9,000,000 tons), and 230,000 tons of merchant iron out of the promised 305,000. In Sept. Germany was 72,000,000 kr. short of balancing her trade with Sweden. Total Swedish-German trade turnover of 1941 was 1,755,000,000 kr. (as of Dec. 15). Up to Oct. 1941, 18 ships from overseas had arrived in Gothenburg; 20 had gone out, of which five were lost. From Jan. to Oct. 1941, Sweden exported 981,000,000 kr. of goods and imported 1,205,000,000 kr.

Communication.—On Dec. 31, 1940 there were 10,231 mi. of railroads. In 1939 there were 53,787 mi. of highways, practically all listed as "improved." Motor vehicles licensed (Dec. 1940) numbered 81,334. Airways (1939) flew 1,536,000 mi. and carried 60,000 passengers. Telephones (Dec. 31, 1940) numbered 908,653 (about 145 per 1,000 people), putting Sweden second only to the U.S. in the per-capita ratio of telephones. Telegraph mileage was 11,040. There were 1,470,375 licensed radio sets and 35 broadcasting stations.

Sweden's merchant marine earned 442,000,000 kr. in 1940, up 2,000,000 from 1939. Some shipping was permitted by agreements with Germany and Britain, and Sweden attempted to make herself as independent as possible by dredging channels and cutting a one-mile canal through the Falsterbo peninsula in southern Sweden.

Agriculture.—The harvest of 1941 was reported to be about 70% of normal. The principal agricultural products in 1939, with yields in short tons, were as follows: sugar beets, 2,094,370; potatoes, 2,059,096; oats, 1,416,456; wheat, 941,364; mixed grain, 656,971; barley, 275,575; rye, 416,669.

Manufacturing.—The total value of production in 1939 was 8,151,768,000 kr. There were 644,360 workers in 19,092 establishments. The chief manufactures were machinery and metal, 2,518,576,000 kr.; wood and paper, 1,489,655,000 kr.; foods, 1,395,787,000 kr.; clothing and textiles, 801,799,000 kr.; chemicals, 392,569,000 kr.; electrical equipment, 302,984,000 kr.; beverages, 230,845,000 kr.; stone, etc., 229,054,000 kr.; and leather, 228,717,000 kr.

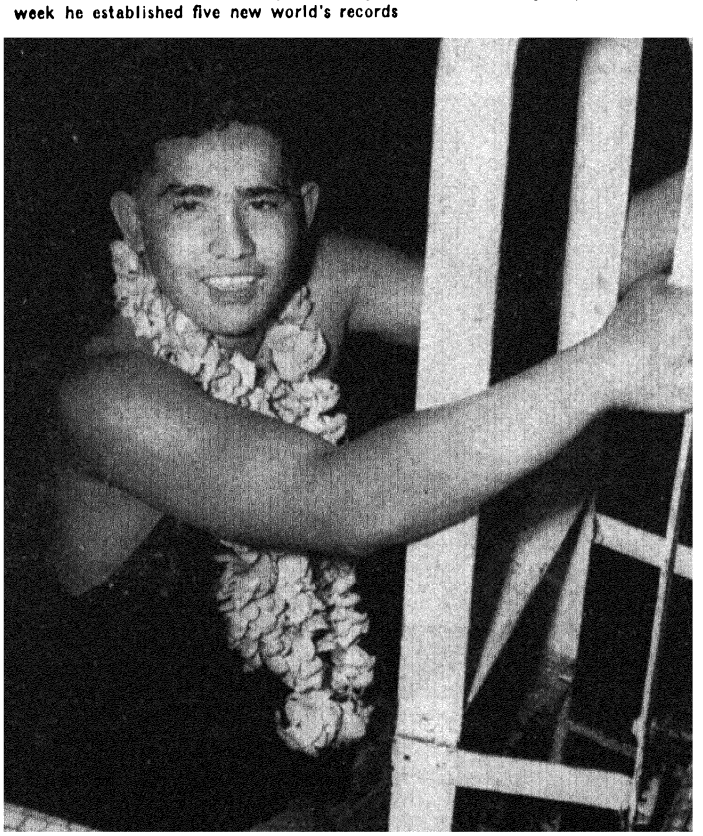
The relentless increase in prices was indicated by the wholesale price index (based on 100 for 1935), which rose from 115 in 1939 to a high of 175 in Sept. 1941.

Mineral Production.—Production of the leading minerals in 1939 was as follows: iron ore, 15,197,633 tons; iron and steel, 1,300,900 tons; cast iron, 709,923 tons; coal, 489,085 tons; arsenic ore, 267,065 tons; sulphur pyrites, 211,352 tons; fire clay, 153,168 tons. Silver production amounted to 7,226,855 oz.; gold, 2,149,220 oz. (F. D. S.)

Sweet Potatoes: *see* POTATOES.

Swimming. The spread of international hostilities hit competitive swimming hard in 1941. Although the warring nations encouraged activities, conducting the usual national championships for women, girls and boys, most of them were obliged to cancel the senior title tests for men and all customary inter-

BILLY SMITH, 16-year-old Hawaiian swimmer, after he had set a new world's record of 2:07.7 for the 220-yd. free style at Honolulu May 16, 1941. In one week he established five new world's records



country matches.

The year's highlight was the leap to fame of a virtually unknown 16-year-old Irish-Hawaiian schoolboy, William Smith, Jr., of Honolulu. The lad gained recognition as the greatest middle-distance swimmer ever developed by breaking free-style world's records from 220 yd. to 800 m. His top feat, 9 min. 50·9 sec. for 800 m., attained in a 100-m. bath, is equal, allowing for the gain at the turns, to about 9 min. 43 sec. for the distance in a 50-m. pool, the length of course over which was set the listed standard of 9 min. 55·8 sec. Smith cut the marks for 220 yd. to 2 min. 7·7 sec. and 400 yd. to 4 min. 38·5 sec.

Five other world's records were bettered by swimmers of the United States. Adolph Kiefer clipped the back-stroke figures for 100 yd. to 57·8 sec.; 150 yd. to 1 min. 30·4 sec.; 200 m. to 2 min. 23 sec., and 400 m. to 5 min. 10·9 sec. Teams representing Yale, Michigan and the Chicago Towers club shaded the 400-yd. relay record of 3 min. 30·7 sec., a Yale four taking final possession in 3 min. 27·7 sec.

Very little news emerged from Europe, but Artem Nakache of France was credited by cable with lowering the 200 m. breast-stroke world's record for men from 2 min. 37·2 sec. to 2 min. 36·8 sec. No official confirmation arrived.

Notable were the great strides made throughout Central and South America. The swimmers of El Salvador, in particular, improved so amazingly that they were able to break all national records for men and women by wide margins.

Five South American champions engaged in a competitive tour of the United States and garnered their good share of the laurels. Miss Maria Lenk, of Brazil, only woman member of the team, more than once beat North American breast-stroke records. Hawaiians scored their third and greatest triumph in the outdoor championships of the United States, winning eight of ten swimming events and running up a huge total of 71 points.

(L. DE B. H.)

Switzerland, a confederation of west-central Europe, bounded N. and E. by Germany, S. by Italy and W. by France. Area 15,944 sq.mi.; pop. (est. 1941) 4,200,000. Chief towns: Berne (cap. 121,976), Zürich (329,780), Basle (162,559), Geneva (123,286), Lausanne (89,632). Government: republican confederation of 22 cantons, joined together by the federal constitution of May 29, 1874, but with large powers of local control retained by each canton; central executive, a federal council of seven members; president (Jan. 1, 1942), Dr. Philippe Etter. Languages (census 1930): German 2,924,314; French 831,100; Italian 242,034; Romansch 44,204, and others 24,797. Religion (1930): Protestant 2,230,536; Roman Catholic 1,666,317; Jews 17,973.

History.—The party composition of the national council, or lower house of the federal legislature of 187 members, was as follows, according to the elections of Oct. 1939: government coalition: Radical Democrats 50; Catholic Conservatives 44; Farmers, Traders and Citizens 21; other parties: Liberal Democrats 6; Independents 9; Young Farmers and Free Democrats 6; Social Democrats 45; Dissident Socialists 4; no party 2.

With a sturdy citizen militia, good mountain defenses, and a firm neutral policy, Switzerland continued in 1941 to remain a haven of peace and security in the midst of a war-torn Europe. On Aug. 1, 1941, the whole country celebrated in traditional fashion the 650th anniversary of independence.

With the French collapse in June 1940, the Swiss position had become critical. The country was thenceforth ringed about by territory under nazi or fascist control. Its profitable tourist trade evaporated. It had to support thousands of refugees who poured across its frontiers from France, as well as some 60,000 French soldiers who sought protection under the Swiss flag and were interned for the duration. The German and Italian press complained loudly and threateningly that the Swiss newspapers were pro-British because they printed British war communiqués.

BELATED CHRISTMAS PACKAGES for British prisoners in Germany, stacked in a railroad station at Geneva, Switzerland in the spring of 1941. Switzerland acted as mediary for the daily delivery of more than 60,000 pieces of mail between the belligerents during the year

After the declarations of war by Japan, Germany and Italy against the United States in Dec. 1941, the Swiss government consented to take care of the interests of both groups of belligerents in addition to the burden already assumed of representing the interests of numerous other countries at war.

Economic Conditions.—After the German occupation of France in 1940, Switzerland was almost completely cut off from trade with overseas countries and was forced into greater economic dependence on Germany. By a commercial treaty signed July 19, 1941, Germany extended until the end of 1942 her clearing agreement with Switzerland and agreed to deliver monthly 13,500 tons of iron and 14,500 tons of petroleum, plus certain amounts of sugar, potatoes, alcohol and poultry feed; in return the Swiss were to supply cattle, fruits and milk products.

Rationing of seven food products was introduced soon after World War II began. Gradually the rationed items were extended and the allotments were cut down. The rations in Dec. 1941 included 14 oz. of cheese, three eggs, and 200 gr. of tea, coffee, cocoa or substitutes per person per month, and were estimated to provide a total of 2,311 calories, as compared with the average U.S. daily diet of about 3,000 calories. (S. B. F.)

Symphony Orchestras: *see* MUSIC.

Synthetic Products: *see* CHEMISTRY; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; RAYON; RUBBER AND RUBBER MANUFACTURE; STANDARDS, NATIONAL BUREAU OF; TEXTILE INDUSTRY; PETROLEUM.

Syphilis: *see* EPIDEMICS AND PUBLIC HEALTH CONTROL; MARRIAGE AND DIVORCE; MEDICINE; SELECTIVE SERVICE; VENEREAL DISEASES.

Syria and Lebanon. Independent republics, formerly French mandated territories, bordering the eastern Mediterranean south of Turkey. Area 77,700 sq.mi.; pop. 3,600,000; chief towns: Damascus (cap. of Syria, 225,000), Beirut (cap. of Lebanon, 180,000). Commander-in-chief in the Levant: General Catroux; president of Syria: Sheik Taj-ed-Dine-el-Hassani; of Lebanon: M. Naccache. Language: Arabic; religion, Mohammedan.

History.—At the beginning of 1941 the economic situation in Syria and Lebanon was rapidly deteriorating, owing to the British blockade and to the requisitioning by the German and Italian armistice commissions of all raw materials and food stocks. On March 12 insurrections took place all over Syria and Lebanon. Gen. Henri Dentz, who had been appointed high commissioner and commander-in-chief in the Levant by the Vichy government in Dec. 1940, tried at first to suppress the uprisings, and was forced to proclaim a state of siege in many Syrian cities (Mar. 25). Meanwhile negotiations with the nationalist leaders for the application of some kind of Franco-Syrian treaty were proceeding without great success.

In May the activities of German agents in the near east culminated in the Rashid Ali revolt in Iraq. It then became known that the Vichy authorities and Gen. Dentz, instead of practising strict neutrality, were allowing the use of Syrian aerodromes by German aircraft, and sending war materials to the Iraqi rebels. In view of this, the British and Free French took action to prevent the establishment of axis forces in Syria. Operations started on the morning of June 8, and proceeded with caution so as to avoid unnecessary bloodshed and destruction. They were terminated by the convention of Acre, signed July 12. (*See* WORLD WAR II.) The military occupation of Syria was then undertaken by the British and Free French forces. The civil administration was entrusted to Gen. Catroux, Free French delegate-general and plenipotentiary, and commander-in-chief of the Free French forces in the Levant. On the day the Allied troups entered Syrian territory, Gen. Catroux in the name of Gen. de Gaulle (*q.v.*) and Free France published a proclamation in Cairo addressed to the Syrian and Lebanese peoples in which he stated his intention "to put an end to the regime of the mandate and to declare those peoples free and independent." This declaration of independence and sovereignty was guaranteed by the British government and was preceded and followed by a statement that "Great Britain has no territorial ambition whatsoever in Syria and the British government recognizes the particular historical and other privileges of France in these territories," made by the prime minister and the foreign secretary of Great Britain. The necessary consent to put a legal end to the mandate regime was to be asked in due course of the League of Nations and the U.S.A., which have a special convention with France (1924) in regard to their privileges in Syria and Lebanon.

In August General de Gaulle paid an official visit to Syria and Lebanon. The independence of Syria was officially proclaimed by Gen. Catroux Sept. 27, and that of Lebanon Nov. 26. Both the president of the Syrian republic, Sheik Taj-ed-Dine-el-Hassani, and the president of the Lebanese republic, M. Naccache, promised equality of rights to every religious sect and individual liberty to members of all races and nationalities.

Finance.—Monetary unit, the Syrian pound (divided in 100 piastres). Revenue 1938 (at the rate of 20 francs=one Syrian pound) 588,787,596 francs. Expenditure 509,085,433 francs. Notes in circulation (June 30, 1939) £ Syrian 35,600,000; reserves (June 30, 1939), gold £ Syrian 3,500,000; foreign assets £ Syrian 31,800,000.

Trade and Communication.—Imports (1938) £ Syrian 64,500,000; exports (1938) £ Syrian 29,300,000. Roads (1939) *c.* 1,900 mi.; railways (1939) 890 mi.

Agriculture.—(1939) metric tons: wheat 607,000; barley 370,000; maize (1938) 27,500; oats 5,400; potatoes (1938) 41,600; tobacco 3,400; wine (1938) 43,000 hectolitres; cotton (1938) 8,400; cotton-seed (1938) 17,600; sesamum (1938) 5,300; olive oil (1938) 15,300; wool (1938) 9,900; raw silk 200. (*See* also FRENCH COLONIAL EMPIRE.)

Syrup, Sorgo and Cane.

Among the foods contributing to the national supply of sweets, with the United States experiencing a sugar shortage, were syrups or molasses made from sweet sorghum[1] and from sugar cane. In the early settler days of the middle west, sorghum or sorgo was often the only sweetening used, sugar not being available. Settlers called sorghum syrup "long sweetening," and sugar "short sweetening." Sorghum syrup is produced in 17 states and the production in 1941 was 11,681,000 gal. from 190,500 ac.; yield, 61·3 gal. per ac. Production in 1940 was 11,267,000 gal. Syrup produced from sugar cane in the United States in 1941 was 18,374,000 gal. from 113,000 ac., produced in eight southern states. Production in 1940 was abnormally low, 13,415,000 gal. (*See* also BEE-KEEPING; MAPLE PRODUCTS.) (S. O. R.)

[1]Sweet sorghum is also grown extensively in the United States for forage and hay, a crop of 15,040,000 tons having been produced from 8,582,000 ac. in 1941. Grain sorghums (non-saccharine) produced 153,968,000 bu. of grain from 8,903,000 ac. in 1941; grown chiefly in subhumid areas of the United States.

Table Tennis.

For the second successive year the war in 1941 caused cancellation of the International Table Tennis federation's world championship matches for teams and individuals. The influx of young stars into the armed forces, combined with the compact nature of the game, made table tennis one of the most popular forms of indoor recreation at military posts in all the nations at war. International competition being out of the question, national associations in Europe confined their activities largely to staging exhibitions for the Red Cross and similar organizations; in England more than £3,000 was raised through the exhibitions of two former world singles champions, Viki Barna and Richard Bergmann.

There were no changes in the playing rules except in the U.S.A., where a new ban on all types of finger-spin services was pronounced successful after a year's experiment and where the regulations against strictly defensive play were tightened. Louis Pagliaro and Sally Green retained their U.S. national singles titles, New York retained the national team title, and Culver-Stockton college won the Bradley intercollegiate trophy. (C. Z.)

Tagore, Sir Rabindranath

(1861–1941), Indian poet and author, was born May 6 in Calcutta, India. The famous Indian poet and philosopher, who won the Nobel prize for literature in 1913, took up painting at the age of 68 and exhibited his works in Moscow, Berlin, Munich, Paris and New York city.

He delivered the Hibbert lectures at Oxford, England, in 1930 and published his last work in English, *The Religion of Man*, in 1931. He died in Calcutta after a long illness, Aug. 7. (See *Encyclopædia Britannica.*)

Tahiti: *see* PACIFIC ISLANDS, FRENCH.

Taiwan: *see* FORMOSA.

Talc.

The production of talc and the related minerals, ground soapstone, pyrophyllite and pinite, reached a new record high in 1940, with sales totalling 281,375 short tons, an increase of 11% over previous record figure of 1939. Canadian production, usually of the order of 10,000–15,000 short tons annually, was reported by value only in 1940, at $229,640, a gain of 35% over 1939.

South Africa had a small output, 1,757 short tons of talc in 1940, but that of pyrophyllite approached 10,000 tons.

A new deposit of talc was opened in Newfoundland, and shipments were made to England, in the attempt to replace material formerly imported from Manchoukuo.

World production was of the order of 550,000–560,000 metric tons, of which the United States supplied about 46%, Manchoukuo 14%, France and Italy 10% each, Norway and India 5% each, with a number of smaller producers. (G. A. Ro.)

Tanganyika: *see* BRITISH EAST AFRICA; MANDATES.

Tanks, Military: *see* ARMIES OF THE WORLD; MUNITIONS OF WAR; WORLD WAR II.

Tariffs. War superimposed upon tariff systems other and more direct methods of controlling trade, notably licensing requirements and exchange controls. Direct controls became more numerous, more complicated, and more drastically applied.[1] Generally tariffs were left unaltered when direct controls were established, but in a few cases import duties were eliminated (*e.g.*, British duties on machinery) to avoid restricted supplies and higher domestic prices; or tariffs or fees were raised in order that the higher prices might contribute to the state revenues. The year 1941 did not bear out the professions of the Germans that they were establishing a multilateral clearing centre in Berlin for the trade of Europe. They, in fact, kept a tight rein on continental trade either by direct administration or by centring control in a bilateral arrangement with each single country, by controlling agreements of other countries with each other, and by not allowing the free transfer of credits in Berlin.

Except for certain Trade Agreements (*q.v.*) in the Americas, the history of tariffs was relatively unimportant in 1941. This was true despite a world-wide tendency toward greater flexibility in tariffs through progressive transfer of power of control from legislatures to executives. "In Aug. 1939—that is, before outbreak of the war—the executive branches of most European governments had almost unlimited authority to alter import duties."[2] In the British Dominions and in many Latin-American countries executive powers were less sweeping; and in Latin-America the war did not produce the sweeping changes that characterized the British Dominions.

The belligerents made relatively little use of the tariff as a means of controlling trade. The government of the United Kingdom, for example, in 1941, made or extended perhaps a dozen minor tariff changes; but they issued some scores of orders relating to import or to export licences and some 2,000 statutory rules and orders to regulate domestic production, distribution and prices. The free entry of certain fish was extended for a year, certain excises on medicinals were repealed, certain gifts were exempted from duty, and several chemicals, from key industry duty. Military equipment and supplies for American naval and air bases in British possessions in the western hemisphere were made exempt. While it was essentially only a matter of bookkeeping, there was an exemption from duty of a considerable list of products of which the imports were mainly for government account.

Throughout the world even among the non-belligerents, the stress of war's insatiable hunger shifted the emphasis of governmental policies from promotion of exports to promotion of imports. Turkey's change of slogan was significant. It was: "We buy from those who buy from us." It became: "We sell to those who sell to us." The change of emphasis, however, showed itself only in limited degree in reductions of import duty. There were, however, widespread increases of export duties and licence restrictions or embargoes on exports, to reserve supplies for the country of production. Barter and compensation agreements, such as those forced by axis neighbours on Sweden and Switzerland, favoured imports into countries which held the whip hand.

United States.—Throughout the world generally, 1941 saw the usual scattering increases of duties on revenue-producing imports as well as for protective purposes, and scattering reductions on raw materials or on necessities whose enhanced prices made importation burdensome. The government of the United States almost alone continued through 1941 a policy of general tariff reductions by making trade agreements with other countries. The twelfth trade agreement with a Latin-American country, that with Argentina, became effective Nov. 15, 1941. In this agreement Argentina reduced its tariff rates on 39 classifications of goods, covering about 18% of the United States exports to Argentina, although certain reductions were not to become effective until the customs revenue had further recovered. The United States granted reductions on imports representing in 1940 44·5% of total imports from Argentina, and larger percentages in earlier years. Argentina cut her rates generally by 30% to 50%; many of the rates were estimated to be equivalent to 50% to 100% ad valorem, with some on automobile parts ranging to higher levels. The United States halved or approximately halved import duties equivalent to from 60% to 120% ad valorem on canned or cured meats, oleostearine, some wools, casein and tallow. On two of the major items, quebracho extract and hides, rates of 15% and 10% were halved. The duty on flaxseed was cut.

The United States on Dec. 23 signed a second supplemental trade agreement with Cuba to become effective Jan. 5, 1942. It pledged further concessions on sugar and tobacco, bringing the reductions to one-half of the statutory rates. The Cuban reductions were chiefly on fruits, vegetables and a few other edibles, and generally meant new or further cuts by one-quarter to one-half.

Also on Dec. 23 President Roosevelt announced approval of the declaration of policy of the Joint War Production Committees of Canada and the United States, including the statement that "Legislative and administrative barriers, including tariffs, import duties, customs and other regulations or restrictions of any character which prohibit, prevent, delay or otherwise impede the free flow of necessary munitions and war supplies between the two countries should be suspended or otherwise eliminated for the duration of the war." This remained to be implemented.

The United States gave notice of trade negotiations with Chile, Uruguay, Iceland and Peru. It was known that informal discussions were begun with Mexico and certain British Dominions.

On the other hand, under the flexible tariff law, the United States raised the duty on crab meat from 15% to 22½% ad valorem (Sept. 21); and in connection with domestic price raising measures, limited imports of wheat and wheat flour to annual quotas of 800,000,000 bu. and 4,000,000 lbs. (May 29).

South America.—The ministers of finance of Brazil and Argentina signed an agreement on Oct. 6, 1940, expressing adherence in principle to the idea of complementary rather than competitive development of their countries. Following this a conference of representatives of Argentina, Brazil, Chile, Bolivia and Paraguay, Jan. 27 to Feb. 6, 1941, agreed on 9 conventions and 17 resolutions in the sense of encouraging trade between them. The conventions related to parcel post, tourist travel, free passport visas, transit trade, pipelines, etc. A Regional Office of Economic Studies was to be established. The difficulties of the landlocked states, Bolivia and Paraguay, were recognized especially in an undertaking not to claim under the most-favoured-nation clause any favours extended by any signatory power to these states and to no others.

A treaty of Jan. 23, 1940, between Argentina and Brazil containing lists of tariff reductions became definitively effective on Nov. 11, 1941.

On Nov. 21, 1941, Argentina and Brazil signed a treaty "with the object" according to the preamble, "of arriving at the progressive establishment of a system of free interchange which will enable the arrival at a customs union between the Argentine Republic and the United States of Brazil, open to limitrophe countries, which would constitute no obstacle to any broad program of economic reconstruction which, on the basis of the reduction or elimination of customs tariffs and other commercial preferences, tends to promote international trade on the multilateral and unconditional principle of the most-favoured-nation."

The two countries agreed to promote establishment of new industrial, agricultural and livestock activities not, up to then, in existence in either country, and they agreed to admit products of such industries free of duty for 10 years, and without other restrictions, and to protect them against dumping from outside sources. Articles produced in only one of the countries would not be met by protective duties in the other, but rather would receive special preferences, not to be extended to other suppliers.

Brazil and Chile agreed upon lists of tariff reductions, provisionally effective Dec. 15, 1941.

By the treaty of Oct. 15, 1941, Guatemala and El Salvador agreed upon a large measure of free trade between the two countries, and on Aug. 26, Haiti and Santo Domingo signed a treaty for mutual reduction of tariff rates. By a convention of Sept. 24, 1940, the United States abandoned its supervision of the Customs Administration of Santo Domingo, effective April 1, 1941. (*See* also TRADE AGREEMENTS.)

United Kingdom.—In the Dominions, as in all regions of the United Kingdom, direct war controls were vastly more important than changes in

[1] The District Bank, Limited, published a Digest of the United Kingdom Exchange Regulations, in 55 pages.

[2] U. S. Tariff Commission, Regulation of Imports by Executive Action, 1941.

tariff rates. However, the Canadian budget effective April 30, 1941 cut in half most of the duties on products of Britain, although woollens and footwear were reduced by only one-quarter, and no reduction was made on alcoholic beverages, tobacco, sugar and silk. This action was to be valid for the duration of the war. It was inspired by warring Britain's acute need of foreign exchange; and it was unusual in that in the past Canadian discriminations against United States trade were increased chiefly by raising rates on imports from outside of the empire rather than by lowering the rates for British products. In June and later many British products were exempted from dumping duty, *i.e.*, they were freed from penalty if the export values were declared without including the British taxes of 16⅔% or 33⅓%; and in December the whole anti-dumping law was suspended except in respect of fruits and vegetables. In November munitions and supplies of war were exempted from duty, and the lists of exports embargoed were enlarged and consolidated, and further enlarged effective Dec. 30, after the United States set up war embargoes. During the year Canada signed most-favoured-nation treaties with Paraguay, Chile and Ecuador. Ecuador removed from Canadian products the 50% surtax imposed under the trade-balancing policy.

In Australia the quota and licence systems were drawn closer, and the sales taxes (applicable also to imports) previously 5%, 10% or 15% ad valorem were made more commonly 10% or 20%. On imports the sales tax was levied on the duty-paid value, *i.e.*, it might amount to 40% of the price at which the foreign supplier sold the article.

South Africa increased rates on cigarettes, beer and gasoline; and granted rebates, generally of the whole duty, on numerous materials and findings of various industries. New Zealand, chiefly by licences and quotas, maintained as far as possible the policy of confining trade to the United Kingdom.

India raised specific rates on certain textiles, and reduced the duty on wheat to the nominal rate of two annas per cwt. (B. B. W.)

Tasmania. A state of the Australian commonwealth, forming an island 26,215 sq.mi. in area to the southeast of the mainland, from which it is separated by 140 mi. of Bass strait. Pop. (est. Dec. 1940) 243,057. Chief towns: Hobart (cap., 65,450); Launceston (33,250). The state governor in 1941 was Sir Ernest Clark.

History.—The Labour government, under the premiership of R. Cosgrove, continued in office during 1941. The state budget resulted in a deficit of £180,000 as compared with the estimate of £220,000.

Agricultural conditions were favourable, and the allotted quota of 15,000 acres of flax was planted during the season. There was an active demand for Tasmanian hardwoods both on the mainland and in New Zealand. The government planned a vigorous reafforestation policy in view of the big expansion of this industry which seemed likely to develop in the next few years.

Manufacturing industries worked to full capacity, and by the end of 1941 there was a pronounced shortage of skilled workers. In July the federal government announced that, in accordance with its plans to spread its munition factories throughout the commonwealth, a gun ammunition factory was to be erected in Tasmania at a cost of £500,000.

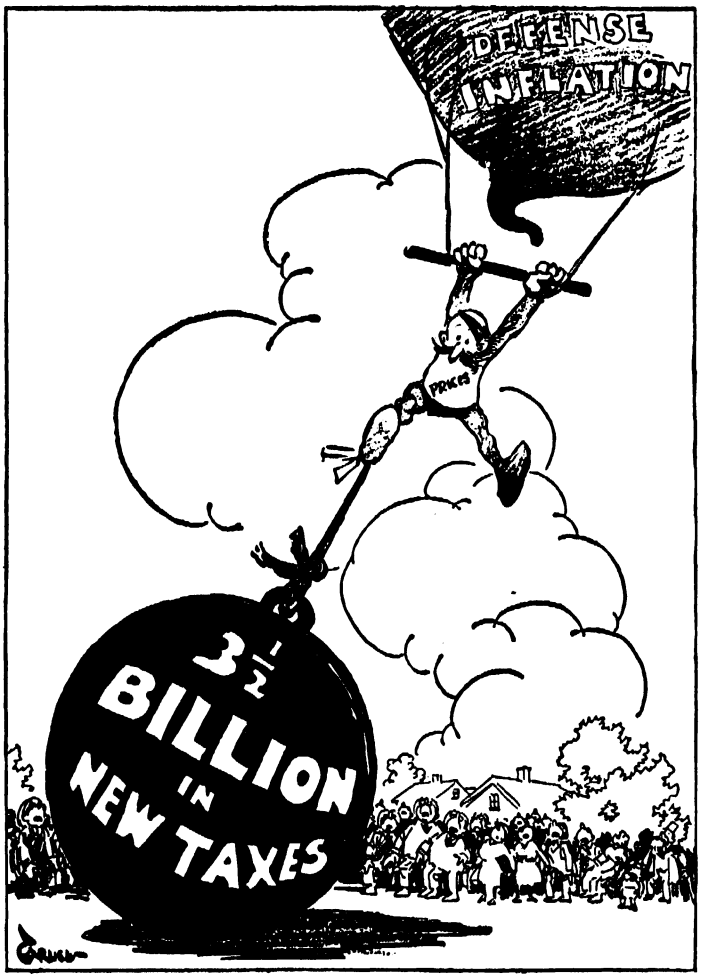
Finance.—Revenue (1940–41), £A2,920,000; expenditure £A3,110,000; public debt (June 30, 1941), £A218,162,000.

Communication.—Dec. 31, 1939: roads, 9,350 mi.; railways: government, 658 mi.; private, 132 mi. Motor vehicles licensed (March 31, 1941): cars 17,964; trucks 5,493; cycles 3,342. Wireless receiving set licences (March 31, 1941) 44,513. Telephones (June 30, 1939) 18,013.

Industries.—Production 1938–39: primary £A8,142,441; secondary £A5,398,659. Labour, 1939–40 average: factory employment, 13,970 employees; unemployment (March, 1941) 3.6%. (W. D. Ma.)

Tassin, Algernon de Vivier (1869–1941), U.S. author and educator, was born Dec. 11 in Fort Halleck, Nev. After receiving his M.A. from Harvard in 1893, he became an actor and playwright but deserted the stage in 1905 to lecture at Columbia university. He was named associate professor of English in 1931, retiring in 1941. He originated the course, "The Analysis of the Written Word," which stressed the value of oral reading of literary selections. Tassin was the author of *The Magazine in America* (1916); *The Craft of the Tortoise* (1919); *The Rainbow String* (1921) and *The Oral Study of Literature* (1923). He died in Montclair, N.J., Nov. 3.

Taxation. "Runaway taxation," as the result of growing fear of "runaway inflation," was the prospect faced by the people in the United States as the year 1941 drew to a close. Already a reality was the $3,500,000,000 Revenue act of 1941, the heaviest taxation measure ever passed by the congress of the United States. The additional revenue produced by this legislation was expected to bring total annual tax receipts of the federal government to between $12,000,000,000 and $15,000,000,000, depending upon the size of the national income. The rate of increase in national income, as governmental spending accelerated during the final quarter under the defense production program and the entry of the United States into the world-wide war, indicated a record-breaking total of approximately $95,000,000,000. It was estimated that the revised federal revenue code would produce about $15,000,000,000 a year were the national income to reach $100,000,000,000.



THE TAX BILL OF 1941 was effective in delaying "the balloon ascension," observed Carlisle of the *Des Moines Register*

But before the ink had dried on the president's signature (Sept. 20) to the Revenue act of 1941, it was apparent to close observers of fiscal affairs that even $15,000,000,000 a year in revenue would be wholly inadequate to finance even a reasonable proportion of the colossal undertakings of the United States government. Earlier in the year Secretary Morgenthau had announced the aim of the treasury department, in the interest of fiscal solvency, to raise by taxes at least two-thirds of the government's expenditures, thus limiting borrowing to one-third. However, the realization of this worthy ambition seemed hopeless as each succeeding month recorded vastly increased expenditures requiring borrowing at the rate of 50% or more of treasury outgo.

Demands of Secretary Morgenthau, certain members of congress and prominent individuals and organizations all over the country for immediate elimination of all unnecessary nondefense expenditures—estimated to save from $1,000,000,000 to $2,000,000,000—were met by feeble gestures from congress and the White House.

No worthwhile savings were made. Congress did, nevertheless, create in the Revenue act a joint congressional-administrative committee to investigate the federal budget and recommend possible savings, based upon a report of the director of the budget bureau.

The result of the committee hearings indicated possible curtailment of nondefense spending for the fiscal year beginning July 1, 1942, but no appreciable savings for 1941 or the early part of 1942. (C. A. Sr.)

Income Tax.—The income tax is the most important single source of tax revenue for the federal government. In the fiscal year 1941, federal income tax collections amounted to $3,462,038,000, or 47% of total federal internal revenue and customs. The individual income tax accounted for $1,417,655,000, and the corporation income and excess profits tax for $2,044,373,000.

Income taxes produced 12%. of estimated total state tax revenues (exclusive of unemployment compensation taxes) during the fiscal year 1941. Collections from this source were at an all-time high of $420,000,000 in 1941. This amount compared with $358,000,000 in 1940 and $233,000,000 in 1930.

Individual Income Tax.—The Revenue act of 1941, applicable to taxable years beginning after Dec. 31, 1940, made extensive changes in the federal income tax. Personal exemptions were lowered, surtax rates were substantially increased, a simplified return was provided for small taxpayers, and special provision was made with respect to reporting of income from noninterest-bearing securities sold at discount.

Personal exemptions were lowered from $2,000 to $1,500 in the case of married persons and heads of families and from $800 to $750 in the case of single persons. The 1941 act did not change the $400 credit for dependents but provided that a dependent counted to constitute an individual as head of a family cannot be counted again as a dependent for purposes of the $400 credit. Formerly, an unmarried person (or a married person not living with husband or wife) maintaining a home for a person who also qualified as a dependent received in addition to the personal exemption as head of a family a credit of $400 for such dependent.

Surtax rates under the 1941 act ranged from 6% on the first $2,000 of surtax net income to 77% on the portion of surtax net income in excess of $5,000,000. These rates included the 10% defense tax which was formerly imposed separately. The surtax rates applied to the entire surtax net income; formerly, the first $4,000 of surtax net income was exempt from surtax. The normal tax rate of 4% was not changed.

In order to simplify the preparation of returns and the determination of tax for the small taxpayer, a simplified tax return, the use of which was optional, was provided for individuals with gross incomes of $3,000 or less derived solely from salaries, wages, compensation for personal services, dividends, interest, rent, annuities and royalties. A schedule on the return indicated the amount of tax to be paid at various levels of gross income by persons of different marital status. To determine the amount of his tax, an individual merely ascertained the amount of his gross income, subtracted $400 for each dependent for whom a credit was allowable and referred to the schedule to find the amount of his tax. The taxes shown in the schedule were computed to recognize personal exemptions and average deductions (interest paid, taxes paid, etc.) not allowable if the schedule was used. Nonresident alien individuals, estates or trusts were not allowed to use the simplified method.

The tax on nonresident alien individuals not engaged in business or having an office in the United States was increased generally from 16½% to 27½%. Under prior law, these rates as applied to residents of a contiguous country could be reduced to not less than 5% by treaty. The 1941 Revenue act authorized this reduction by treaty in the case of residents of any country in North, Central or South America, the West Indies or Newfoundland.

With respect to income from noninterest-bearing securities issued at a discount (of which the notable example was U.S. defense savings bonds), the 1941 Revenue act extended to taxpayers on the cash basis the privilege of electing to report as income the increase in the redemption price as it accrues. Under prior law, a taxpayer on the accrual basis reported the increment on such securities as it accrued, whereas a taxpayer on the cash basis was required to treat the entire increment in value as being income in the year of redemption or maturity.

Federal income tax data for 1939, compiled from income tax returns filed in 1940, showed that in that year there were 7,715,660 individual and taxable fiduciary returns of which more than half were taxable. Net income in excess of $15,000,000,000 was reported on taxable returns and total tax liability was $928,700,000. Preliminary statistics for 1940, which reflected the lowered exemptions of the Revenue act of 1940, indicated that the total number of returns increased to 15,246,000, of which 7,520,000 were taxable. Returns for 1941 which would reflect the further lowering of exemptions under the Revenue act of 1941 were expected to reach 22,007,000, of which it was estimated 13,200,000 would be taxable.

Individual income was in 1941 taxed in 31 states and the District of Columbia. In all but three of these, the rates were progressive, the minimum rates ranging from 1% to 3% and the maximum rates from 3% to 15%.

Four additional states taxed income from intangibles at flat rates. Five states in the above two groups imposed surtaxes, two of which applied only to income from intangibles and one to income from speculative transactions. With one exception, surtaxes were imposed at flat rates.

In no instance, however, did the maximum state income tax rate, including both normal and surtax, exceed 15%. Moreover, 22 states permitted the deduction of federal income taxes from gross income in computing net income for individual income tax purposes. The provision which permitted this deduction was adopted in Idaho in 1941. In the same year, Wisconsin, which formerly allowed the total amount of federal income taxes to be deducted, limited the deduction to 3% of net income. As a result of the lowering of personal exemptions under the federal income tax by the 1941 Revenue act, the federal tax in 1941 reached lower income groups than those reached by state income taxes. The personal exemptions allowed under state income taxes were at a higher level in 28 states for single persons and in 26 states for married persons. Credit for dependents was the same as the federal in 13 states, lower in 17 states and higher in 2 states.

Although some states preceded the federal government in employing the income tax, more than half the states imposing it in 1941 adopted it in 1929 or thereafter. After 1937, no additions were made to the list of states which tax income. Constitutional amendments authorizing the imposition of graduated personal net income taxes were proposed by the Pennsylvania and Washington legislatures in 1941 and were to be submitted to the electorate for approval. Philadelphia's tax on earned income of individuals and unincorporated business represented the only locally imposed income tax in the United States.

The states made numerous revisions in individual income taxes during 1941. Maryland lowered its rates, and South Dakota both lowered the rates and increased the exemptions. West Virginia increased the rates on incomes of $4,000 and over. New York's emergency 1% tax was permitted to lapse, but Massachusetts and Wisconsin extended their temporary surtaxes. Massachusetts also enacted an additional 3% surtax, the proceeds of which are to be used for old-age assistance.

California added a new section to the individual income tax which affords relief to persons receiving lump-sum payment for personal services rendered over a period of five calendar years or more by providing that the tax shall not exceed the amount due had such income been received in equal proportions in each of the years included in the period. This provision was similar to one adopted in 1939 in connection with the federal individual income tax.

Corporation Income and Excess Profits Tax.—The Revenue act of 1941 made no important changes in normal tax rates on corporations. The 10% defense income tax was integrated with the basic rate, and the resulting rates were rounded to the nearest per cent. A surtax of 6% on the first $25,000 of surtax net income and 7% on the balance was imposed.

The normal tax rate applicable to corporations with normal tax net incomes of more than $25,000 or less were taxed at lower graduated rates, ranging from 15% to 19%. In the case of corporations with incomes of slightly more than $25,000, the law provided for an alternative tax which was designed to accomplish a gradual transition between the tax on corporations with net incomes of $25,000 and less and the tax on those with net incomes in excess of that amount.

The rate of tax on nonresident foreign corporations, not engaged in business within the United States and not having an office or place of business therein, was increased from 16½% to 27½% on dividends, interest and other fixed or determinable annual or periodical income from sources within the United States. The rate of withholding at source was increased accordingly. In the case of nonresident corporations organized under the laws of any country in North, Central or South America, or in the West Indies or Newfoundland, these rates might be reduced by treaty.

Corporations were subject to an excess profits tax which was enacted in 1940 and made applicable to taxable years beginning after Dec. 31, 1939. This tax was retroactively amended by the Excess Profits Tax amendments of 1941 and was again amended by the Revenue act of 1941. The changes made by the Excess Profits Tax amendments of 1941 were in the nature of relief provisions which were concerned with: (1) the carry-over of unused excess profits credit to succeeding years; (2) the restoration to base period income of abnormal deductions; (3) relief for corporations that experienced rapid growth during the base period; (4) relief in cases of abnormal conditions during the base period; and (5) the use of predecessor's earning experience by corporations resulting from tax-free exchanges or reorganizations.

The chief changes in the excess profits tax by the Revenue act of 1941 were: increases in rates, reduction in invested capital credit, reversal of the deduction for income and excess profits taxes and more liberal allowances for new capital.

The excess profits tax rates were increased by 10 percentage points in each bracket and ranged from 35% on the first $20,000 of adjusted excess profits net income to 60% on all adjusted excess profits net income in excess of $500,000.

Corporations were permitted an excess profits credit which might be computed under the income plan or under the invested capital plan. Under the former, the credit was 95% of average excess profits net income for the base period 1936–1939. Prior to the 1941 changes, the invested capital credit was 8% of invested capital (equity invested capital plus 50% of borrowed capital). Under the new law, the credit was 8% on the first $5,000,000 of invested capital and 7% on the remainder. In order to provide more liberal credit where new capital had been added, the definition of equity invested capital was amended in 1941 to allow new capital to be counted at 125% of its value.

Under the prior law, the income tax was allowed as a deduction in the computation of the excess profits tax. In order that excess profits net income might not be reduced by that part of the income tax which was computed on income not subject to the excess profits tax, the deduction was reversed. As a result, the excess profits tax might be deducted in computing normal tax and surtax, but the normal tax and surtax could not be deducted in computing the excess profits tax.

General corporation income taxes were also levied by 32 states and the District of Columbia. One additional state restricted its corporate tax to income from intangibles. Seven states imposed graduated rates, the minimum rates ranging from 1% to 3% and the maximum rates from 5% to 8%. The other 26 states and the District of Columbia imposed flat rates, ranging from 1½% to 8%. Rates of 2%, 4% or 6% were most frequent.

During 1941, corporate tax rates were reduced by South Dakota. Arkansas changed from a flat rate of 2% to a rate graduated from 1% on the first $3,000 of net income to 5% on all income in excess of $25,000. Massachusetts and New York extended the temporary additional taxes on corporations, and Massachusetts enacted an additional surtax of 3% for purposes of financing old-age assistance.

The deduction of federal income taxes from gross income in computing net income for state corporate income tax purposes was permitted in 19 states prior to 1941. During 1941, Idaho was added to the list of states permitting this deduction, and Wisconsin revised its provision to limit the deduction to 10% of net income.

Preliminary federal income tax statistics for 1939 showed that 515,960 corporations filed income tax returns for that year, of which 199,479 reported net incomes and 270,138 reported deficits. The remaining 46,343 corporations were inactive during 1939. The aggregate net income of the corporations reporting net incomes was $8,826,713,029; the total deficits of the corporations with no net income were $2,092,147,535. Returns with net income indicated a total tax liability of $1,232,256,254, including $1,216,450,292 income tax and $15,805,962 declared value excess profits tax.

(R. BL.)

"Nuisance" Taxes.—Under the revised law, corporations and the consuming public will pay close to $1,000,000,000 a year in new and increased excise or "nuisance" taxes. These include higher taxes or new taxes on billiard and pool tables, pin-ball machines, bowling alleys, playing cards, sporting goods, distilled spirits, brandy, wines, automobiles and trucks, tires and tubes, admissions, cabarets, club initiations and dues, radios, fancy matches, safety deposit boxes, cosmetics, perfumes, long distance telephone calls, telegraph, cable or radio messages, monthly telephone bills, wire and equipment service, electric light bulbs, luggage, gas and oil appliances, photographic apparatus, electric signs, various rubber articles, commercial washing machines, optical equipment, furs, jewellery, transportation of persons by rail, air or water, and sundry other things. The excise taxes became effective October 1 in most instances. A new kind of tax, a "use tax," is imposed on automobiles and motor boats. The owner of an automobile is assessed $5 a year for its use, and a graduated tax is levied on owners of motor boats. The new excise tax schedule is expected to add $1,000,000,000 a year to the revenue derived from so-called "hidden taxes."

Estate and Gift Taxes.—Estate and gift taxes were increased. Estate taxes continued to allow a $40,000 credit and then start the imposts at a rate of 3% on the first $5,000 of taxable estate. Then they rise sharply until a tax of 77% is reached for amounts above $10,000,000. Gift taxes start, after the same $40,000 exemption, at 2¼% on the first $5,000 of net and climb to 57¾% after passing the $10,000,000 amount.

Corporation Taxes.—Corporation taxes were sharply increased also. A new surtax on corporate earnings was imposed, starting at 6% on earnings of $25,000 or less and moving up to 7% on all above that figure. Increase in excess profits taxes by 10 percentage points in each bracket was provided. Corporations with net earnings of more than $25,000 a year will continue to pay 24% normal tax also. Those with smaller earnings will pay 15% on the first $5,000 net income, 17% on the next $15,000 and 19% on the next $5,000. Under the 1940 revenue act, the regular income tax was treated as a deduction in figuring the excess profits tax. This deduction was eliminated in the Revenue act of 1941. In fact the process is reversed, so that the excess profits tax is allowed as a deduction in figuring the income tax. Retained in the new law was the alternative choice to the corporation of computing excess profits upon either a basis of percentage return on invested capital or average earnings for the years 1936–39. The capital stock tax was boosted from $1.10 to $1.25 per $1,000 of declared value.

The treasury department fought unsuccessfully to knock out the "average earnings" method of calculating excess profits. Had its recommendations been accepted by congress, all corporations would have been compelled to use the invested capital formula in figuring excess profits. Although the administration failed in this plan, which would have borne down heavily on companies with conservative capital structures, it did achieve a partial victory by getting the average earnings formula reversed.

New Taxes.—Faced with the gigantic task of financing the war effort not only of the United States but also of a host of Allies, the U.S. treasury urged congress to expedite the passage of a second revenue act in 1941 and proposed radical new tax devices. But congress refused to consider additional tax legislation during its 1941 session. However, the house ways and means committee prepared to start work immediately after convening of the second session of the 77th congress on a tax bill to raise between $5,000,000,000 and $8,000,000,000 in additional taxes. Among the new types of taxes to be considered are a withholding tax up to 15% on wages and salaries (similar to the social security tax method), confiscation of all corporate earnings above a flat percentage of net profits and a manufacturers' sales tax. In addition to raising revenue to meet vastly expanding expenditures, one of the objectives of the government is to divert to the treasury a large part of the individual spending power that results from the defense program, and thus to help check inflation.

State and Local Government Taxes—Accredited estimates of state and local government taxes for 1941 placed the total at approximately $9,000,000,000, an increase of almost $500,000,000 over the previous record year of 1940, when $8,538,000,000 was collected. The state and local per capita tax for 1941 approximated $70. State tax revenue was derived principally from levies on property, incomes, estates, sales, pay rolls (for unemployment compensation), licences and other special business assessments. Ten states retained some form of poll tax. Of major importance to local governments were real estate and personal property assessments. Excessive taxation of residential realty and overvaluation of this type of property for tax purposes in many cities have served to arouse citizens to organized protest.

Extravagant spending by state and local governments, pursuant to the fiscal policy of the federal government, resulted in the most formidable array of protest organizations in the history of the United States. Some 1,200 taxpayers associations, backed by other thousands of civic and business groups, were raising their voices in opposition to loose spending, the needless creation of indebtedness and various degrees of political graft in state, county and municipal official affairs. Impetus was given to the organization movement in 1940 and 1941 by the stiff federal taxes imposed to help finance the national defense efforts and to speed up production of armament for the nations resisting axis aggression. While no accurate census was available, it may be assumed that the various taxpayers and citizens groups working together for economy in government represented several million citizens.

National Tax Organizations.—The scores of taxpayers organizations in every state in the union represent the practice of democracy in its truest form. These organizations keep before elected officials the fact that they are public servants, and at the same time they serve to impress upon citizens generally their own potentialities in relation to government. Of course, not all so-called taxpayers organizations are worthy of support, as this field has been invaded by racketeers at times. But with better interrelations between the various state and national groups, the racketeer is more readily discovered and exposed.

Although there has been in the past no central clearing house through which the achievements of the hundreds of taxpayers organizations can be accurately appraised, nevertheless there are definite records of what is being done in the various states to justify the assertion that hundreds of millions of dollars have been saved. There are also definite steps being taken toward a national cohesion of effort. The record shows that these economies have been accomplished through direct action in referendum on bond issues, appearance before official political bodies, court action and constant vigilance. The magnitude of the job confronting taxpayers engaged in procuring better government at economical and efficient levels may be seen when it is realized that there were in 1941 more than 175,000 political units—states, counties, municipalities, townships, school and road districts, park, water-supply, drainage, irrigation boards, etc.—having the power to spend public funds. Many also have the power to issue bonds and levy taxes. This topsy-turvy system imposes on the taxpayer, for state and local taxes alone, a burden of approximately $14,000,000,000 annually. (*See* also SUPREME COURT OF THE UNITED STATES.)

Great Britain.—Although the British tax rates on corporate income are stiffer than those of the United States, local and miscellaneous federal taxes in England are considerably lower. In Great Britain the corporate rates provided for in the 1941–42 budget are 100% on profits in excess of "standard earnings" (representing average earnings in one of three base periods plus 6% on common stock), but with 20% of the excess profits tax credited for return after the war. On the remaining net income the basic rate is 50%. In the United Kingdom nearly one-half the tax receipts are from levies upon income and profits, whereas in the United States comparable taxes produce only about one-third of total collections. In England the national government is the principal taxing agent, imposing about 90% of the total, while in the U.S. the federal government, even with recently broadened taxes, imposes only about 60% of all taxes. Estimating that federal, state and local taxes in the United States during the 1941–42 fiscal year would approximate $22,500,000,000, the per capita tax burden was $168. The total volume of taxes imposed by the British government in April 1941, together with "local" taxes, was expected to yield close to £46 or $184 (converted at $4 to the pound) per capita for the United Kingdom (England, Wales, Scotland and North Ireland). An unmarried individual with an income of £150,000 is required to pay £142,924 in income and surtax, or an effective rate of 19*s.* ½*d.* in the pound. On lower incomes a single person earning £500 a year is taxed £156 2*s.* 6*d.* or 6*s.* 3*d.* in the pound, whereof £26 13*s.* 4*d.* is reserved as a postwar credit; a £1,000 income pays a tax of £381 2*s.* 6*d.* or 7*s.* 7½*d.* in the pound, of which £43 6*s.* 8*d.* is reserved as postwar credit. Taxation had been extended downward to incomes as low as £120, on which tax of £7 10*s.* is payable annually. The postwar credit system applies only to incomes up to £1,500. Above that amount, the effective rate rises rapidly, an income of £10,000, for example, paying £6,862 7*s.* 6*d.*, or 13*s.* 8¼*d.* in the pound.

Canada.—In 1941 about five times as many Canadians as in 1939–40 had to pay income taxes, and the rates were all higher. The national defense tax is paid by almost everyone receiving income, salary or wages. Canada's war profits tax provides a flat levy of 75% on all net income above an "average earnings" base, and a normal tax of 18% on the remainder, or, as an alternative, a straight 40% tax for a company having little or no excess profits. The Canadian law permits (which the U.S. does not) the filing of consolidated returns for normal as well as excess profits, by which the loss of one subsidiary may be offset against the profit of another, upon payment of 2% higher normal tax.

Australia.—A change in governments late in 1941 brought about a change in the budget, the main difference being the dropping of the compulsory loan plan of former Prime Minister Fadden. Greater reliance was placed by the Curtin Labour government on increased taxation of high incomes, heavier company taxation and indirect imposts. To help cover the gap between war outgoings and taxes at existing rates, the last government proposed to raise £25,000,000 in obligatory loans, and a further £7,000,000 in additional taxes. That would have left £122,000,000 to obtain by loans from the public and the banks. In the new budget, £22,000,000 was to be raised by extra taxation, and the amount unprovided for was raised to £138,000,000. The Labour government relies upon voluntary offerings to achieve what the Fadden government proposed to do to a great extent by compulsion. Since the middle incomes were hit hard by the previous budget, no new taxation was proposed on incomes up to £1,500 a year. Ordinary tax on companies is increased from 2*s.* to 3*s.* in the pound, and the wartime company tax is so increased in grades, on profits above 8% of capital, to reach a 60% rate of tax on the portion of profits above 2[illegible]% of capital. Here again, a main purpose is to deter nonessential expansion. On private incomes, rates of 16*s.* 8*d.* in the pound apply after £2,500; those above £1,500 already pay 10*s.* in the pound on the excess.

Germany.—Tax receipts of the reich for the fiscal year 1941–42 would approximate 13,000,000,000 marks, which is 42% of expenditures totalling 74,000,000,000 marks. In line with the general policy of the National Socialist regime, the shifting of the tax burden from the shoulders of individually owned business to industrial and commercial corporations proceeded in 1941. Under a new decree, a liberal tax remission plan was made applicable to individually owned companies, while business corporations were penalized by an increase of 25% of the existing tax on incomes. These taxes in 1941 were 37½% of net profits for corporations with annual income of less than 100,000 marks and 55% for corporations earning more than that amount. (*See* also BUSINESS REVIEW: *Legislation Affecting Business;* INITIATIVE AND REFERENDUM.)

(C. A. SR.)

Taylor, Henry Osborn (1856–1941), U.S. historian and philosopher, was born Dec. 5 in New York city. He graduated from Harvard college in 1878 and from the Columbia law school in 1881. After publishing a treatise

on private corporation law in 1884, which ran into five editions, he abandoned law as a career and devoted his life to the study of ancient literature and philosophy. A painstaking and thorough scholar, he spent ten years in gathering material for his first work in this field, *Ancient Ideals, A Study of Intellectual and Spiritual Growth from Early Times to the Establishment of Christianity,* 2 vols. (1896). He spent four years completing *The Classical Heritage of the Middle Ages* (1901), and another ten years on the writing of his chief work, *The Medieval Mind,* the fifth edition of which appeared in 1938. He wrote a number of other historical works. In Nov. 1940 he was elected to the American Academy of Arts and Letters. He died in New York city, April 13.

Tea. Except for green tea, which comes chiefly from Japanese-dominated areas, there was little cause for concern in 1941 over the United States' immediate tea supply. Approximately 80% of the tea consumed in the United States is black tea produced in India, Ceylon, Java and Sumatra. Authority for the foregoing assertions was Benjamin Wood, managing director of the American Tea bureau, as quoted by the *Tea and Coffee Trade Journal,* New York city. Imports of tea into the United States in the first 11 months of 1941 were 99,165,092 lb. In the same period of 1940 United States imports of tea were 90,618,179 lb. These increased receipts, however, the *Tea and Coffee Trade Journal* pointed out, included large shipments of tea re-exported to Canada, which was said to have a six months' supply at the beginning of 1941. The U.S. army bought between 1,750,000 lb. and 2,000,000 lb. of tea in 1941. In Dec. 1941 the British government arranged to buy from the Netherlands Indies 48,000,000 lb. of tea in 1942, the same quantity the British bought from the Netherlands East Indies in 1941. Both the United States and Britain recognized tea as one of the necessary foods and therefore granted it shipping priority. The British armed forces in 1941 employed 1,500 mobile tea kitchens, according to the American Tea bureau, to serve tea to soldiers in Britain and on the war fronts. About 1,000 tea kitchens were operated by the Y.M.C.A., the remainder by the Salvation Army, the Woman's Volunteer service and the government. (S. O. R.)

Telegraphy. The unsettled state of world affairs during the year 1941 interfered considerably with international communication by telegraph and with the orderly progress and development of the art of telegraphy. Nevertheless certain improvements made in the direction of increased speed, accuracy and economy considerably advanced those aims.

Maximum Usage of Trunk Lines continued to be a major subject of attention and was constantly being furthered by means of such devices as carrier systems, the varioplex, reperforator switching, improved repeaters, subcentre switching, the extended use of direct circuits, etc.

Vacuum-Tube Repeaters, which for some years have been used extensively in telephone circuits but have not heretofore been particularly successful in telegraph circuits, have been improved and were in 1941 used in such circuits for relatively long periods of time without attention. They may be installed at offices which lack the staff required to operate and maintain the electromechanical type of telegraph repeater.

Reperforator Switching was further improved and additional offices equipped with this apparatus which eliminated manual relays of telegraph business and thus assured greater speed, accuracy and economy. Users of leased wire systems were also making extensive use of reperforator switching.

Facsimile Telegraphy showed continued improvement through intensive laboratory work and experience and was coming more and more into use. An improved type of cut-blank recorder was developed on which received messages were recorded upon blanks fed from a continuous roll of printed paper and were cut off at the end of each message. Another type of recorder was arranged to repeat, automatically, a message of which a number of copies were desired. A compact type of transmitter for use in patron's offices was well on the way to be released for general usage. A development of the facsimile telegraph, known as Multifax, a business machine for the automatic preparation of stencils, offset plates, hectograph carbons, etc., was improved, so that it was possible in 1941 by this means automatically to prepare clear master copies, either locally or at a distance, in considerably less time than by other methods and to be assured of absolute accuracy. In some forms of facsimile apparatus the speed of transmission and recording was greatly increased.

Coded Telegraphy has long been resorted to by governments and by individuals who for any reason wish to preserve secrecy in their communications. A new development, Telekrypton, greatly facilitated the ease and accuracy with which telegrams might be coded and decoded by properly authorized and equipped persons and at the same time increased the difficulty of decoding by unauthorized persons.

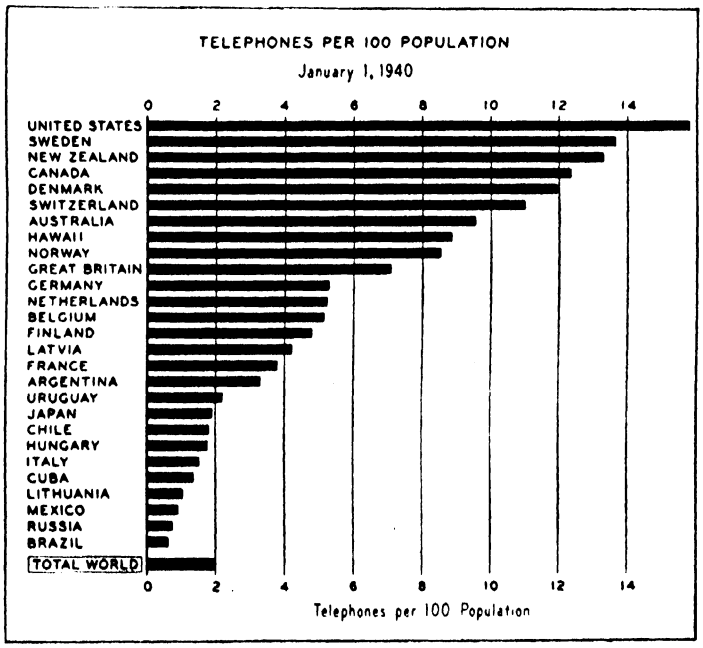
Statistics.—Reliable statistics covering the telegraph systems of the world were not available in 1941 but the latest data for the United States showed approximately the following land lines plant (aside from that controlled by telephone companies) devoted to the public service:

Miles of pole line	246,337
Miles of underground conduit (single duct)	6,133
Miles of aerial wire	1,832,535
Miles of aerial cable wire	110,476
Miles of underground cable wire	329,411
Miles of land line submarine cable wire	6,315
Total miles of wire (approximately 75% copper)	2,284,747
Number of public telegraph offices	23,400
Approximate investment in operating land lines plant	$370,000,000

The submarine cable telegraph system of the world consisted of about 360,000 mi. of cable, containing about 432,000 mi. of copper conductor and representing a capital outlay of about $400,000,000. Approximately 80% of the total mileage of submarine cable was provided by private enterprise and the remainder by government administrations. (A. N. Ws.)

Teleki, Pál, Count (1879–1941), Hungarian statesman and geographer, was born Nov. 1 in Budapest. Count Teleki's interests were varied. He was an authority on geography, chief boy scout of Hungary after 1929, and an able politician and statesman. His political career started in 1905 when he was elected to parliament. He was appointed prime minister and minister of foreign affairs in 1926, and in 1939 he was again named prime minister, retaining that post until his death. While Teleki was not averse to using Germany's might in winning back the lost province of Transylvania from Rumania, he nevertheless feared that a too great dependence on Hitler would jeopardize Hungary's independence. This misgiving was seen in the disclosure after his death that Count Teleki was one of the Hungarians who backed the book *Why Germany Cannot Win the War,* which broke all sales records in his country. But the German stranglehold on Rumania and Bulgaria in early 1941 placed Hungary in a precarious position. Worried by the grave turn of events and by the impending invasion of Yugoslavia, the 61-year-old statesman took his life on April 3 in Budapest. (See *Encyclopædia Britannica.*)

Telephone. The demand for telephone service in the United States in 1941 was greater than in any preceding year. By the end of the year it was estimated that there would be about 23,500,000 telephones in service in the United States, an estimated gain for the year of about 1,550,000. This was more than a 40% increase over the 1940 gain. The estimated

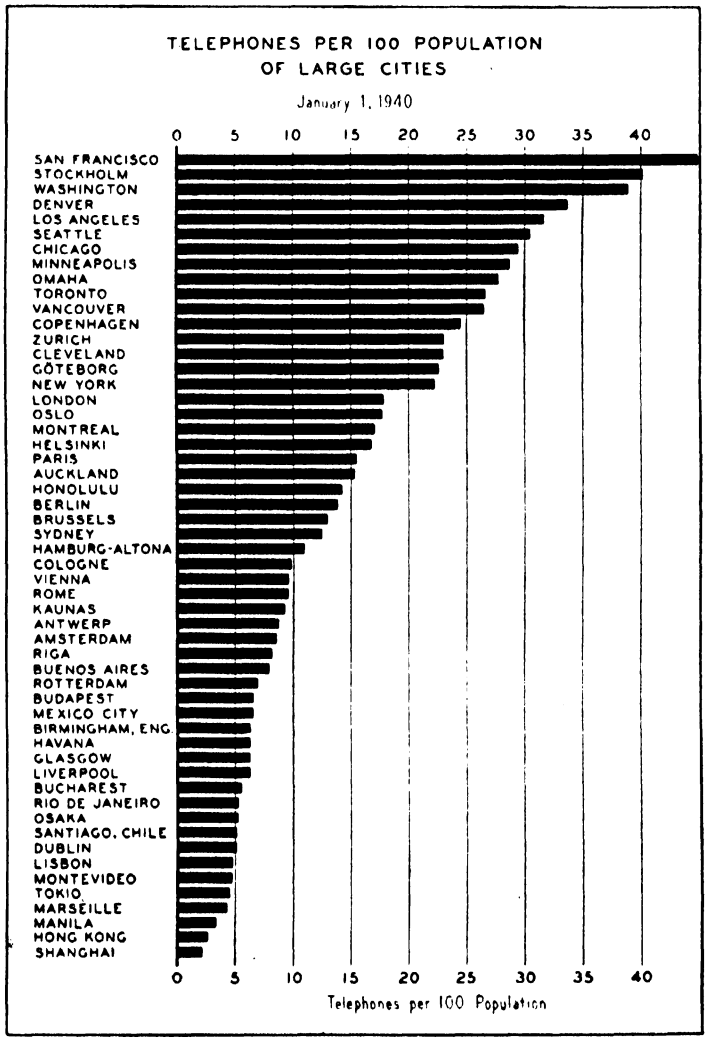


average number of daily telephone conversations grew to 105,000,000, some 7,000,000 above the corresponding 1940 figure. Completed toll calls in 1941 totalled more than 1,000,000,000, approximately 15% more than in 1940. The number of longer haul calls was about 28% greater than in 1940. The increase in toll calls was greatest in those parts of the country where defense activity was most intense. A sharp, but by no means the sharpest, relative increase occurred at Washington, D.C., where long-distance traffic during 1941 was nearly 60% greater than in the preceding year. In the week following the Japanese attack on Hawaii, Washington toll traffic was 110% more than the year before, and toll traffic generally throughout the country at that time was the heaviest in history.

Saving of Essential Materials.—To meet the unprecedented demand for telephone service suggested by these figures, expenditures for new plant construction were estimated at $450,000,000 for the year. This vast expansion, carried out in the face of growing shortages of a number of materials, called for the use of substitute materials wherever they could be used effectively and for the conservation of existing facilities and materials to the fullest extent.

Studies of basic materials and their applications in the telephone field have been actively carried forward by telephone research workers for many years. The experience gained in these studies facilitated changes in design and manufacture which permitted large quantities of scarce materials to be saved for the production of armaments. For example, the annual consumption of aluminum in the Bell System based on production rates and substitutions in effect on Nov. 1, 1941, was reduced approximately 1,900,000 lb., by using other materials where aluminum would normally have been employed. On the same basis the saving of zinc was at the rate of about 5,200,000 lb. and of nickel about 300,000 lb. a year.

In addition to the substitution program the telephone companies from the beginning of 1941 undertook to cut their over-all needs for materials by deferring certain projects that were to have been undertaken in order to improve service. For example, replacements of old manual central offices by dial equipment were reduced from the original program. Used materials were extensively repaired and re-used, and numerous other measures of a corresponding nature were voluntarily introduced. These voluntary restrictions reduced substantially the needs of the telephone industry for scarce materials. By autumn, however, as the supply problem became more difficult, the telephone companies adopted a number of special engineering and operating practices directed toward meeting the essential service needs of the present and immediate future with the least possible current consumption of materials. Replacements of old manual central offices by dial equipment were practically eliminated. The number of pairs in exchange cables being placed were cut in some cases to only one-fourth of the number that would be normally used. Additions to dial offices were limited to the estimated requirements for one year. Moreover, the repair and re-use of materials were still further extended. These emergency procedures involved some sacrifice in the quality of service, and since they did not allow for any margins beyond the foreseeable needs of the immediate future, the industry's ability to meet sudden increases in demand for service was, of course, affected.



Some 1941 Achievements.—Even without the problems presented by the material shortage, the 1941 telephone job was difficult and unusual in many respects and its accomplishment was a source of satisfaction, particularly because of the direct importance of so much of the work in connection with the defense (later the war) effort of the nation.

A multitude of new defense establishments were created during the year—army and navy cantonments, air fields, naval bases, huge plants for the manufacture of all sorts of armaments. Many of these were built from the ground up in isolated rural sections. This meant that telephone facilities capable of handling heavy traffic had to be quickly installed in numerous areas where previously there had been little or no demand for telephone service.

Under the army's direction, systems of communication for use in the event of air attack were developed and put into service in both the Pacific and Atlantic coastal areas. These systems employ to a considerable extent the regular facilities of the telephone companies.

Work on the new transcontinental cable went forward steadily during the year, and the 600-mi. section connecting Omaha, Neb., with Laramie, Wyo., and Denver, Colo., was completed in Dec. 1941. New construction on this route was also completed between a point near San Francisco and Sacramento, Calif. Construction of the Laramie-Sacramento section was in progress in 1941 and when completed in 1942 there would be an all-cable route from coast to coast. Many other cable additions were made, including the extension of the eastern toll cable network to Norfolk, Va., and of the Pacific coast toll cable network to San Diego, Calif. Both cities became increasingly important centres of war activity.

The manufacturing and research branches of the industry were called upon to design and manufacture large amounts of communication equipment for military purposes. In the Bell Telephone laboratories alone about 100 different military research jobs were under way in the latter part of 1941 and telephone manufacturers were busy making tens of thousands of communication items for military planes, battleships, aircraft carriers and other military uses.

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(W. S. G.)

Television.

For the year 1941, as in 1940, technical advances in television appear to have been limited to those growing out of work in the United States. Because it had not been at war for the greater part of the year, the situation in the U.S. differed from that in Britain and Germany (which were formerly centres of television development). So far as is known, little television activity existed outside of the U.S.A. during 1941, and whatever was done was believed to have had a direct military application.

Progress in the U.S.A., up to December, was principally in the improvement of television as a home broadcast service. Much of what had been planned in 1940 was accomplished. The National Television Systems committee, sponsored jointly by the Federal Communications commission (*q.v.*) and the Radio Manufacturers association, rendered its report. That committee was appointed to unify the radio industry as to technical standards to be endorsed for television broadcasting, and under the leadership of Dr. W. R. G. Baker it succeeded in its task. The result was a change from the "441 line definition," previously suggested as standard, to a new value of 525 lines per picture. Definition of this order permitted television to surpass, in pictorial content, the 16 mm. "home movie" and to approach the 35 mm. professional or theatre practice. This represented about the maximum detail possible within the limitation of channels 6 megacycles in width which have been adopted for the standard or commercial home television channels in the range of 50–80 megacycles. It seemed possible that wider bands and thus still higher pictorial content might later be provided on channels of double or treble these frequencies.

In May 1941 the Federal Communications commission issued its new rules, stabilizing commercial television in line with the agreement reached within the industry and setting the date for

the change from experimental to commercial television as July 1. On that date the National Broadcasting company's New York television station WNBT began commercial operations with five sponsored programs, and television broadcasting was at last on its way to a self-supporting basis parallel to that of sound broadcasting. Other television broadcasting stations which went into either experimental or commercial operation are WCBW of the Columbia Broadcasting system and W2XWV of Dumont, in New York, WRGB of the General Electric company in Schenectady, N.Y., WPTC of Philco in Philadelphia, Pa., WTZR of Zenith in Chicago, Ill. and KTSL of Don Lee in Hollywood, Calif.; all of these adopted the new 525-line standard operation with the new transmission standards.

Television receivers in which the images are projected from a relatively small cathode ray tube to a much larger screen, of moderate size for home use or great size for the theatre, were further improved and demonstrated to the public during the year. Progress in colour television continued, including its use with the newer screen-type projection receivers. Development work in improved synchronizing methods, on colour systems, the possibility of using special screen materials having the capacity of "remembering" the pictures so as to reduce flicker at substandard scanning speeds, was carried forward as far and as fast as the necessary emphasis on production and design of military radio materials would permit. However, the priorities established for war radio apparatus necessarily slowed down not only research and program development activities, but also worked against the manufacture of new receivers for use in the home. Thus, even in the cities where broadcast television programs are regularly available, the seeing audience is not growing in number as rapidly as would have been expected if the system had been permitted to get its commercial start in less critical times.

Of technical applications to military needs nothing can be said, but it is interesting to observe that the very wartime conditions that retarded the expansion of the television service turned completely about in the last month of the year and were by the end of the year actually stimulating that growth. Having encountered the obvious difficulties in training civilian defense workers rapidly and in large numbers by sending skilled lecturers and demonstrators around the cities to talk to small groups of workers, the authorities began to take advantage of the unsurpassed facility for mass instruction that could be had from television.

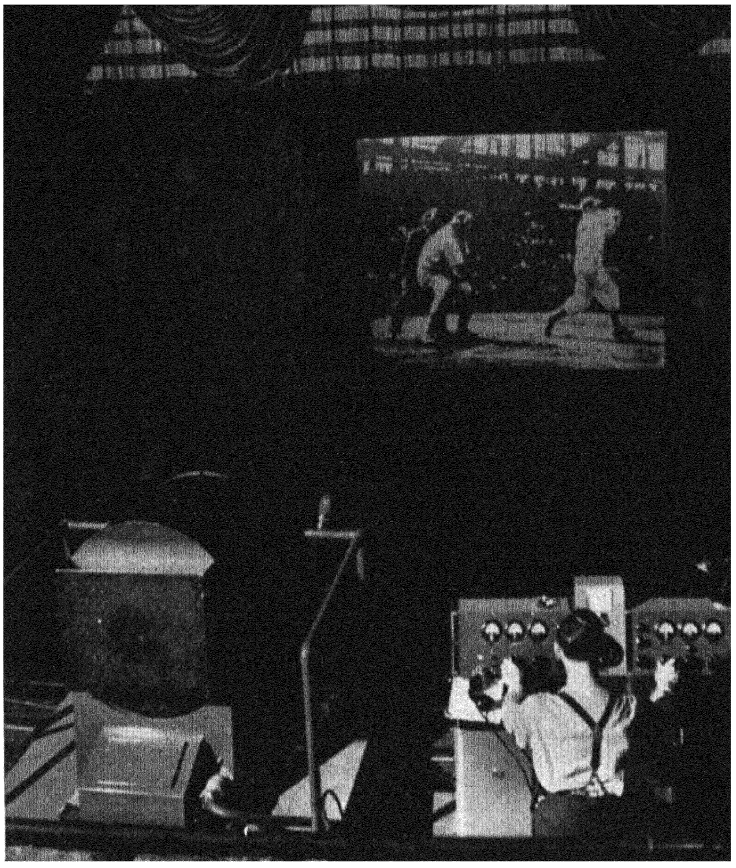
Regular instruction and demonstration programs were being put on the air from television studios in New York, Philadelphia and Schenectady, and other cities were expected to follow suit. Receivers installed in homes, as well as sets in radio stores, were made available to student fire and air-raid wardens, and these were to be supplemented by other receivers set up in police stations and other civilian defense training centres.

(J. V. L. H.)

Great Britain.—The suspension of commercial television development in Great Britain, dating from the end of 1939, continued and few contributions to the science were disclosed although considerable research was carried on in the application of television technique for war purposes.

J. L. Baird, who continued his private research on colour television, demonstrated a successful 600-line picture in April. The system, originally demonstrated in 1939, uses a cathode ray tube in conjunction with a two-colour filter. In its original form a mirror drum rotating at 6,000 r.p.m. produced a 34-line field which was interlaced three times to give a 102-line picture, the alternate fields being red-orange and blue-green. The improved system increased the number of lines to 200, which were interlaced three times to give 600 lines. It was claimed that the use of two instead of three colours enabled pictures of greater detail to be sent over the existing channels.

In December Baird demonstrated an experimental stereoscopic television image in colour. The principle involved is the transmission of two pictures in rapid sequence, one corresponding to the image seen by the right eye and the other to that seen by the left. Alternate halves of a projection lens at the receiving end are exposed by a rotating shutter so that the left and right eyes of the viewer are presented with left and right images in turn. Coloured glasses, as in the anaglyph process, are not used.



REPRODUCTION OF TELEVISION IMAGES on full-sized motion picture screens was accomplished in 1941

A novel system of scanning films using an apertured disk scanner was described by Espley and Walter. The continuously moving film is illuminated by a split optical system to remove picture flicker and a device is included for exact compensation of film shrinkage. To avoid trapezium distortion the optical system is provided with a magnification which is variable in time instead of space—the magnification of the projection system is increased for the period of the second scan in the complete picture and the pitch of the scanning spiral is also modified. The diameter of the scanning holes in the disk is only 30–40 microns.

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Tellurium. Production of tellurium in the United States rose to 85,622 lb. and sales to 88,096 lb. in 1940, both record figures. Canadian production declined by more than half in 1939, to 22,985 lb., and was not reported in 1940.

(G. A. Ro.)

Tenant House Purchase Program: *see* HOUSING.

Tennessee. A south central state, 16th to enter the union, called the "Volunteer State." Land area, 41,961 sq.mi.; pop. (1940) 2,915,841; rural, 1,888,635; urban, 1,027,206; rural farm, 1,271,944; native white, 2,395,586; Negro, 508,736; foreign-born, 11,320; other races, 199. Capital, Nashville (167,402). Other cities include Memphis (292,942); Chattanooga (128,163); Knoxville (111,580).

History.—Governor of Tennessee in 1941 was Prentice Cooper; secretary of state, Joe C. Carr; attorney general, Roy Beeler. Commissioners were as follows: agriculture, C. C. Flannery; conservation, J. Charles Poe; education, B. O. Duggan; finance and taxation, George McCandless; highways and public works, C. W. Phillips; institutions, A. T. Taylor; welfare, Paul Savage; insurance and banking, J. M. McCormick; labour, S. E. Bryant; public health, W. C. Williams; railways and public utilities, W. D. Hudson, Porter Dunlap and Leon Jourolman.

Education.—In 1940, of 5,627 elementary schools, 1,497 had three or more teachers; the number of one-teacher schools declined from 3,555 in 1927 to 2,561 in 1940. Enrolment in elementary schools in 1940 was 524,459. In 1940 there were 591 high schools with a total enrolment of 123,-

672; the number of teachers, 4,935.

The state university enrolled 7,104 pupils in 1940, with a teaching staff of 471 full- and part-time teachers. Enrolment in state teachers' colleges was 9,778 in 1940; full- and part-time teachers, 304. The state maintained seven institutions for higher learning; enrolment at the regular session was 11,847 in 1939–40.

Public Welfare, Charities, Correction.—In June 1940, 104,504 people received public assistance amounting to $4,049,000; WPA recipients, 33,600; amount, $1,608,000; old-age recipients, 40,303; amount, $406,000; aid to dependent children, 36,041 (14,187 families); amount, $261,000; aid to blind, 1,607; amount, $18,000. In 1940 there were seven correctional institutions with 4,209 inmates; expenditures, $1,165,528. In 1939, payment for unemployment compensation was $4,582,000; number of initial claims, 120,000; continued, 1,045,000. Separate schools are maintained for the blind, the deaf and the underprivileged; three state hospitals for the insane; a home and training school for feeble minded.

Communication.—In 1940, of about 82,000 mi. of public road, 7,520 were state highways; state expenditures were $10,794,757 for the year ending June 30, 1940. There were 3,573 mi. of railroads in 1941; 27 private and secondary airports; 605 mi. of airways; approximately 300,000 telephones. Water-borne commerce on the Tennessee river in 1940 amounted to 2,206,913 short tons; Cumberland river, 852,138; Mississippi river, 7,055,675 short tons from the Ohio river to Baton Rouge and 1,841,068 at Memphis.

Banking and Finance.—In 1941 there were 71 national banks with 17 branches, and 226 state banks with 33 branches; assets, $561,994,000 for national and $191,728,240 for state banks; deposits, $511,854,000 for national banks and $167,084,447 for state banks. Savings and loan associations in 1939 numbered 49, with assets of $26,948,211.

State receipts for the year ending June 30, 1940, were $72,752,466; expenditures, $70,954,907. The gross debt in 1941 was $95,120,000 and the net debt $91,133,000.

Agriculture.—There were 247,617 farms in 1940; 18,492,898 acres in farms, with 6,158,662 acres of crop land harvested. Gross value of agricultural production was $192,403,000; cash farm income, $141,256,000. Cash farm income from crops was $66,566,000; from livestock and livestock products, $58,483,000; government payments to farmers, $16,207,000. Gross farm income from crops was $86,761,000. Drought in 1941 decreased the yields of tobacco, corn and hay 5% to 10%. The forest area is about 14,000,000 acres.

Table I.—*Leading Agricultural Products of Tennessee, 1941 and 1940*

Crop	1941	1940
Corn, bu.	69,615,000	68,250,000
Tame hay, tons	2,148,000	1,974,000
Cotton, bales	600,000	509,000
Wheat, bu.	5,415,000	4,068,000
Tobacco, lbs.	91,523,000	110,348,000
Potatoes, bu.	2,604,000	3,476,000
Sweet potatoes, bu.	4,664,000	4,176,000

Manufacturing.—In 1939, 2,289 manufacturing plants yielded products valued at $728,087,825, of which $320,341,902 was added by manufacture. The number of wage earners increased from 107,645 in 1925 to 131,874 in 1939; wages paid in 1939, $109,661,769.

Table II.—*Principal Industries of Tennessee, 1939 and 1937*

Industry	Value of products	
	1939	1937
Rayon and allied products	$59,724,728	$59,132,660
Hosiery	33,798,963	29,219,241
Meat packing, wholesale	28,266,104	29,491,149
Chemicals	25,639,499	38,048,635
Cooking and other edible fats	19,787,646	36,457,022
Footwear (except rubber)	17,740,737	20,807,976
Flour and other grain mill products	16,147,788	22,673,578
Cottonseed oil, cake, meal linters	15,390,972	20,150,709

Minerals.—The total value of minerals produced in Tennessee in 1939 was $40,119,893, as compared with $32,428,512 in 1938.

Table III.—*Principal Mineral Products of Tennessee, 1939 and 1938*

Mineral	Value 1939	Value 1938
Coal	$10,402,000	$9,007,000
Stone	8,312,077	4,237,351
Cement	5,613,477	5,063,628
Phosphate rock	3,856,505*	....
Sand and gravel	1,967,356	1,605,040
Ferro-alloys	1,442,967	779,013
Lime	893,161	901,460
Coke	527,535	508,771
Clay, raw	425,008	347,035
Barite	372,348	209,040
Manganese ore	128,176	77,806

*Inc. Virginia. Value at mines.

(C. E. A.)

Tennessee Valley Authority.

The Tennessee Valley authority, a corporative regional agency of the United States government, created by Act of Congress in 1933, had, in 1941, developed a commercially useful channel in 464 mi. of the Tennessee river as far upstream as Chattanooga, Tenn., provided behind its dams 4,000,000 acre-feet of storage capacity reserved for flood control and attained an electrical generating capacity of 1,058,905 kilowatts from which electricity was being supplied to 76 municipalities and 38 electric co-operatives in the valley (which consists of portions of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia).

In the furtherance of TVA's five-fold mandate to develop navigation, flood control, electric power, national defense, and the region's agricultural economy, congress had appropriated $454,869,270 to Aug. 1, 1941 and had authorized TVA to issue $70,000,000 in bonds (of which $65,072,500 has been issued) in the largest construction and regional development programs ever directly undertaken by the U.S. government.

In addition, TVA, since its inception, had utilized Wilson dam, near the southernmost tip of the Tennessee river, representing an investment of $31,300,000.

To supply sufficient electric power to the rapidly expanding national defense industry became TVA's chief concern in 1940. The nation looked to the Tennessee valley for the bulk of its production of aluminum, a metal of vital importance to aeroplane manufacture. The Aluminum Company of America was doubling its huge plant at Alcoa, Tenn.; the Reynolds Metals company was bringing a great new plant into production at Muscle Shoals, Ala. Called on to supply swiftly mounting quantities of electric power, TVA was authorized by congress in 1940 to build Cherokee dam, on the Holston river, and the Watts Bar steam plant; in 1941, to build four dams on the Hiwassee river and its tributaries (Apalachia and Chatuge dams on the Hiwassee, Nottely dam on the Nottely river, Ocoee dam No. 3 on the Ocoee river). An agreement between the Aluminum Company of America and TVA, signed in 1941, further enhanced the amount of available power by placing the company's dams in the hands of the TVA for operation as units of the unified system. Under the contract the Aluminum company, owner of Fontana dam site on the Little Tennessee river, transferred the site to TVA, opening the way for the building of Fontana as soon as authorized by congress.

TVA's Cherokee dam was closed in Dec. 1941; the schedule called for completion of the Watts Bar, Nottely and Chatuge in 1942; Fort Loudoun in 1943; and Kentucky in 1944.

TVA dams on the Tennessee river, in the order of their progression up the 650-mi. waterway, were as follows, with those under construction in 1941 indicated parenthetically in their sequence: (Kentucky dam, mile 22.3, in Kentucky); Pickwick Landing dam, mile 206.7, in Tennessee; Dam No. 1, mile 256.8, in Alabama; Wilson dam, mile 259.4, in Alabama; Wheeler dam, mile 274.9, in Alabama; Guntersville dam, mile 349, in Alabama; Hales Bar dam, mile 431.1, in Tennessee; Chickamauga dam, mile 471, in Tennessee; (Watts Bar dam, mile 530, in Tennessee; Fort Loudoun dam, mile 602.3, in Tennessee).

Tributary storage dams built and operated by TVA are Norris dam, in Tennessee, on the Clinch river, 79.8 mi. from the mouth; and Hiwassee, in North Carolina, on the Hiwassee river, 75.8 mi. from the mouth.

Every one of the main-stream dams creates a link in a chain of lakes providing slack-water navigation the year round. Nine-foot navigation was provided by Ohio river dam No. 52 of the U.S. army engineers for a distance of 22.3 mi. up the Tennessee from Paducah, Ky. to the point at which Kentucky dam was being built. The 184.3 mi. next upstream to Pickwick Landing dam had a controlling minimum depth of 6 feet at extreme low water, but generally 7- to 7½-foot depths were maintained and the full 9-ft. channel was to be completed by Kentucky dam. From Pickwick Landing the 323.3 mi. upstream to Watts Bar, 65.8 mi. beyond Chattanooga, the then head of navigation, the 9-ft. channel was maintained, except for short stretches in which minimum controlling depths of 7 and 6 ft. remained to be increased to the standard navigation depth of 9 ft., principally by dredging. Controlling channel depth was to be increased to 9 ft. with 2-ft. overdepth, over the entire 650 mi. between Paducah, Ky. and Knoxville, Tenn., by the dams under construction and incidental development, including dredging, all to be completed in 1944.

The TVA in 1941 was supplying to municipal and co-operative systems, for distribution to more than 427,000 customers at uniformly low retail rates, electrical energy carried over approximately 5,600 mi. of TVA transmission lines, and was supplying electricity to large industrial consumers, among them the Aluminum Company of America, the Monsanto Chemical company, the Reynolds Metals company, the Victor Chemical works and the Electro Metallurgical company.

In 1941, sales of electricity by the Tennessee Valley authority amounted to approximately $21,000,000 annually. The TVA basic residential rate schedule per month was in 1941: for the first 50 kwh., 3 cents a kwh.; for next 150 kwh., 2 cents a kwh.; for next 200 kwh., 1 cent a kwh; for next 1,000 kwh., 4 mills a kwh.; for all over 1,400 kwh., 7½ mills a kwh.

TVA and 73 municipalities and co-operatives had acquired utility properties from privately owned companies for purchase prices totalling $116,700,000. TVA purchased transmission lines, generating plants and several of the smaller distribution systems for $55,500,000. The municipalities and co-operatives paid $61,200,000 for the major distribution systems and for relatively minor water and gas properties that were associated with the electrical holdings.

The total acquired distribution properties served approximately 288,135 customers in Alabama, Georgia, Mississippi, North Carolina and Tennessee. Largest single purchase was consummated in 1939 when TVA, 22 municipalities and 11 co-operatives bought all the electric properties of the Tennessee Electric Power company, serving 142,110 customers, for $78,-

600,000, of which the authority's share was $44,949,400.

Flood control by TVA dams, estimated to effect an average annual saving of $100,000,000 in flood damages on the Tennessee and portions of the Ohio and Mississippi rivers, was to be increased by addition to the system of Cherokee dam (whose reservoir would be of the heavy storage type, as were the Norris and Hiwassee reservoirs) and by construction of Apalachia, Chatuge, Nottely and Ocoee No. 3 dams. Controlled storage at TVA dams was 4,000,000 acre-feet and would be increased to 10,800,000 acre-feet by dams under construction, principally by Cherokee and Kentucky dams.

At the Muscle Shoals munitions plant, constantly maintained in a state of readiness for defense production, highly concentrated phosphate fertilizer developed by the authority had been produced to a total of more than 400,000 tons in eight years. About 138,000 tons of the superphosphate had been distributed to 35,691 privately owned farms, covering 5,446,835 acres in 29 states, where, with the co-operation of state agricultural extension services, it was used to demonstrate how an improved plant food, low in cost to the land, can aid agriculture. The authority in 1941 was engaged in rebuilding portions of the Muscle Shoals plant to produce ammonium nitrate for use in munitions. Capacity of the plant will be 300 tons a day.

A method of producing alumina, the raw material of aluminum, from abundantly available clays, was among the most important research achievements of the authority.

TVA relations with construction employees were formalized in a contract with the Tennessee Valley Trades and Labor council, representing 15 labour unions affiliated with the American Federation of Labor.

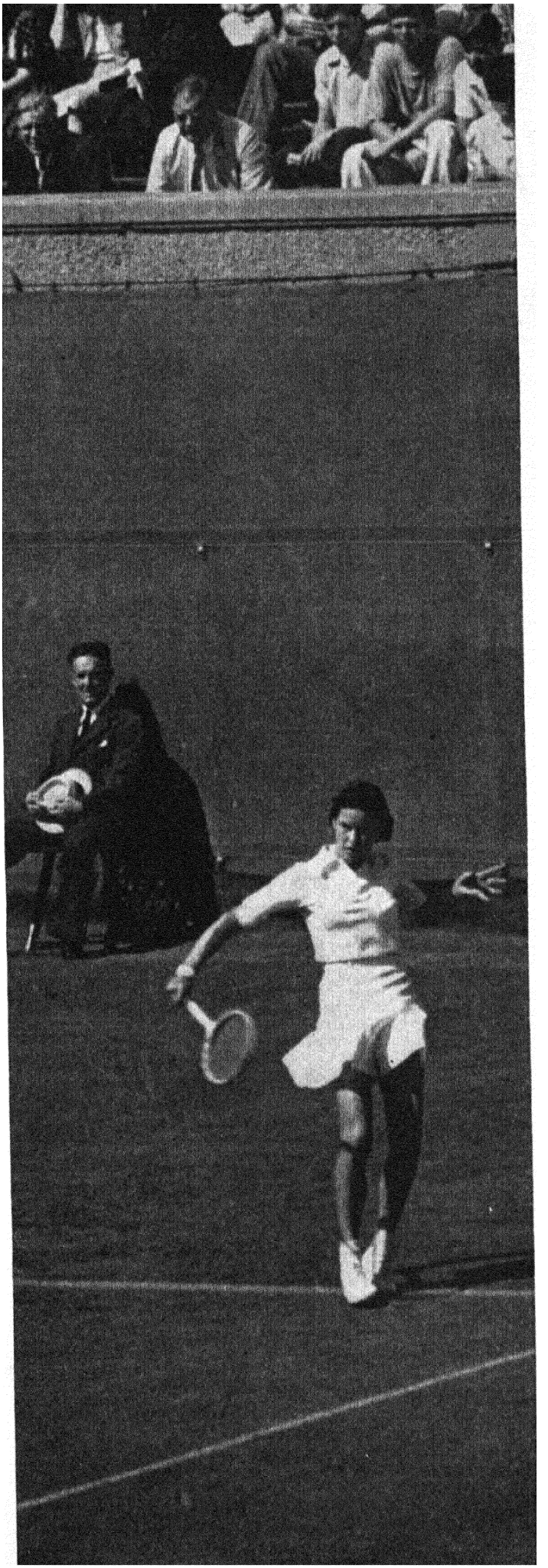
The authority was in 1941 headed by a three-member board of directors: David E. Lilienthal, chairman; Dr. Harcourt A. Morgan, vice-chairman; and James P. Pope. The board's policies were executed by a general manager, Gordon R. Clapp. (*See* also DAMS; ELECTRICAL INDUSTRIES; PUBLIC UTILITIES.) (W. L. S.)

Tennis. Competitive tennis in 1941 was largely concentrated in the United States, the only principal tennis-playing nation not actively at war (until December). Tournaments, however, were held in South America, and the championship of the Argentine was won in Nov. 1940 by Donald McNeill and Miss Dorothy Bundy of the United States. In December the largest Brazilian tournament was held in Rio de Janeiro, Elwood Cooke and his wife, the former Sarah Palfrey, being victorious.

In the U.S. two players dominated the larger tournaments during the year: Frank Kovacs and Robert E. Riggs, who was champion in 1939. Between them they won most of the tournaments held in Florida and elsewhere in the south in winter, and Kovacs defeated Riggs in the semifinals of the indoor championships at Oklahoma City, Okla., in March. Kovacs went on to beat Sabin in straight sets in the finals to win his first national title.

Frank Parker won the clay court championships at Chicago, Ill., in June, beating McNeill, the 1940 title holder, in the semifinals, and the eastern clay court championships at New York city, as well as the Spring Lake, N.J., title, which he won for the eighth time. Directly the scene shifted to grass, however, Riggs and Kovacs were on top. Riggs won at Seabright, N.J., with the loss of only one set. Kovacs was triumphant at Rye, N.Y., while Riggs beat his rival at Southampton, Long Island, in three sets. The only important tournament McNeill was able to win in 1941 was at Newport, R.I., where neither of the other two competed.

With most important foreign players busy in a grimmer game, the 60th national singles championships was held as usual early in September on the grass courts of the West Side Tennis club at Forest Hills, Long Island. Good crowds watched a tournament that was rather uninteresting until the semifinals. This round brought forth two fine matches. In the first, McNeill, playing below his 1940 form, was badly beaten by Kovacs, who played extremely well. Riggs was lucky to beat Frederick R. Schroeder in the twelfth game of the fifth set. Schroeder, who is a courageous and forceful hitter in the Californian tradition, is holder of the national doubles title with John A. Kramer, also of California. Schroeder is undoubtedly one of the most promising young players of the year. The finals were disappointing. Save in the first set, which he won, Kovacs was not permitted to play as he did against McNeill, and was hardly a factor in the match. Riggs thus recaptured his title, which he had lost the



SARAH PALFREY COOKE defeated Pauline Betz in straight sets Sept. 7, 1941 at Forest Hills, L.I. to win her first U.S. women's singles championship

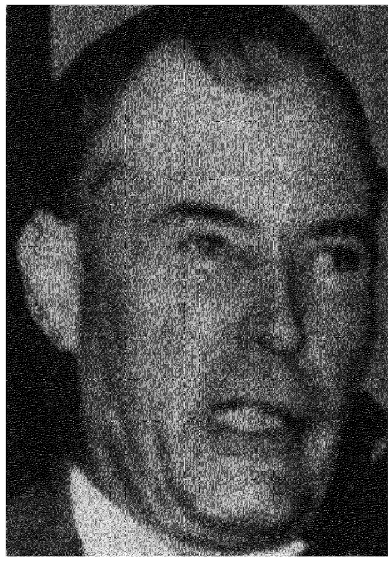
previous year. Mrs. Sarah Palfrey Cooke, playing in her third final, defeated Miss Pauline Betz and for the first time took the woman's singles title. She had already won the doubles title with Miss Margaret Osborne of California, this being her ninth title in that event. No feminine player stood out in the field as did Miss Alice Marble, who turned professional early in 1941.

Perhaps the one most important thing about tennis during the year was not the winning or losing of titles by a handful of publicized performers, but the fact that more people played the game in the United States in 1941 than ever before. The chief reason for this was to be found in the recreational program of the WPA, which since 1935 had been spending public moneys to construct and improve some 12,000 courts all over the country. These courts, as a rule, in or around cities, were open to the public on payment of a small fee. This advance in democratic recreation occurred with little notice. It was the outstanding event in the tennis world of 1941. (J. R. Tu.)

Ter Poorten, Hein: *see* Poorten, Hein ter.

Texas. A south-central state of the United States, admitted to the union in Dec. 1845; popularly known as the "Lone Star state." Area, 263,644 sq.mi. (plus 3,695 sq.mi. of inland water surface); pop. (1940), 6,414,824. Rural population was 3,503,435 or 54.6% of the total. Negroes and other non-whites constitute 14.5% of the population. Capital, Austin (87,930). The three largest cities are Houston (384,514); Dallas (294,734); San Antonio (253,854).

History.—The legislature met in Jan. 1941 to begin the longest session (170 days, until July 4), and to pass the heaviest tax bill, in the history of the state. Little other legislation of importance was enacted, except a law to repress strikes in defense industries; hostility between the governor and the legislature caused frequent impasses.



COKE STEVENSON, lieutenant governor of Texas, was sworn in as governor Aug. 8, 1941 to succeed W. Lee O'Daniel, who was elected to the U.S. senate

After the death of U.S. Senator Morris Sheppard (*q.v.*) in April, Gov. W. Lee O'Daniel called a special election for June 28, meanwhile appointing Andrew Jackson Houston, 87, son of the hero of San Jacinto to the vacant seat O'Daniel himself announced his candidacy for the office; Senator Houston died in June; and O'Daniel barely defeated Congressman Lyndon Johnson, who had the strong support of the national administration. The three leading candidates were O'Daniel (175,590 votes), Johnson (174,279), Gerald Mann (140,807); 22 other Democrats, 2 Republicans, 1 independent, 1 Communist also ran.

Coke R. Stevenson, lieutenant governor, was inaugurated as governor on Aug. 8. Other ranking officers of the state in 1941 were Gerald Mann, attorney-general; Charlie Lockhart, treasurer (resigned in October, succeeded by Jesse James); Bascom Giles, commissioner of general land office; J. A. McDonald, commissioner of agriculture; L. A. Woods, superintendent of public instruction; George H. Sheppard, comptroller. The railroad commission was composed of Ernest O. Thompson, Jerry Sadler and Olin Culberson. On Gov. Stevenson's inauguration, H. L. Winfield became acting lieutenant governor.

Education.—Elementary schools on Dec. 31, 1941 had an enrolment of 830,849 white pupils and 185,294 Negro. Secondary schools had an enrolment of 312,027 whites and 38,213 Negroes. The total teaching staff was 49,210. During the session of 1940–41 the University of Texas enrolled 11,146 students and employed a teaching staff of 594. The enrolment of other state-supported colleges in 1940–41 was as follows: Texas Agricultural and Mechanical college, 8,748; North Texas State Teachers college, 6,288; East Texas State Teachers college, 3,666; Sam Houston State Teachers college, 2,614; Southwest Texas State Teachers college, 3,107; Stephen F. Austin State Teachers college, 1,842; West Texas State Teachers college, 1,914; Sul Ross State Teachers college, 1,017; John Tarleton Agricultural college, 1,642; Texas College for Women, 3,787; Texas College of Arts and Industries, 2,020; Texas College of Mines, 1,872; Texas Technological college, 5,598; Prairie View State college (for Negroes), 2,221.

Public Welfare, Charities, Correction.—In 1941, 163,910 recipients of old-age assistance received a total of $28,497,112; 2,186 blind persons received $107,150; 2,729 dependent children received $47,700. Payments for general relief to about 9,000 cases amounted to $1,022,500. The weekly average of persons employed by the WPA in Texas during 1941 was 70,589.

The state in 1941 maintained 22 eleemosynary institutions, half of them hospitals for mental and nervous cases. There were also sanatoriums for tuberculars, schools for the blind and for the deaf (white and Negro); two homes for delinquent children; two for white orphans and one for Negro; one for crippled children; a home for Confederate veterans and one for the widows of veterans. The total population of these institutions in 1941 was about 24,000.

Communication.—The state in 1941 had 23,122 mi. of state maintained highways, as follows: unimproved, 1,662 mi.; grading, small structures, 1,421 mi.; gravel, stone, etc. surface, 1,828 mi.; asphalt surface, 12,753 mi.; concrete and brick, 5,367 mi.; state park roads, 91 miles.

During the decade 1931–41 the state highway department spent an average of $42,500,000 a year, most of which was used to build new roads and bridges. Texas had over 22,000 mi. of railway track in 1941.

Banking and Finance.—On Dec. 31, 1941 there were 391 state banks in Texas, with total resources of $312,860,757.94, including savings; individual deposits of $202,571,066.83, and deposits in savings departments of $9,773,646. At the beginning of 1941 there were 446 national banks in Texas with total resources of $1,695,662,000. Total deposits amounted to $1,534,702,000. There were 129 insured savings and loan associations in Texas with total assets of $101,904,728.

Receipts of the state treasury for the fiscal year ending Aug. 31, 1941 were $202,132,389.80. Expenditures were $166,073,022.68. The state gross debt was $44,782,367.29; the net debt, $37,150,557.61.

Agriculture.—The total value of agricultural production in Texas during 1941 was estimated at $595,000,000. The total acreage harvested was about 26,836,000. The total cash income from crops, livestock and government payments amounted to $695,000,000. The year 1941 was excellent for pasture, but rains injured small grains, wheat and corn, and delayed cotton planting.

Table I.—*Leading Agricultural Products (Marketings) of Texas, 1941 and 1940**

Product	1941	1940	Product	1941	1940
Cotton, bales	2,787,231	3,135,784	Oats, bu.	7,106,000	6,503,000
Cottonseed, tons	891,916	1,003,453	Corn, bu.	12,335,000	11,463,000
Wheat, bu.	35,868,000	24,934,000	Grain sorghums	15,824,000	11,430,000

*Courtesy Bureau of Business Research, University of Texas.

Manufacturing.—According to the 1940 census, the value, in 1939, of products manufactured in Texas was $1,530,220,676. In the same year, 19,531 salaried persons and 126,992 wage-earners were employed (on an average) in the 5,376 industrial establishments. Salaries paid amounted to $43,677,071, and wages amounted to $128,138,703.

Table II.—*Principal Industries of Texas, 1939*

Industry	Value of Products	Industry	Value of Products
Petroleum refining	$698,850,077	Flour and grain mill products	$41,250,858
Meat packing, wholesale	85,461,048	Oil-field machinery	41,149,017
Nonferrous metals, products	82,377,947	Bread, bakery products	32,994,866
Cottonseed oil, cake, meal, etc.	44,406,882	Nonalcoholic beverages	24,459,290

Mineral Production.—The total value of mineral production in Texas during 1941 was estimated at about $750,000,000. About 90% of the total value was from petroleum products (oil and gas). No important new oil fields were discovered during the year. The value of oil production in 1940 was estimated at $488,194,740.

Table III.—*Principal Mineral Products of Texas, 1939 and 1938*

Mineral	Value, 1939	Value, 1938	Mineral	Value, 1939	Value, 1938
Oil	$478,330,000	$539,150,000	Cement	$12,152,780	$11,488,866
Natural gas	141,535,000	133,486,000	Carbon black	11,102,763	10,052,206
Sulphur	28,498,473	(unavailable)			
Natural gas gasoline	25,807,000	19,781,000			

(C. W. Ra.)

Texas, University of. An institution of higher education at Austin, Tex. The 59th annual session opened Sept. 19, 1941. Main library holdings climbed to the 675,000 volume mark. With a 25% increase in state appropriations for the 1941–42 fiscal year, the university increased its teaching staff to 615 members and expanded graduate work and research. A total of 167 new courses were added, thus bringing the total to 1,379 in 46 fields. Courses in subjects relating to national defense were strengthened, defense activities were co-ordinated under a student-faculty committee, and women students registered for civilian defense services in a campus-wide program. Research projects dealing with national defense were speeded up. During the spring semester of 1941, 700 men were trained in 28 special defense engineering short courses, and this program under the U.S. Office of Education was greatly expanded in the fall. The medical branch embarked on a large-scale program of research and service, including cancer research; it operated 12 months, instead of 9, during the academic year, to speed up the training of doctors and nurses for army and navy service, and installed a U.S. army surgical unit. Enrolment at the main university totalled 9,411 as of Oct. 1, 1941, and at the medical branch 414 in the School of Medicine and 183 in the College of Nursing. (H. P. R.)

Textile Industry. The boom which the national defense program brought to the textile industry in 1940 continued at an accelerated rate in 1941 and reached new all-high production peaks. As Pearl Harbor transformed the defense program into a war program in the closing weeks of the year, it became evident that another year of record production was ahead.

Textile World's index of mill activity for 1941 was 188, on the basis of 1923–25 as 100. This represented an increase of one-third over the index of 142 for 1940, which in turn was 8% over the 1939 index of 132, which again was 28% over the 1938 index of 103. In other words, textile activity in 1941 set a new annual high for the third successive time.

By individual branches of the industry, cotton consumption in 1941 exceeded that of 1940 by about one-third; wool consumption increased by at least one-half; silk, on the way out, dropped more than one-third; filament rayon made a gain of about one-sixth; and rayon staple use increased about one-third.

U. S. Consumption of Textile Fibres, 1941
(In millions of lb.)

	Cotton	Silk	Wool	Rayon
January	415.7	3.3	46.9	35.0
February	390.4	3.4	47.0	31.6
March	420.5	3.2	53.0	35.4
April	453.1	2.9	52.8	38.7
May	454.4	2.9	57.0	40.2
June	430.9	3.1	55.7	38.3
July	457.5	3.6	53.3	39.4
August	430.1	0.3	53.5	37.3
September	430.8	0.6	58.6	37.0
October	469.2	0.5	60.6	41.7
November	418.0	0.8	51.5	38.5
December	436.6			39.3
Total	5,207.2			452.4

Statistics from *Rayon Organon*.

Silk Crisis.—The most dramatic phase of the year 1941 in textiles was the Japanese crisis in the summer, which led to a government order freezing all stocks of raw silk. This was the first taste the U.S.A. had of the privations which were in store for it as more and more materials and products came into short supply for civilian use. Women stormed the retail counters. Hosiery mill employees were thrown out of work, and here too was the first opportunity for the country to get a preview of what was going to happen in the way of dislocation of labor through the transfer of emphasis from civilian production to wartime production. Mills started to switch hurriedly to other materials, principally rayon, but even the supply of that material was not ample. Nylon production continued to increase, but it promised to come more and more into demand for government use. The prospect ahead for the silk hosiery industry was not bright. There were many problems ahead, particularly in connection with the appearance and wearing qualities of the hosiery made out of new materials. Eventually, of course, this production problem would be overcome.

Organized Research.—One of the most important developments during 1941 was the crystallization of a well organized plan of co-operative research. This was brought about by a working arrangement effected between the Textile foundation, a semi-government organization, and the Textile Research Institute, Inc., by which the latter would gradually become the centralized research organization in the industry. This revitalized program was held generally as a most essential step, in view of the demands which conservation, substitution and simplification problems were going to place upon the technique and economics in textile manufacture and distribution. (*See* also COTTON; RAYON; WOOL.) (D. G. Wo.)

Thailand (Siam). A kingdom of southern Asia between Burma and French Indo-China, extending southward into the Malay peninsula; area 198,247 sq.mi.; pop. (census 1937) 14,464,489, (est. 1940) 15,718,000. Chief towns: (pop. 1937) Bangkok (cap. 681,214); Chiengmai (544,001); Khonkaen (473,475); Chiengrai (443,476). Ruler: King Ananda Mahidol; language: Siamese; religion: Buddhism. Thailand was occupied by Japan Dec. 8, 1941.

History.—In January 1941 Japan offered to mediate in the hostilities which had broken out at the end of 1940 upon the Vichy government's refusal of Thailand's territorial demands in Indo-China. Both France and Thailand accepted the mediation offer, and hostilities ceased Jan. 28. After several prolongations of the armistice, an agreement was signed in Tokyo March 11, and a treaty and two protocols were signed May 9. France ceded some 25,000 sq.mi. of territory, including the districts of Paklay and Bassac and a large part of Cambodia. The ceded districts were to be demilitarized. Japan guaranteed the settlement, and both Thailand and France undertook not to make any agreement with a third power directed against Japan.

On March 12 Thailand resumed diplomatic relations with the U.S.S.R., which had been interrupted since 1917, and recognition of Manchoukuo was announced in August. A Japanese ambassador to Bangkok was appointed in the same month for the first time.

A tense situation arose when Japan occupied south Indo-China in July and stationed mechanized troops near the Thailand border. Thailand stated at the time that it would fight in defense of its independence against any aggressor. On August 6, U.S. Secretary of State Hull stated that a Japanese move into Thailand would be regarded as threatening U.S. security in the Pacific, and Anthony Eden said in parliament that any action threatening the independence of Thailand would be a matter of immediate concern to Great Britain.

Japan, faced with this united opposition to further aggression declared war upon the United States and Great Britain Dec. 7, 1941 before proceeding to the invasion of Thailand. The 100,000 Thai troops offered little resistance and soon laid down their arms altogether at the command of their government. The government on Dec. 8 readily acceded to the Japanese ambassador's

request that Japanese troops be permitted to march through Thailand. (*See* also WORLD WAR II.) (M. Cs.; X.)

Education.—In 1938–39: government schools 429; scholars 61,297; local public and municipal schools 11,072; scholars 1,484,483; universities 2; students (1937) 11,525.

Banking and Finance.—(1941) revenue est. 137,969,000 baht; expenditure, capital (est. 1941) 56,056,000 baht; public debt (Jan. 1, 1940) 72,400,000 baht; notes in circulation (Sept. 30, 1940) 202,000,000 baht; reserves (Sept. 30, 1940) gold 97,000,000 baht; foreign assets 122,000,000 baht; exchange rate (average 1940) 1 baht=35.15 cents; (June 1941) 1 baht=36.97 cents.

Trade and Communication.—Foreign trade 1939–40 (merchandise): imports 194,686,000 baht; exports 216,268,000 baht. Communications: roads, state highways completed (1938) 1,815 mi.; railways, open to traffic (1938) 1,925 mi.; airways, length of route opened (1938) 444 mi.; motor vehicles licensed (1937–38): total 11,439 (cars 5,910; lorries 4,233; buses 146; cycles 559); wireless receiving set licences (1938) 29,834.

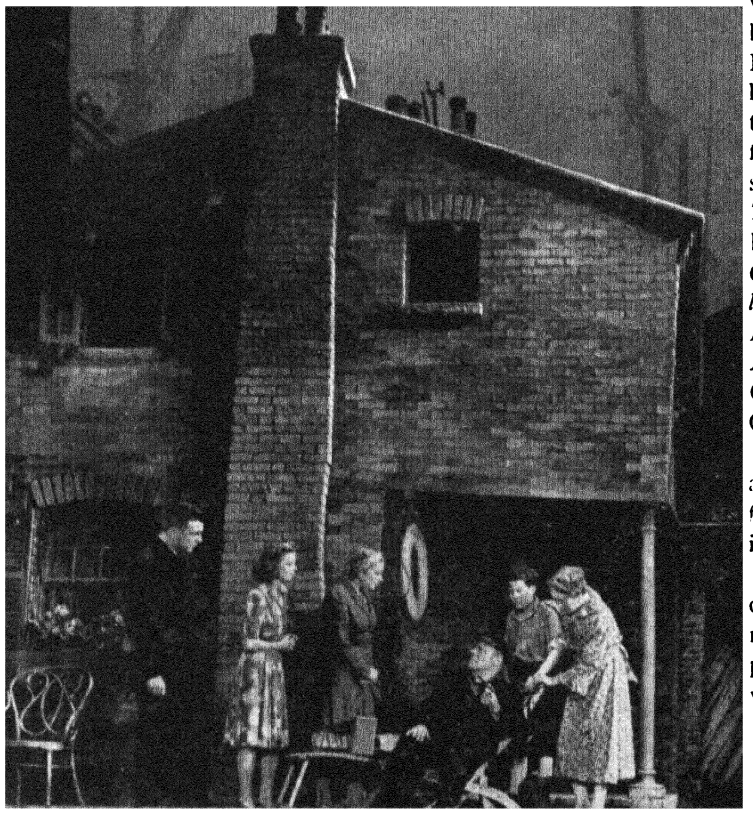
Agriculture and Mineral Production.—Production (in metric tons): rice (1939–40), 5,082,700; rubber (1939, exports) 42,000; tin ore, metal content (1939) 17,300; tobacco (1938–39) 20,400; cotton ginned (1938–39) 1,200; maize (1938–39) 5,600.

Theatre.

The prosperity of the theatre in the United States during 1941 was hardly matched by dramatic quality. A number of plays with a successful popular appeal saw production and in the lot there were several that made an honest gesture toward critically reputable drama, but none could soundly be listed in the catalogue of real importance. In this situation, the New York Drama Critics' Circle waywardly bestowed its award for the relatively best American play of 1941 on Lillian Hellman's anti-nazi *Watch on the Rhine*, with William Saroyan's superior *The Beautiful People*, which was financed into a run of 64 performances by the author, as the runner-up. The ballot was 12 to 6. The Pulitzer award was eccentrically given to a play produced in the previous season, to wit, Robert Sherwood's *There Shall Be No Night*.

The year was further disappointing in the critical collapse of playwrights who in the past have been looked to for drama of some standing. Maxwell Anderson's anti-nazi *Candle in the Wind* indicated a sharp decline even from his antecedent *Journey to Jerusalem*, and had to rely on Helen Hayes's popularity for box-office life. S. N. Behrman's anti-dictator *The Talley Method* was considerably inferior to much of his previous writing and, for all of Ina Claire's presence in the cast, was a quick failure. Elmer Rice's anti-nazi *Flight to the West* was feeble dialectic melodrama

FREDERICK BRENNAN'S *The Wookey*, first U.S. play about England in the latest war, opened on Broadway in Sept. 1941, with realistic settings by Jo Mielziner



and got only a short distance. Paul Green's dramatization, with the author, of Richard Wright's plea for justice to the Negro, *Native Son*, missed most of the novel's vitality. And so with the others.

It became markedly evident that what was largely the reason for the native drama's debility was the determination of the playwrights, both established and novice, to convert the stage into a medium for propaganda and to sacrifice what artistic talents they might possess to an indignant exposition of the crimes of Hitler, the barbarism of racial intolerance, the danger to the democratic ideal and ideologies of a piece. The result was a stage that took on more and more the aspect of a soapbox and the drama more and more that of a patriotic—and at times gratuitous—rally.

It was to the exhibits designed purely for light amusement that the theatre had consequently to look for its share of critical reason. The plays and shows in this category were all that the drama in the higher category was not. Among the pleasures in this direction, produced specifically in 1941, were Joseph Kesselring's *Arsenic and Old Lace*, a hilarious farce treating of mass-murder; Owen Davis' and the Lockridges' *Mr. and Mrs. North*, an entertaining family-detective lark; Francis Swann's *Out of the Frying Pan*, a comedy about youngsters struggling to get a foothold in the theatre; Rose Franken's *Claudia*, a perceptive comedy dealing with a young girl's difficult adaptation to the marriage state; Noel Coward's *Blithe Spirit*, a gay farce having to do with returned wifely ghosts; etc.

In the department of musical shows, there were *Lady in the Dark*, with Gertrude Lawrence triumphing beautifully over a dubious Moss Hart book; the Porter-Fields *Let's Face It*, a very sprightly specimen of its genre; George Jessel and company's burlesque-flavoured and ribald *High Kickers;* Sigmund Romberg's melodious *Sunny River;* the Olsen and Johnson insane *Sons o' Fun;* etc.

And, in both categories, such prosperous hold-overs from the previous season as *My Sister Eileen* and *Hellzapoppin, Life with Father* and *Panama Hattie*, and *The Man Who Came to Dinner* and *Cabin in the Sky* and *Pal Joey*.

But if the year was not notable for dramatic quality, there was no doubt as to its quality in acting performances. The outstanding of these was that of Judith Anderson as Lady Macbeth in the Maurice Evans-Margaret Webster revival of the Shakespearean tragedy. With one voice, the critics hailed it as the finest they had seen. The hitherto applauded Evans, however, disappointed his audiences; his Macbeth was largely a recitation, as such satisfactory enough but leaving much to be desired in the more important direction of acting. Other first-rate 1941 examples of the histrionic craft, however, were sufficiently provided by Ina Claire in the aforementioned *The Talley Method*, Helen Hayes and John Wengraf in *Candle in the Wind*, Paul Hernried in *Flight to the West*, Dorothy McGuire in *Claudia*, Katharine Cornell in the revival of *The Doctor's Dilemma*, Canada Lee in *Native Son*, Paul Lukas in *Watch on the Rhine*, Edmund Gwenn in *The Wookey*, Bobby Clark in *All Men Are Alike*, Flora Robson in *Anne of England*, Grace George, C. Aubrey Smith and Joseph Buloff in *Spring Again*, Cornelia Otis Skinner in *Theatre*, and others.

The little summer theatres, numbering more than 80, prospered as they had never before, many of them turning a profit for the first time. Business with many of them was so surprisingly good, indeed, that their seasons were extended.

The National Theatre Conference, which embraces not only independent little theatres throughout the country but those connected with the colleges and universities, broke away from its principle of attempting to duplicate plays that have had a Broadway production and for the first time essayed, and successfully,

the presentation of a completely new work, Saroyan's *Jim Dandy*.

The professional road theatres again indicated that their patronage was reserved mainly for companies headed by star actors and actresses. The Lunts, Helen Hayes, Katharine Cornell, Tallulah Bankhead and such thus played to big trade, whereas other players, with names less well known, frequently found sparse audiences. The chief exceptions were, again, the plays *Tobacco Road* and *Life with Father,* which drew audiences despite relative unfamiliarity with their leading actors.

Conspicuous American playwrights who failed to provide productions during 1941 included Eugene O'Neill, who, though he had completed two new plays, announced that he did not care to venture production until 1942 or maybe 1943; Robert Sherwood, who temporarily abandoned dramatic composition in favour of government service in connection with the war; Sidney Kingsley, who had finished a play on Thomas Jefferson but whose service in the army temporarily delayed production; John Steinbeck, who was working on a play in novel form, much after the manner of his *Of Mice and Men;* George Kelly, Marc Connelly and Thornton Wilder.

One of the most encouraging things about the theatre was the failure and closing of the great number of plays whose signal lack of merit was discernible at one and the same time to both the professional critics and the lay audiences. Some of these plays lasted but a single night; some but two or three; and others, despite attempted forcing, expired forlornly in a week or two. It became evident that no longer, as in other days, could producers foist upon audiences wares that were worthless—and, to give them their due, the producers themselves seemed to concur.

A concluding word on revivals. In the case of Shakespeare, aside from the *Macbeth* already noted, there was a wretched *As You Like It,* with Helen Craig an amateurish Rosalind, and a badly bungled *Twelfth Night,* vouchsafed by the Chekhov Theatre studio. The Theatre Guild offered a poor revival of O'Neill's *Ah, Wilderness!* and a jazzed one of Sheridan's *The Rivals.* The Cornell revival of Shaw's *The Doctor's Dilemma* was capital, and the Experimental Theatre's *The Trojan Women* a prime disaster.

(G. J. N.)

Statistics of the Theatre in New York City, 1941 and 1940

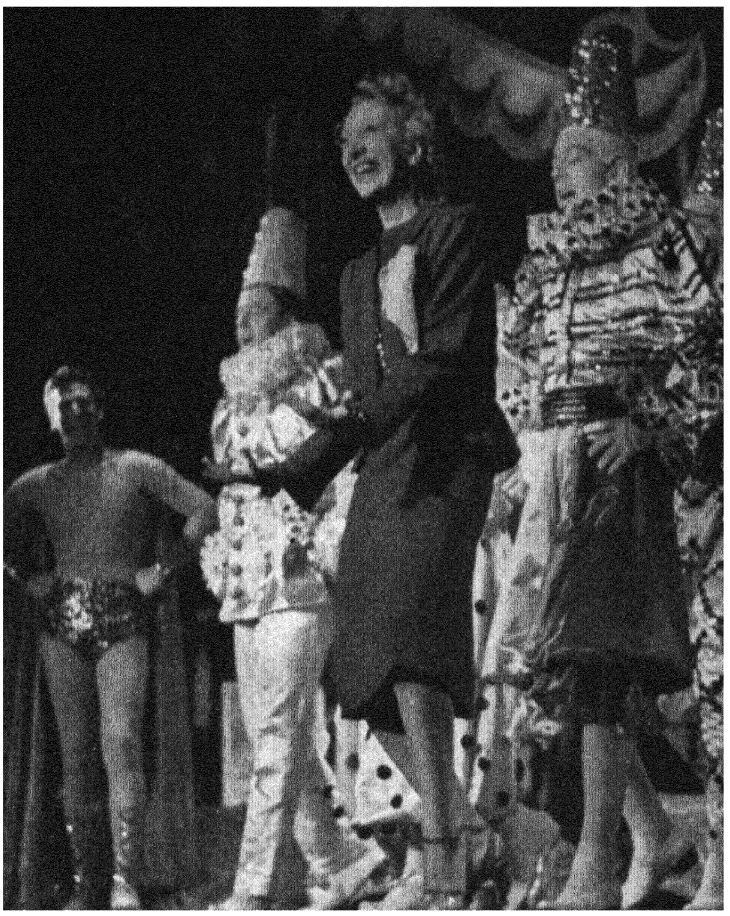
	1941	1940
Productions	94	116
Musical comedies	20	29
Plays	74	87
Premières	69	75
Successful productions	21	22
Performers employed	1,414	1,659
Tickets sold	7,360,000	6,048,000
Approximate cost of productions	$2,000,000+	$2,000,000
Estimated number of shows booked for other cities	106	103

(X.)

Great Britain.—In Shakespeare's time the actors left London and went on tour when the plague was visiting the city and it was deemed politic to close the theatre. Modern warfare, with its plague of bombing, had much the same effect on the British theatre in 1941. Most of the leading players went in and out of London in the course of presenting old successes and spent much of their time in winning new audiences in the country.

John Gielgud, for example, with an all-star cast, revived Barrie's *Dear Brutus,* which seemed profound during World War I but now struck some people as rather whimsy and flimsy. It was a beautifully staged and superbly cast production and, after a spring season in London, it had a long and popular tour, during which Gielgud could think out the plans for a more important matter, his production of *Macbeth.* Noel Coward, returning from his travels, gave London the benefit of a new play. His *Blithe Spirit* is a very light, almost farcical, comedy about a too successful essay in spiritualism which lands a man with the spook of his last wife as well as with the continuing presence of his present one. It is the kind of joke that might easily seem to be in the worst of taste, but the whole was written and produced in a sufficiently fantastic way to make death and its survival seem a laughing matter. At any rate, the public laughed in large numbers. Another new piece was *The Nutmeg Tree,* an agreeable comedy by Margery Sharp, with a nice part for Yvonne Arnaud. But for the rest, novelties were scarce.

Serious plays about the war were written but laid aside. Those who live amid bombs and gunfire do not wish to be reminded of them in their hours of relaxation. The *Journey's End* of World War I followed it at an interval of ten years. The *Journey's End* of World War II is being laid up in the consciousness of some author and even, perhaps, put to paper. But it will not be acted just yet. The immediacy of total war is too tragic for immediate tragedy.



THE MOST NOVEL PLAY of Broadway's 1940–41 season was *Lady in the Dark,* a drama-musical about psychoanalysis, written by Moss Hart. Gertrude Lawrence (second from right) played the lead

The classics, new and old, had their appeal. The "Old Vic" company presented both in London and on tour, assisted by C.E.M.A. (Council for the Encouragement of Music and the Arts), Shakespeare's *King John* and Chekhov's *The Cherry Orchard.* The dramatic work of C.E.M.A. expanded considerably during 1941, and special tours were organized in industrial areas and villages, which included a repertory of authors including Euripides, Shakespeare, Milton, Shaw, Chekhov, Bridie and T. S. Eliot. This organization, enjoying government support and charged with the double duty of keeping alive the best and taking it to the most, so far justified itself that it easily might become the origin of important future developments in publicly assisted drama.

There was no doubt that the public, especially in the big towns, wanted entertainment which would take them out of, rather than into, themselves. The decorative, rather than the intellectual, pleasures of the theatre prevailed. The vogue for ballet and opera continually increased and the Sadler's Wells teams had an immense welcome wherever they went. A new ballet company called the International visited London and was encouraged to prolong its stay. The famous French mime *L'Enfant Prodigue* was also successfully revived for the fourth time in 50 years, another sign of affection for the pleasures of the painted stage.

There was also an obvious eagerness to see "star" performers and radiant personalities. Miss Vivien Leigh, coming from her world-conquering appearances on the screen, appeared in a revival of Bernard Shaw's *The Doctor's Dilemma,* and this drew enormous houses in the provinces. Despite the fact that Mr. Shaw has a big film public, it would be absurd to suppose that the glamour of Miss Leigh's presence did not affect the box office. Mr. Shaw offered no new play, but Sean O'Casey had one published, *The Purple Dust,* a hilarious comedy, which was expecting production.

(I. Br.)

Theosophical Society, The.

An international organization for promoting the brotherhood of man, regardless of race, creed or colour. The sole prerequisite for fellowship is a belief in the principle of universal brotherhood and an earnest desire to make it practical. The society is strictly nonpolitical and unsectarian. It is composed of autonomous lodges and national sections, with international headquarters at Point Loma, Calif., U.S.A. The leader, Dr. G. de Purucker, under the constitution has paramount authority in all matters concerning the general welfare of the society. No officer or fellow receives any salary for his theosophical work.

The society is inspired by the principles of theosophy, which may be defined as a formulation by great seers and sages of the origin, structure, operations and evolution of the universe and

man, but its fellows are not asked to subscribe to any creed or dogma. The society was established by Helena Petrovna Blavatsky and others at New York in 1875, and spread widely throughout the world. Its work is carried on by the publication of books and magazines in many languages, public and private meetings, lectures and study classes, etc. The curriculum of Theosophical university at Point Loma includes among other collegiate courses special courses in theosophy to prepare students to work in the theosophical field. Special training is given in the religious and philosophical subjects of former ages, including all languages in which these are found. (J. H. FL.)

Therapy: *see* SERUM THERAPY; CHEMOTHERAPY; MEDICINE.

Thompson, James Westfall (1869–1941), U.S. historian, was born June 3 in Pella, Ia. He received his Ph.D. at the University of Chicago and was a faculty member of the university's history department from 1895 to 1932. He was professor of European history at the University of California, 1932–39, and professor emeritus after 1939. An internationally known scholar in mediaeval history, Thompson regarded his last work, completed in June 1941, *History of Historical Writing*, as his chief contribution to historiography. His other publications include: *Wars of Religion in France, 1559–1576; The Huguenots, Catherine de Medici and Philip II* (1909); *The Last Pagan* (1916), *The Lost Oracles* (1921); *Feudal Germany* (1929); *The Living Past* (1931); *The Medieval Library* (1939); and *Literacy of the Laity in Middle Ages* (1939). He died in San Francisco, Sept. 30.

Thompson, Reginald Campbell (1876–1941), British archaeologist and Assyriologist, was born Aug. 21. After studying at St. Paul's school and Caius college, Cambridge, he became assistant in the Egyptian and Assyrian department of the British museum. From 1907 to 1909 he was assistant professor of Semitic languages at the University of Chicago. He was later commissioned by the British museum to conduct excavations at Nineveh, Carchemish, Abu Shahrein, Wadi Sarga and Behistun. Dr. Thompson was author of *A Dictionary of Assyrian Chemistry and Geology* (1936), and *Digger's Fancy* (1938). During World War I he served in the British Intelligence service in Mesopotamia and was promoted to the rank of captain. In World War II he acted as home guardsman. Dr. Thompson died during the week end of May 24, it was reported from London.

Thyroid: *see* ENDOCRINOLOGY.

Tibet. A country of central Asia, lying N. and N.E. of the Himalayas, mainly a high tableland. Nominally a Chinese dependency, it is in practice independent. Area, about 450,000 sq.mi.; estimates of the population vary from 750,000 to 6,000,000; 2,000,000 is probably nearer the truth. The religion is Lamaism, a late form of Buddhism modified by animism and primitive magic, and education is in the control of the many monasteries.

The boy Lhamo Dhondup (born in Dec. 1933) who was discovered in 1939 after a search lasting some years and officially recognized as the 14th dalai lama, was enthroned at Lhasa in 1940 as Lingerh Lamutanchu. The British and Indian governments alone sent missions, B. J. Gould, political officer for Sikkim representing both.

The dalai lama and his cabinet received the approval of the Chinese national government at Chungking, and diplomatic interchange between the countries was resumed. Internal peace seemed to be more assured in 1941, although nationalists were working toward the transformation of Tibet into a modern state.

BIBLIOGRAPHY.—Theos Bernard, *The Land of the Thousand Buddhas* (1940).

Timber: *see* LUMBER.

Timoshenko, Semyon Konstantinovich (1895–), Russian army officer, was born in Furmanka, Bessarabia, of peasant parents. He was drafted into the imperial army, 1915, and joined the Red army during the revolution of 1917, winning renown as a guerrilla leader. After the revolution, he studied strategy in Soviet military academies, and from 1935 to 1938 he commanded a number of Russian military districts. During the Russo-Finnish conflict, 1939–40, Timoshenko built a replica of the Mannerheim line just behind Russian positions and had his troops rehearse every operation before attacking the Finnish chain of fortresses. On May 8, 1940 he was appointed people's defense commissar and was given the rank of marshal, but he was transferred from this post July 20, 1941, and took active command of Russian armies on the western zone of the German-Russian front. In the early stages of the German-Russian war, Timoshenko's armies were compelled to fight defensive actions because of nazi superiority in mechanized power. On Oct. 23, 1941, he was shifted to the southern front; a month later he opened a surprise offensive, recaptured Rostov and Taganrog and routed the German armies of Gen. von Kleist. Timoshenko's brilliant coup paved the way for Russian offensives along the entire Russo-German front and established his reputation as one of the ablest generals of World War II (*q.v.*).

Tin. War demand increased the world tin output in 1940 to a new record high at 237,800 long tons, an increase of 28% over 1939, and 13% over the previous record of 1937. The appended table of world production includes estimates for 1941, based on the exports from leading producers during the first 10 months of the year.

World Production of Tin
(Long tons)

	1937	1938	1939	1940	1941
Belgian Congo	8,900	7,300	9,700	12,500	14,300
Bolivia	25,100	25,400	27,200	37,900	40,000
China	10,500	11,200	10,900	?	?
Dutch E. Indies	39,800	21,000	31,400	44,400	53,000
Malaya	77,500	43,200	56,000	85,400	81,200
Nigeria	10,500	7,300	10,900	10,300	11,800
Siam	16,500	13,500	17,000	17,400	16,200
World total	209,100	149,700	184,300	237,800	246,000

It is to be noted that among the countries having export quotas assigned by the International Tin committee, all except the Netherlands East Indies were consistently under-exporting, and that the total of this deficit rose to well over 50,000 tons. While it is possible that this might be taken as an indication that these countries reached their production limit, it is more likely that larger shipments were prevented by lack of adequate shipping facilities.

In 1940 imports of tin into the United States increased 78% over 1939, to the record figure of 124,810 long tons, while the total for the first three quarters of 1941 was 114,181 tons, or at an average rate of 152,240 tons for the year. It is possible though that this figure would not be maintained, as events in the far east in December disorganized shipping from this area. Deliveries to consumers in 1941 were 143,342 tons, against 115,339 tons in 1940; during the first three quarters deliveries were at a rate of 159,000 tons for the year, but were out 40% in the last quarter.

There were seven small tin smelters in operation in the United States in 1940; during the year tin ore with a tin content of 3,000 tons was imported for their use, and 1,746 tons of tin was produced. Ore receipts for these plants in the first three quarters of 1941 had 1,870 tons of tin content, of which about 60% was from Netherlands East Indies, 30% from Bolivia, and the remainder small amounts from Mexico, Argentina, South Africa, Portugal and Indo-China. In addition, 14,502 tons of tin content was received in the same period from Bolivia, for the smelter that was being built near Galveston, Texas, under government supervision; this plant was planned for 18,000 tons of metal annually, but in view of the Japanese activities that began in the Malayan area early in December, it is probable that the capacities of all plants would be increased, if the necessary ores could be secured.

The attack by Japan on Malaya, Netherlands East Indies and the Straits Settlements, which were responsible for more than half of the world's tin output in ore, and for only a slightly smaller percentage of the smelting capacity, dealt a heavy blow to the main centres of tin supply for the Allied countries. The loss of these areas, with Indo-China and Thailand, would give to Japan control of two-thirds of the tin producing capacity of the world, and reduce the potential supply of the Allies to an impossibly low level.

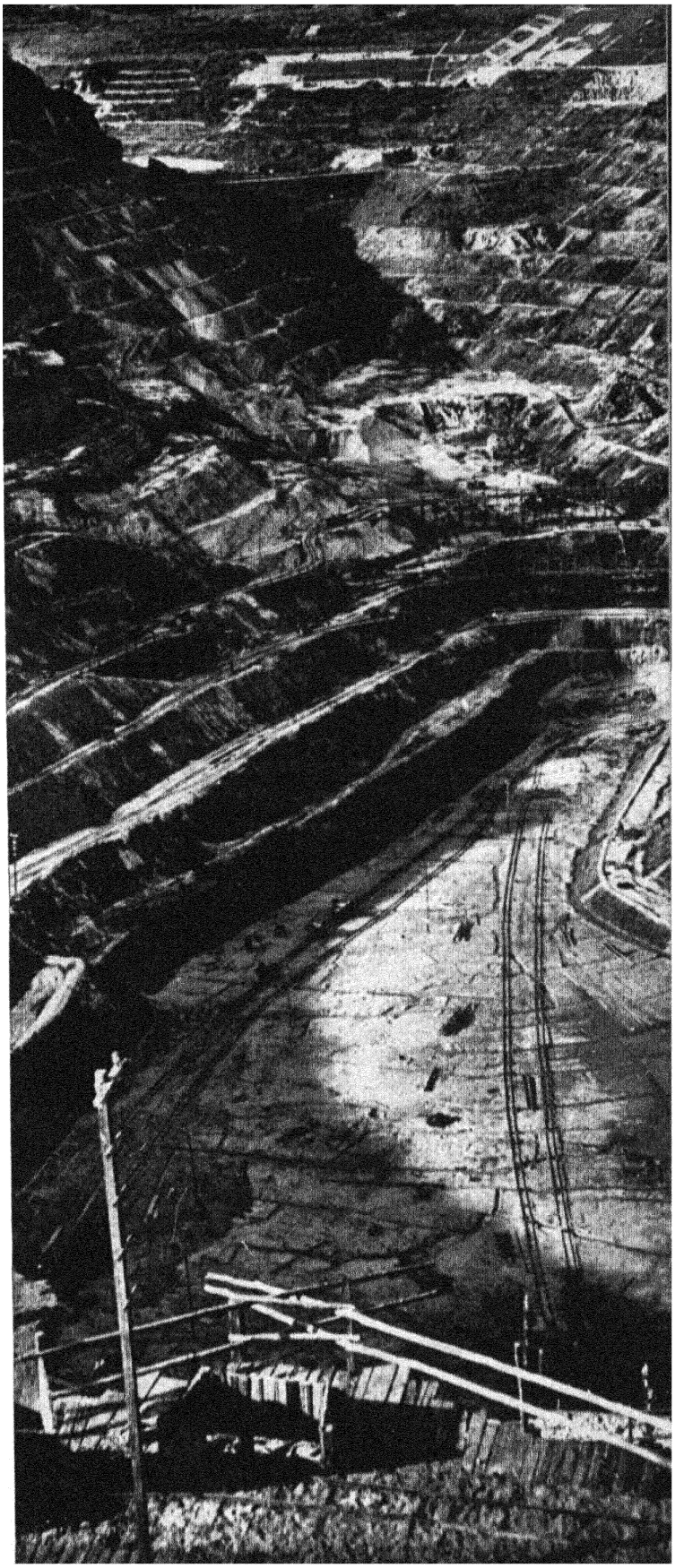
During the first half of 1941 the price of Straits tin in New York increased from 50·1 cents to 55·25 cents, later dropping to 53·0 cents, which was still considered too high, and on Aug. 16 the Price Administration set a top price of 52·0 cents for Grade A tin, 51·0 cents for 99%, and intermediate prices for intermediate grades.

(*See* also METALLURGY; MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. Ro.)

Titanium. The production of titanium ores is not reported in the United States, but was apparently increasing as the demand grew. Imports have been expanding rapidly for several years, and included 286,576 short tons of ilmenite and 442 tons of rutile in 1939; decreasing to 215,525 tons of ilmenite and 156 tons of rutile in 1940; ilmenite imports decreased again in 1941, the total for the first three quarters of the year dropping to 156,737 tons, but rutile increased to 930 tons; the ilmenite was almost entirely from India, while most of the rutile was from Brazil, with smaller amounts from Australia and India. Shortage of lead and zinc was cutting down their use in pigments, and demand was increasing for titanium. (G. A. Ro.)

Titulescu, Nicolae (1883–1941), Rumanian diplomat and statesman, was born in Craiova, the son of a prominent Rumanian jurist. Educated in Craiova and Paris, he became professor of law at the universities of Jassy and Bucharest. Titulescu entered Rumanian politics in 1912 and five years later, at the age of 34, he was appointed minister of finance. In 1927 Titulescu became foreign minister in the Bratianu government. Under his tutelage Rumania championed collective security, entered both the Balkan and Little ententes and embarked on a policy of friendship with France and the U.S.S.R. His support of a pro-French policy was so militant that his political enemies called him "foreign minister-at-large of France." Titulescu's power waned with the unopposed rise of Hitler's Germany. His countrymen had lost all faith in collective security and Titulescu was dropped from the cabinet in Sept. 1936, while he was in France. As Rumanian fascists had openly threatened to kill him, the former foreign minister was forced to remain abroad. In 1937 he returned to Rumania, but fled again to France in 1940. He died at Cannes on March 17.

(See *Encyclopædia Britannica.*)



TIN MINE in British Malaya, source of nearly a third of the world's production in 1941 before its capture by the Japanese

Tobacco. Production and distribution of tobacco in 1941 acutely reflected different governmental policies rather than economic forces. In China the Japanese continued a government policy that forbade growers to sell tobacco to United States, British and Chinese manufacturers, who previously manufactured 75% of the cigarettes produced in China. Japanese

agencies paid low prices and then forced manufacturers either to pay high prices or to import American leaf, which was difficult or impracticable. Chinese growers responded by diverting tobacco acreage to food crops; production in 1941 was only 85,000,000 lb. of tobacco compared with 123,000,000 lb. in 1940. Reports reaching the United States just previous to the Pearl Harbor raid (Dec. 7, 1941) said the Japanese had raised the price to growers 30% and, as an additional inducement, offered free lodging, medical treatment, motion picture shows and radio programs to farmers to bring their tobacco to market. In unoccupied China, efforts were being made to introduce tobacco culture in western provinces.

In the United States, tobacco production of all types in 1941 was estimated by the department of agriculture as 1,279,872,000 lb. from 1,350,000 ac., compared with a 1940 crop of 1,455,802,000 lb. from 1,407,900 ac. The ten-year (1930–39) average was 1,394,839,000 lb. and the average planting was 1,676,220 ac. The Manchurian crop in 1941 was 38,000,000 lb., as against 36,000,000 lb. in 1936. The Japanese empire (Japan, Chosen and Taiwan) reported a crop of 122,000,000 lb. of flue-cured tobacco in 1941 and 120,000,000 lb. in 1940. In Turkey, British and Germans competed actively for Turkish tobacco as well as for Turkish good will. Storage of the 1941 crop of 120,503,000 lb. became an acute problem in Turkey, as lack of Black sea shipping had prevented Germans from removing a large part of their purchases from the 1940 crop of 149,300,000 lb. Rumania increased plantings from 31,765 ac. in 1940 to 41,167 ac. in 1941, to help make up the German tobacco shortage. Rumania's crop in 1941 was 25,794,000 lb., as against 20,948,000 lb. in 1940. Canadian immigration officials authorized a special arrangement by which 1,300 United States tobacco primers and 1,300 curers were imported by motor from Virginia, the Carolinas and Georgia to help harvest and cure the 1941 crop estimated (Aug. 30) at 67,300,000 lb., compared with 60,400,000 lb. in 1940. Of the 1941 crop, 53,600,000 lb. was flue-cured (cigarette type tobacco). The Canadian government estimated 8,000,000 lb. would be shipped to Great Britain, where a tobacco shortage in the summer of 1941 resulted in voluntary rationing for a short time. The Swedish tobacco monopoly announced that one-third the space occupied by tobacco in each cigarette would be replaced by a paper mouthpiece to alleviate a tobacco shortage and save an estimated 1,800,000 lb. annually.

Cigarette smoking continued to increase in 1941 throughout most of the world. In India, for example, the increase was at the rate of 5% a year, and in 1941 the Indian government followed the example of many other countries and began training growers in the technique of producing American, flue-cured, cigarette-type tobacco. The flue-cured crop in India in 1941 was 49,427,000 lb.; it was 35,760,000 lb. in 1940. Java cut domestic plantings in 1941 and produced its largest flue-cured crop, 13,000,000 lb. compared with 4,000,000 in 1940. New Zealand increased its flue-cured crop from 2,500,000 lb. in 1940 to 3,100,000 lb. in 1941 by obtaining seed from Canada after the United States had prohibited the export of seed. Australia planned a crop of 9,000,000 lb. for 1941, but harvested only 500,000 lb. more than the 1940 crop of 5,000,000 lb. Mexico reduced plantings in 1941 because the 1940 crop of 52,300,000 lb. had created a surplus carry-over. The 1941 crop was 33,000,000 lb. Sumatra, the world's chief source of cigar wrapper, lost its European market in 1940, and reduced its 1941 crop to 15,900,000 lb. The 1940 crop was 24,500,000 lb.

U. S. Production of Tobacco by Types, 1941 and 1940

Type	1941 lb.	1940 lb.	Type	1941 lb.	1940 lb.
Flue-cured	650,605,000	756,563,000	Fire-cured	75,783,000	103,703,000
Air-cured (light)*	381,054,000	408,615,000	Cigar filler	68,183,000	68,303,000
Air-cured (dark)	34,150,000	42,518,000	Cigar binder	60,315,000	66,511,000
			Cigar wrapper	9,782,000	9,499,000

*Of the 1941 air-cured (light) crop, 351,232,000 lb. were Burley. (S. O. R.)

Tobago: *see* WEST INDIES, BRITISH.

Togo, Shigenori (1882–), Japanese statesman, was born in Kagoshima, Japan. Graduated in 1908 from the Tokyo Imperial university, where he specialized in law, he entered the foreign service in 1912. After serving in minor diplomatic posts in Europe and Asia, 1912–20, he was made chief of the first section of the European and American bureau of the foreign office, 1921–23. He headed the European and American bureau of the foreign office, 1933, and the Asiatic bureau, 1934.

Togo was ambassador to Berlin, 1937, and was appointed ambassador to the U.S.S.R. in 1938. While in Moscow, he was instrumental in negotiating agreements that ended the dangerous Russo-Manchoukuoan border incidents. He became foreign minister in Gen. Hideki Tojo's cabinet Oct. 17, 1941. On Nov. 30, 1941, Togo rejected as "fantastic" a U.S. proposal for settling the far eastern crisis and stated anew Nippon's determination to proceed with its program for a "new order in Asia." A week later Japan and the U.S. were at war.

Togoland: *see* MANDATES.

Tojo, Hideki (1884–), Japanese army officer and statesman, was born in Tokyo, the son of Gen. Eikyo Tojo, master strategist of the Russo-Japanese war of 1904–05. A graduate of the Military Staff college, in 1915, he went to Germany in 1919 as military attaché and studied military strategy. Returning to Japan, he became an instructor in the Military Staff college and subsequently filled a number of important war office posts. In 1940, the Japanese army clamoured for a stronger war policy and Premier Konoye (*q.v.*) was compelled to give the war portfolio to Tojo. On Oct. 18, 1941, Tojo, then a lieutenant general, became premier after Prince Konoye resigned under a bombardment of criticism for his failure to better relations with the United States without sacrificing Japan's ambitions to create a "new order" in the far east. Tojo also took over the war and home ministry portfolios and on assuming office, he pledged his government to adhere firmly to its pro-axis and east Asia policy. A grim foreboding of war between the U.S. and Japan was seen in his first public statement that Japan would settle the far east crisis "by quick action, not words." On Dec. 13, 1941, six days after Japan attacked Hawaii, Tojo said Japan was "fighting in self-defense and the cause of righteousness," and he cautioned the people to prepare for long, hard war.

Tokyo. The capital and largest city of Japan, Tokyo had a population (1940) of 7,001,460; area 257 sq.mi.; situated at 35° 41′ N. and 139° 45′ E. at the head of the bay of the same name on the southeast coast of Honshu, the main island of Japan. Almost 10% of the entire population of Japan proper lives in Tokyo. The city has grown substantially because of the invariable attraction of a wartime capital and because new workers are always in demand for the munitions industries. Tokyo more than doubled in population between 1931 and 1932 because of a reorganization which brought into the city administration a number of outlying communities. It is a city of striking contrasts, with large western-style office buildings in the central section and endless streets of little houses and shops, built of the familiar Japanese building materials, bamboo and clay. Its vulnerability to air attack, especially with incendiary bombs, has often been commented on. Practice blackouts are severely enforced; but there has been little indication that any elaborate system of shelters has been prepared.

Tokyo is not included in the Japanese system of prefectures, but is an independent self-governing municipality, with a city council and board of aldermen and a mayor at the head of the administration. The city budget for 1939–40 amounted to 256,394,000 yen. There were 1,906 elementary and middle schools in Tokyo at the time of the last educational census, with 1,118,399 pupils. There were 104 higher schools, including 22 universities, with 107,302 students. In 1941 there were 32 libraries in Tokyo, with a total of 1,927,382 books. The largest of these was the Imperial library at Ueno, with 875,028 volumes. Tokyo is served by a variety of means of communication, including buses, streetcars, a circular city railway, a rather incomplete subway and taxicabs. Gasoline-driven vehicles have suffered because of the war shortage of oil, and charcoal was substituted wherever possible as a source of fuel. There was rationing of rice, sugar, matches and other articles of consumption and a growing shortage of many comforts. Tokyo is the centre of one of the four main industrial regions of Japan, the others being Osaka, Nagoya and North Kyushu. (W. H. CH.)

Tomatoes. Production of tomatoes in the United States in 1941 was 24,317,000 bu. (53 lb. to the bu.) for fresh marketing and 2,730,200 tons for processing. The 1940 crop was 24,126,000 bu. for fresh marketing and 2,275,800 tons for processing. The ten-year (1930–39) average annual production was 20,238,000 bu. for fresh marketing and 1,579,600 tons for processing. (For imports of fresh tomatoes *see* MARKET GARDENING; *see* also TRUCK FARMING for lend-lease purchases of tomatoes by the U.S. department of agriculture.) The acreage for fresh market tomatoes was 201,370 in 1941, compared to 204,970 ac. in 1940 and a ten-year (1930–39) average of 183,160 ac. The acreage of tomatoes for processing was 455,310 in 1941, compared to 409,580 ac. in 1940 and a ten-year average of 372,600 ac. The yield for fresh market tomatoes was 121 bu. per ac. in 1941, compared to 118 bu. in 1940; 110 bu. per ac. was the ten-year average. The yield of tomatoes for processing was 6 tons per ac. in 1941, compared to 5·56 tons in 1940 and a ten-year average of 4·23 tons per ac. The value of the fresh market crop was $36,968,000 for the crop year of 1941, the department of agriculture estimated as against a value of $29,867,000 in 1940 and a ten-year average of $24,645,000.

U.S. Production of Fresh Market Tomatoes by Leading States, 1941 and 1940

	1941 bu.	1940 bu.
Fall crop		
Florida	560,000	640,000
Texas	330,000	780,000
Eary (1)		
Fllorida, south	805,000	935,000
Early (2)		
Florida	1,400,000	1,650,000
Texas	926,000	770,000
California	788,000	720,000
Second early		
Texas	1,892,000	2,205,000
Mississippi	462,000	522,000*
Intermediate		
New Jersey	2,100,000	2,035,000
California	1,838,000	1,892,000
Tennessee	882,000	838,000
Missouri	580,000	472,000
Late (1)		
New York	2,592,000	1,780,000
California, north dist.	1,440,000	965,000
Indiana	600,000	540,000
Michigan	680,000	465,000
Pennsylvania	528,000	408,000

*Includes some quantities not marketed and excluded in computing value of sales.

(S. O. R.)

Tongan Island Protectorate: *see* PACIFIC ISLANDS, BRITISH.

Tongking: *see* FRENCH COLONIAL EMPIRE.

Toronto. Second largest city of Canada and capital of the province of Ontario, Toronto had a population of 657,612 in 1941 and an area of 34 sq.mi. It is a well-built and prosperous city largely concerned in the industries of mining and manufacturing and in the distribution of goods. Lines of the two Canadian railways and excellent motor highways radiating from the city make it easy of access to all parts of the province of Ontario, the two adjacent provinces of Quebec and Manitoba and border points in the United States.

The city corporation, in addition to the usual municipal services, owns and operates through commissions the city and suburban street railway and bus system and the local hydroelectric system, with exclusive distribution of electricity for light, heat and power. Toronto enjoys good air service through transcontinental and local routes.

The Canadian National exhibition, in its 64th consecutive year in 1941, is said to be the greatest annual exhibition in the world; the attendance in 1940 was upwards of 2,000,000. The University of Toronto, in its many faculties, had an attendance of more than 7,000 students in 1941. (G. R. G.)

Torpedoes: *see* SUBMARINE WARFARE.

Totalitarian State: *see* EDUCATION; GERMANY; ITALY; SPAIN; UNION OF SOVIET SOCIALIST REPUBLICS; WORLD WAR II.

Town and City Planning. Planning reports from central Europe ceased to arrive in the United States. Dutch journals from Amsterdam and Leiden indicated continued planning and housing activity during the early part of 1941. An article in the *American City* for August described city planning in the soviet union.

In England, two planning journals carried throughout 1941 full accounts of planning activities in the British isles. On July 17, 1941, Lord Reith announced the creation of a council of ministers as a Central Planning authority in embryo to ensure the administration of the town and county planning acts and to carry out the recommendations of the first Uthwatt report for the post-war period. Letchworth, the first garden city in England, reported in 1941 a thriving town of 20,000 inhabitants, with 14,000 workers in factories, 300 ac. of parks and 7,000 street trees.

In the Americas, planning sessions were held at the National Conference on Planning in Philadelphia in May and at the Inter-American Congress of Municipalities in Santiago, Chile in September.

In the United States, the defense program brought about important shifts in population and produced many congested cities and towns.

Charlestown, Indiana, grew during the year from less than 1,000 inhabitants to a busy industrial town supporting a $74,000,000 smokeless powder plant. In San Diego, Calif., thousands of houses were built to house workers in the great anti-aircraft factories. Old or new plants were located in most of the important cities of the country.

In Chicago, San Francisco, Detroit, Baltimore and Richmond there was renewed activity in planning to meet changing conditions. The adoption of the Community Facilities act by congress made federal funds available to local communities for construction of facilities needed in connection with war work.

The location of war industries in many cases neglected local plans; but the second Lanham act for defense housing required that housing and community facilities projects should be checked against local plans. The National Resources Planning board cooperated with state planning boards to provide trouble-shooter consultants to aid defense areas in the preparation of local plans.

Local planning in the United States is dependent on state enabling acts. In 1941, Kansas passed a City Planning act and Michigan, Minnesota, Nebraska and Utah passed zoning acts. Michigan, Illinois and New York passed laws to provide for the creation of urban redevelopment corporations. Most American cities suffered from blighted downtown districts. The Urban Land institute issued in 1941 proposals for downtown Boston, Cincinnati and Milwaukee.

In many cities public work reserve projects were planned for execution in the post-war period. During 1941 there was accelerated activity in city planning stimulated by defense necessities which resulted in an unprecedented public opinion in favour of adequate financial support for city planning.

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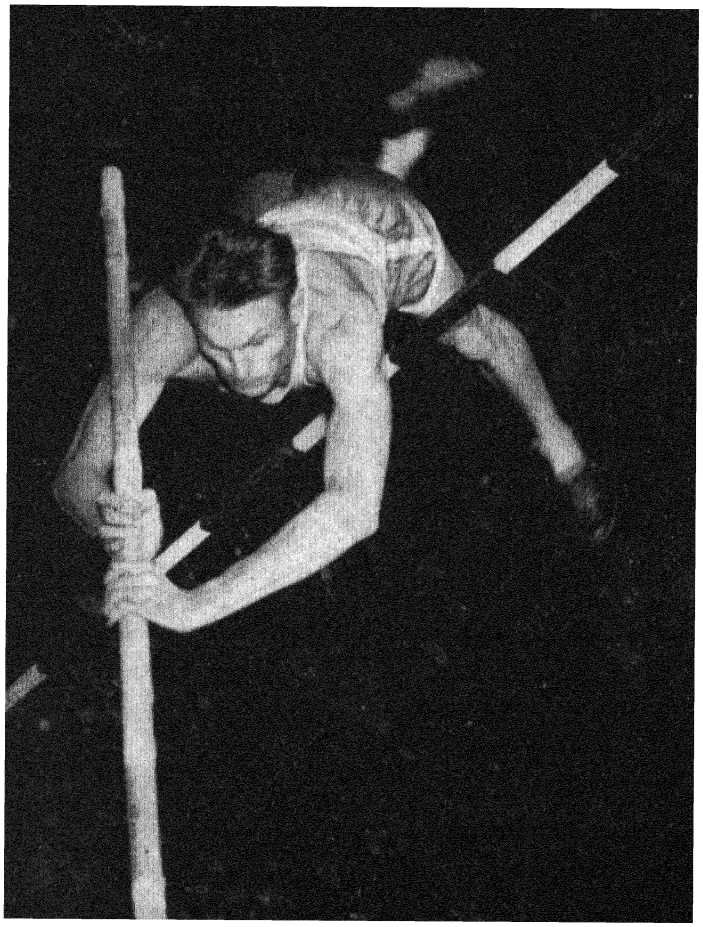
Toyoda, Teijiro (1885–), Japanese admiral and statesman, was born in August. He graduated from the Japanese naval academy in 1905 and later from the naval staff college. He was at one time naval attaché in London and attended the naval conferences of 1927 and 1930. He was a signer of the naval treaty of 1930, and in 1934 he became chief of the general affairs section of the naval technical department. In 1937 he was appointed commander-in-chief of the Sasebo naval station. He was minister of commerce in the cabinet of Premier Prince Konoye, (*q.v.*) and succeeded Yosuke Matsuoka (*q.v.*) as foreign minister in July 1941. That he was considered a moderate in his views was due, probably, to the fact that he is a brother-in-law of the head of one of Japan's five great industrial organizations, the house of Sumitomo. When Premier Konoye's third cabinet resigned Oct. 16, 1941, Toyoda was succeeded in the foreign ministry by Shigenori Togo (*q.v.*).

Track and Field Sports. Although the war caused the cancellation of the 1940 Olympic games, a new international games competition was being organized known as the Pan-American games, to be held for the first time in Buenos Aires, Argentina, Nov. 21 to Dec. 6, 1942. These games are scheduled for every four years, between olympic years. The Pan-American games, as announced by Avery Brundage, president of the United States of America Olympic committee, were being planned with Carlos Mihanovich, of Buenos Aires, a member of the organizing committee of the Argentina Confederation of Sports. Athletes from Canada, Haiti, Trinidad, Jamaica, Cuba, Mexico and each of the 21 republics in the Pan-American union would compete. Secretary of State Cordell Hull promised the full co-operation of the U.S. government because of its vital interest in the games as a means of further improving relations between the United States and the Pan-American nations.

Considered an off-Olympic year, 1941 forgot its lack of international competition and produced as brilliant a track and field season as the U.S. had ever experienced.

CORNELIUS WARMERDAM cleared the bar at 15 ft. 5¾ in.—a new world's pole-vaulting record—June 7, 1941 at Compton, Calif.



The spike-shoe idol of the United States was Gregory Rice, ex-Notre Dame star, awarded the N.Y. Track Writers association trophy as the outstanding athlete of the 1941 indoor track season. He received the same award in 1940. Winning nine straight races on the boards proved his consistency, particularly his world-record efforts at two and three miles. His two-mile mark of 8:53.4 in the New York A.C. indoor games surpassed the listed world outdoor record of 8:56 and approached within a fifth of a second of the mark credited to Taisto Maki, of Finland. He then reduced that time to 8:51.1, the fastest two miles ever run by man, indoors and out, in the feature event of the *Chicago Daily News* annual meet in Chicago.

Next for the honour of wearing the track crown in 1941 was Leslie MacMitchell (in his 21st year) because of his great progress during the year, in equalling Glenn Cunningham's and Chuck Fenske's competitive indoor mile standard of 4:07.4, in the Baxter mile, becoming the top miler of the year by virtue of his victory in five feature one-mile races during the 1941 indoor season, as well as his winning outdoors of the I.C.4-A., N.C.A.A., and A.A.U. one-mile crowns. MacMitchell had stronger competition to beat in the mile than Rice had in the two-mile and he demonstrated greater versatility. He was being primed for a 4:04 mi. or better under record-breaking conditions during 1942, according to Emil von Elling, his N.Y.U. coach, and Bob Giegengack, Fordham coach.

The far west received sectional honours in trackdom because of the supremacy of its leaders in six events of the National A.A.U. championships, in Philadelphia, Pa., which as a whole were the best ever recorded. Top performances included world's records of 15 ft. 5¾ in. by Cornelius Warmerdam in the pole vault after clearing over 15 ft. seven times in four meets; 6 ft. 11 in. by Lester Steers of Oregon in the high jump; Ben Eastman's "quarter" in 46.4 sec. was flashed by Grover Klemmer of California in the 440-yd. run; an American record of 174 ft. 8¾ in. by Archie Harris of Indiana in the discus throw; an American native record of 234 ft. 3½ in. by Bob Peoples of Southern California in the javelin throw, and a world record of 7:35.5 by California in the two-mile relay.

Klemmer also broke the 400-m. world record with a dazzling 46 sec. flat and he ran on two Golden Bear relay teams that cracked the one-mile standard with 3:09.4 and the two-mile with 7:34.5. Harold Davis equalled Jesse Owens's 100-m. figures with 10.2 sec. Fred Wolcott did 13.7 sec. over the high hurdles to equal Forrest Towne's 110-m. and 120-yd. records in the same race. Incidentally, wind invalidated a 9.2 sec. 100-yd. dash by Carlton Terry, Tex., and a 20.2 sec. 220-yd. dash by Harold Davis, of Salinas college.

Indoor Sports.—Indoor world records were eclipsed, too. John Borican suddenly turned on the power at 600 yd. and set up a new mark of 1:10.2. Al Blozis, of Georgetown, sent the 16-lb. shot to a new indoor figure of 56 ft. 2⅞ in., also making a clean sweep of every title he sought with the metal sphere. After Earl Meadows, winner of the 1936 Olympic title, went to new heights of 14 ft. 7⅛ in. in the pole vault, he predicted that vaulters would be able to clear 16 ft. and, perhaps—shades of the pioneers!—even 17 ft., with the aid of a new take-off box he has designed. Bob Wright, of Ohio State, was credited with a new indoor mark of 7.3 sec. in the 50-yd. high hurdles, clearing five hurdles instead of the customary four for the distance. Joe McCluskey, N.Y.A.C., galloped to a new world indoor record in the two-mile steeplechase in 9 min. 35.4 sec., clipping 11.4 sec. from his own indoor record made nine years ago.

Miscellaneous.—A youngster who has the makings of a second Wooderson, Lovelock, MacMitchell or Cunningham at one-mile, appeared in the person of Bobby Ginn, of the University of Nebraska, a 124-lb. sophomore. Ginn flashed a 4:10.0 performance in the California-Nebraska dual meet, at Berkeley, Cal., the fastest outdoor mile of the early 1941 summer season. Liebowitz, of Idaho, is credited with a 4:09.3 mi. in a local conference meet in Moscow, Ida.

Spectacular performances predominated during a 65th annual I.C.4-A. championships, held in Triborough stadium, on Randalls Island, N.Y., when an eight-man team representing New York university, led by Leslie MacMitchell, won the team trophy. MacMitchell not only won the

Best U.S. Track and Field Performances (Outdoor), 1941

100 Yards

9.5 sec.—Terry, Texas; Brown, Louisiana State; Turrant, Alabama State; Davis, Salinas Junior College; Jordan, So. California A. A.

220 Yards

20.5 sec—Davis, Salinas Junior College
20.6—Brown, Louisiana State
20.7—Caldwell, Moses Brown (R. I.) School; Ewell, Penn State; O'Reilly, So. California

440 Yards

46.4 sec.—Klemmer, California (World Record)
46.6—Kerns, So. California
46.9—Diebolt, New York A.C.
47.2—Barnes, California
47.5—Littler, Nebraska

880 Yards

1 min. 51.3 sec.—Kane, Indiana
1:51.7—Klemmer, California; Dale, Washington State
1:52.2—Borican, Asbury Park A. C.
1:52.3—Barnes, California; Leibowitz, Idaho

One Mile

4 min. 09.3 sec.—Leibowitz, Idaho
4:10.1—Ginn, Nebraska
4:10.4—MacMitchell, N.Y.U.
4:11.5—Peter, California
4:11.8—Kane, Indiana

Two Miles

9 min. 02.9 sec.—Rice, South Bend A.C.
9:14.4—Wilt, Indiana
9:14.5—Dodds, Ashland
9:15.0—Tolliver, Indiana
9:22.8—MacMitchell, N.Y.U.

High Hurdles

13.7 sec.—Wolcott, Texas (World Record)
14.0—Owens, Howard Payne; Wright, Ohio State
14.1—Dugger, Tufts
14.3—Batiste, Sacramento J. C.

Low Hurdles

23.1 sec.—Stickel, Pitt
23.2—Wright, Ohio State; Cochrane, Indiana
23.4—Batiste, Sacramento J. C.
23.5—Smith, Santa Ana

16-lb. Shot Put

56 ft. 6⅛ in.—Blozis, New York A. C. (American Record)
53.3⅛—Trout, Olympic Club
52.4¼—Michael, Olympic Club
51.11 —Merritt, So. California
51.4 —Harris, Indiana

Discus Throw

174 ft. 8¾ in.—Harris, Indiana (World Record)
169.8¾—Fox, Olympic Club
167.2½—Hughes, Texas
164.9 —Hahnfeldt, U.S. Navy
164.5⅞—Johnson, Ohio State

Javelin Throw

234 ft. 3¼ in.—Peoples, So. California (American Record)
227.11—M. Biles, California
226.10—White, U.S. Army
218.3 —B. Brown, Olympic Club
216.4 —Grote, Nebraska

Pole Vault

15 ft. 5¾ in.—Warmerdam, Olympic Club (World Record)
14.7 —Meadows, So. California A. A.
14.6⅜—G. Smith, California
14.6 —Schaefer, So. California
14.2 —Hunt, Nebraska

High Jump

6 ft. 11 in.—Steers, Oregon (World Record)
6.10⅜—Stewart, So. California A.A.
6. 8⅞—Wilson, So. California
6. 8¾—Berry, So. California
6. 7⅞—Walters, Baylor

Broad Jump

25 ft. 7 in.—Brown, Louisiana State
25.0—Vasconcellos, Olympic Club
24.11—Clapham, Oklahoma A. & M.
24.10—Anderson, Utah State
24. 9—Jurkovich, California

Hammer Throw

175 ft. 6¾ in.—Flaherty, New Hampshire
175.6⅛—Folwartshny, New York A.C.
173.5½—Styrna, New Hampshire
172.8¾—Wilcox, Rhode Island State
172.8½—Johnson, Cabot Mill A.C.

one-mile title, but also ran his fastest half-mile in 1:53 for his first 880-yd. victory, and unexpectedly ran the second leg on the winning one-mile relay. Norman Ewell, of Penn State, won both the 100- and 200-yd. dashes and the running broad jump. The Olympic club of San Francisco won the outdoor National A.A.U. track and field team title, and the N.Y.A.C. won the team title indoors.

Women.—Keen competition marked the National A.A.U. track and field championships for women, at Ocean City, N.J. The high spot of the meet was a new championship record in the 200-m. dash by Jane Lane, an 18-year-old senior at Wilberforce university, who beat Stella Walsh, one-time Polish Olympic ace, in 25.2 sec., two-tenths of a second under the championship mark set by Miss Walsh. Miss Lane also won the 100-m. title. Miss Walsh won individual high scoring honours with 28 points, winning the discus, broad jump, and second in the 200-m. Tuskegee (Ala.) institute won the team championship by scoring 112 points. (J. B. P.)

Trade Agreements.

One of the most significant developments in the commercial relations of the United States with foreign countries during 1941 was the signing on Oct. 14 at Buenos Aires of a reciprocal trade agreement with Argentina. While the purpose of this agreement, which became provisionally effective on Nov. 15, 1941, was to expand markets by modifying the tariff and other barriers restricting the flow of trade between the two countries, its full significance could not be regarded as limited to the expansion in trade which was expected to take place. Viewed in its broader aspect, it was an achievement of great importance, reflecting the untiring efforts of the United States government to implement its policy of inter-American economic co-operation and good neighbourliness.

Conclusion of a reciprocal trade agreement with Argentina in 1941 increased to 12 the number of other American republics with which such agreements were in effect. The twelve countries were Argentina, Brazil, Colombia, Costa Rica, Cuba (a supplementary trade agreement with Cuba was signed at Havana on Dec. 23, 1941, to become effective on Jan. 5, 1942), Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Venezuela.

By strengthening commercial relations between the other American republics and the United States, trade agreements contributed substantially to hemisphere solidarity, and additional agreements with those countries were in prospect. During 1941, negotiations with a view to concluding a trade agreement with Chile continued. On May 13, public notice of intention to negotiate an agreement with Uruguay was given, and a similar notice in regard to Peru was issued on Dec. 29, 1941. Meanwhile, one of a series of agreements reached on Nov. 19, 1941, by the governments of the United States and Mexico, as solutions to a number of problems of mutual interest, related to the decision of the two governments in principle to negotiate a reciprocal trade agreement. It was agreed that formal announcement of intention to negotiate the trade agreement should be made in due course, in accordance with the pertinent provisions of law.

In addition to the trade agreements in effect with other American republics in 1941, agreements had also been concluded, since the Trade Agreements act was passed in 1934, with the United Kingdom (including Newfoundland and the non-self-governing British colonies), Belgium, Canada, Czechoslovakia, Finland, France, the Netherlands, Sweden, Switzerland and Turkey. On Nov. 17, 1941, public notice of intention to negotiate a trade agreement with Iceland was given.

The trade-agreements program of the United States, as carried out by the agreements already concluded and those which might be entered into during and after World War II, was one of the most important means of assuring to all nations the greatest measure of economic freedom and access on equal terms to the raw materials and markets of the world. Adherence to this objective as a basis in part for postwar economic reconstruction was announced by the president of the United States and by Winston Churchill, the British prime minister, in the fourth point of the "Atlantic Charter" issued jointly by them on Aug. 14, 1941, following their historic meeting at sea.

Because of the influence of World War II it would be difficult if not impossible to measure statistically the effects of the trade-agreements program in 1941. However, the results of the program during the prewar period demonstrated its value as a means of restoring the foreign trade of the United States. As a result in large part of the concessions obtained from foreign governments in trade agreements on specified American export products, and of the general provisions of the agreements which constitute guarantees against discriminatory treatment of American trade, the tendency in prewar years was for U.S. exports to the trade-agreement group of countries to increase faster than U.S. exports to the nonagreement group.

Developments prior to World War II emphasized the fact that trade barriers and discriminations, as manifestations of economic nationalism, are among the underlying causes of war. Trade barriers, by impeding international commerce, caused diminished national incomes, depressed standards of living, increased unemployment, financial instability and social unrest. Trade discriminations lead to constantly shifting trade currents, commercial uncertainty and insecurity, recriminations and retaliations, trade conflict and international economic tensions.

The objectives of the trade-agreements program, as carried out under the act of June 12, 1934, were the reduction of excessive trade barriers and the elimination of trade discriminations. Since, in this way, the trade-agreements program counteracted the growth and spread of economic nationalism, the continued leadership of the United States in carrying out the principles and objectives of the program, both during and after World War II, was expected to be of vital importance to the re-establishment

and maintenance of a just peace. (*See* also INTERNATIONAL TRADE; TARIFFS.) (D. AN.)

Trade Unions: *see* LABOUR UNIONS.
Traffic Accidents: *see* ACCIDENTS.

Trailer Coaches. The trailer coach industry experienced what amounted to a boom during 1941. Several new manufacturers entered the field and many of the established manufacturers were forced to increase production facilities.

This was due, in a large part, to demand for defense housing. The United States government found that the trailer coach, sleeping four and completely equipped with heating, cooking and lighting arrangements, and priced far below any other method of housing, proved to be an ideal temporary and semipermanent home.

Manufacturers were not slow to improve insulation, interior arrangements, construction and other items entering into the building and production of these coaches. Shortage of some materials that were customarily used in production of trailer coaches made it necessary to use substitutes. In many instances, it was found that the substitute proved superior to the material formerly used.

In addition to the unpredictable demand for temporary housing, the United States government in 1941 used trailers for mobile field units, radio stations, officers' headquarters, photographic equipment and developing, field hospitals and many other purposes. It is estimated that 90% to 95% of the trailer coaches produced in 1941 was directly or indirectly used for defense purposes.

The government built a number of well equipped trailer parks for the exclusive use of defense workers, purchased trailers and rented them for a low rate to these people. Several hundred other excellent new parks were established during 1941 by private groups. (P. E.)

Trans-Jordan. Trans-Jordan lies to the east of Palestine, bounded on the north by Syria, on the northeast by Iraq, on the southeast and south by Saudi Arabia.

It is an Arab principality which, under a local Arab administration, forms part of the British-mandated territory of Palestine (*q.v.*). Like the land west of the Jordan, it is under the supervision of the British high commissioner for Palestine and Trans-Jordan, Sir Harold Alfred MacMichael, who is represented in Trans-Jordan by a British resident, Alec S. Kirkbride. The prince of Trans-Jordan is Emir Abdulla ibn Hussein; the prime minister is Tawfiq Abdul Huda. Area: 34,740 sq.mi.; pop. *c.* 350,000. Religion: Mohammedan, with about 30,000 native Christians. Capital, Amman, the ancient Rabbat Ammon. Chief cities: Amman (25,000), Es-Salt, Maan.

History.—During 1941 the country gained in political importance at the time of a pro-German government's rise to power in the neighbouring Arab kingdom of Iraq (*q.v.*). The regent of Iraq, a relative of the emir of Trans-Jordan, fled to Amman. It was of the greatest importance to the British that, partly because of the efforts of the emir of Trans-Jordan, the Arabic tribes remained loyal to their alliance with Great Britain and did not heed the call to revolt and holy war which emanated from the Baghdad radio at that time. It was from their bases in Trans-Jordan that British troops started for Iraq and finally succeeded in reinstalling the legal regent of Iraq and bringing the country back to its alliance with Great Britain. In reward for this important help, it was understood that promises were given to Emir Abdullah and to the Arabs for greater independence after the successful termination of World War II.

Education, Defense, Communication, Finance.—There were, in 1939, 191 schools with 13,854 pupils. Government contribution to education was £27,874. The defense forces of the country were organized in the Arab legion with 47 officers and 1,577 men in 1941. The Hejaz railroad runs through the country from north to south, and there are about 1,400 mi. of good motor roads. For 1939–40, revenue amounted to £513,971, expenditure to £510,293. Public debt amounted on Dec. 31, 1939 to £155,107. The value of the local currency is identical with British currency. The economy of the country is almost completely agricultural, partly still in a very primitive stage. (H. Ko.)

Transylvania: *see* HUNGARY; RUMANIA.

Trap-shooting. Of the several star performers among clay bird trapshooters during 1941, none shone as bright as Walter S. Beaver, of Conshohocken, Pa., in the number of victories in title events. Beaver, a leading shooter for nearly a decade, won the class AA crown in the national amateur singles and the class A doubles, the eastern states singles and doubles, high-gun honours in the New York state trapshooting championship, the Pennsylvania state championship, and tied with Joe Hiestand, eventual winner in a shoot-off, for the class AA target championship in the Grand National meet at Vandalia, Ohio. Numerous victories in feature shoots comprised his successes for the year, his best score being 199 out of a possible 200 in the eastern states meet in Stratford, Conn.

Even more important than Hiestand's victory was the crowning of Walter L. Tulburt as winner of the Grand American title for 1941.

M. F. Schwar, of Emmaus, Pa., who had been shooting clay birds for only two years, captured the high scratch prize (group 2 off 20 yards) at the Travers Island (N.Y.A.C.) traps in the three-day battle for the amateur championship of the U.S. in May, when Beaver won the group 1 title, at 25 yards, B. Higginson won the group 2 title at 22 yards, and W. Mekel won the group 4 event at 18 yards. In this title shoot, C. W. Phellis won the class A title, H. MacElrath the class B, J. Jannefelser the class C, Harry Hammer class D and N. Quinn, Jr., class E. Mrs. Mary Conde defended the women's title which she won in a shoot-off with Mrs. Van Marker.

By breaking 100 straight clay targets, A. S. Cornhill won the George H. Lyon Memorial trophy, the first important shoot of the 1940–41 season, over the Travers Island traps. (J. B. P.)

Treasury, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.
Trinidad: *see* WEST INDIES, BRITISH.
Tripoli: *see* ABRASIVES.
Trolley Buses: *see* ELECTRIC TRANSPORTATION.

Truck Farming. Vegetables grown for processing in 1941 in the United States exceeded by 24% the 1940 record crop and totalled an equivalent of 11,498,200 tons, the department of agriculture estimated. The 1940 crop was 10,765,100 tons. The acreage in 1941 was 1,590,770, compared with 1,379,000 ac. in 1940. In addition, vegetables grown for fresh market in 1941 amounted to 6,570,200 tons from 1,679,860 ac. (*See* MARKET GARDENING.) Unprecedented as was the volume of truck crop production in 1941, the secretary of agriculture announced in December a still larger program of production for 1942, calling for a pack of 44,000,000 cases of canned tomatoes, 38,000,000 cases of canned peas, 24,000,000 cases of canned corn and 12,500,000 cases of canned snap beans. This enormous increase was part of the lend-lease program of shipping food to Britain. The department of agriculture was to buy all U.S. grade C canned tomatoes offered through Dec. 31, 1942, at a base price of 95 cents per doz. for no. 2 cans, f.o.b. cannery; all Alaska and

sweets U.S. grade C canned peas offered through Oct. 31, 1942, at $1.10 per doz. for no. 2 cans, provided the respective canner had been certified by the agricultural department's state defense boards.

Table I.—*U.S. Production of Principal Vegetables for Processing, 1941 and 1940*

	1941	1940
Asparagus, California only	37,970 tons	53,880 tons
Beans, green lima	38,400 tons	26,140 tons
Beans, snap	126,420 tons	114,220 tons
Beets	106,700 tons	70,700 tons
Cabbage, for kraut	206,200 tons	185,200 tons
Corn, sweet	1,102,200 tons	731,500 tons
Cucumbers, for pickles	7,860,000 bu.	6,298,000 bu.
Peas, green	345,250 tons	307,120 tons
Pimentos	11,180 tons	13,020 tons
Spinach	34,800 tons	39,000 tons
Tomatoes	2,730,200 tons	2,275,800 tons

The U.S. department of agriculture began March 15, 1941, its expanded program of purchases of vegetables and other foods for shipment to Britain under provisions of the lend-lease act. While the bulk of these supplies was for export, a part was available to the Red Cross and other U.S. relief agencies.

Table II.—*Lend-Lease Purchases of Vegetables by the U.S., March 15–Dec. 1, 1941*

Commodity	Quantity	F.O.B. Cost
Canned tomatoes	5,343,143 cases	$9,002,035
Canned tomato paste	69,675 cases	246,328
Canned tomato purée	43,000 cases	81,500
Canned potatoes	581,400 cases	1,164,219
Canned peas	218,919 cases	475,709
Canned carrots	20,000 cases	27,750
Canned beets	14,500 cases	20,750
Canned green beans	11,866 cases	22,420
Canned celery	1,250 cases	4,500
Canned spinach	1,250 cases	3,188
Dry beans	190,075,900 lb.	8,416,415
Dried peas	21,271,100 lb.	882,496
Carrots	114,464 bu.	56,662
Onions	18,500 sacks (50 lb.)	9,250
Onions, dehydrated	319,000 lb.	133,810
Potatoes, white	2,292,758 bu.	1,082,181
Cabbage	155,016 bu.	44,854
Beets, fresh	97,404 bu.	50,613
Snap beans	3,021 bu.	1,964
Peas, fresh	82,465 bu.	76,692
Tomatoes, fresh	46,887 bu.	34,075
Corn, fresh	33,594 bu.	14,417
Celery	72,952 stalks	1,459
Cauliflower	2,400 crates	1,320

(S. O. R.)

Trucks: *see* MOTOR TRANSPORTATION; MOTOR VEHICLES.

Tuberculosis. **Diagnosis.**—*Tuberculin Test.*—The Tuberculosis committee of the American Student Health association reported in April 1941 that for the academic year 1939–40 there were 248 colleges and universities with some form of tuberculosis control program. In 1932–33 there were only 12 and in 1938–39 only 165 such institutions. The enrolment in the 248 schools with some program in 1941 was 680,201. The committee agreed that tuberculin testing is a prime prerequisite to any other items in a tuberculosis case-finding program. It recommended that tuberculin be administered by the intradermal method of Mantoux. Among the 248 with a tuberculosis program, 213 employed the tuberculin test, which was administered to 123,389 students, of whom 25.4% reacted. This is in contrast to 14,318 tested in 1932–33, when 35% reacted. A decrease in the incidence of reactors had been observed each year since the work began. In 1939–40, 637 new cases of tuberculosis were detected among the students and 39 others who were not students. There were also 338 old cases; these students had been treated and were back in school.

The testing of cattle with tuberculin was continued throughout the nation despite the fact that every county in the United States had been classified as a modified accredited area. In 1940, of 12,222,318 cattle tested, only 0.46% reacted. This brought the grand total of tuberculin tests of cattle in the United States since 1917 to 229,714,023. During this time 3,768,201 reactors had been removed from the herds of the United States. There is no nation in the world whose cattle herds are so little affected with tuberculosis and whose citizens are so free from the bovine type of tuberculosis as the United States. Feldman called attention to the fact that cattle may become tuberculin reactors through association with humans who have contagious tuberculosis. He reported a case of human tuberculosis in an adult bovine.

X-ray.—Much interest was manifested throughout the year in the various methods of making X-ray inspections of the chest. Miniature films were tried in several places. Douglas *et al.* concluded that they were of value in the examination of large groups of individuals. Edwards reported on the use of regular size paper film in the examination of about 750,000 persons and declared them entirely satisfactory.

Further work was reported by Farness, Olson *et al.* to show that evidence of calcium deposits in the lung as seen on X-ray films should not be assumed to be due to tuberculosis unless better proof is available.

Observations on Special Groups.—Tice reported the results of tuberculin tests with X-ray films of the reactors in a large number of Chicago school children. He confirmed the findings of so many previous workers that among school age children chronic pulmonary tuberculosis is rare.

Alt *et al.* reported on tuberculosis among medical students at the Northwestern university medical school. The factors which they considered to be of importance in the development of this disease among students were exposure to patients, cross infection among students and overwork. Israel *et al.* reported an alarming tuberculosis situation among students of nursing in a Philadelphia hospital.

Pollak *et al.* found tuberculosis a problem of the first order in the Peoria state hospital for the mentally ill. Hilleboe *et al.* examined 1,264 mentally ill patients and found 158 with minimal, 74 with moderately advanced and 14 with far advanced tuberculosis. On the basis of further work they were of the opinion that in the state where they worked there were 1,400 cases of tuberculosis among the patients institutionalized for mental illness. Altshuler and Bailey examined 4,477 inmates of the Eloise, Mich. hospital and found 276 cases of tuberculosis. Among the 1,200 employees 42 cases were found. They advised that mentally ill patients with tuberculosis be treated by strict isolation methods.

Bogen *et al.* called attention to the fact that workers caring for patients with tuberculosis could only be shielded from exposure to such infection by conscious and conscientious precautions. He found that by the use of relatively simple measures the air and dust in the general vicinity of tuberculous patients "may be kept free from these dangerous germs."

Treatment.—Much interest was manifested in the drainage of cavities in tubercular lungs. The cavity is entered through the chest wall and suction is employed. Although much credit has been given Monaldi for this work, the procedure was practised by Eloesser of California in 1936.

Drug treatment in tuberculosis had been almost abandoned until Feldman and Hinshaw found that sodium p,p'-diaminodiphenylsulphone-N,N'-didextrose sulphonate, known under the trade name of Promin, a sulphonamide derivative, is effective in controlling experimental tuberculosis in guinea pigs. They inoculated each of a group of animals with a lethal dose of tubercle bacilli of the human type. These animals were then divided into two groups, the first of which received no Promin; the second group was subdivided into groups which had Promin treatment begun at different intervals after inoculation with tubercle bacilli. The drug was mixed with the animals' food. All of the animals which did not receive Promin developed widespread disease and died. In none of the treated animals did widespread disease develop and none died of tuberculosis. Indeed, in 60% of the animals no visible lesions could be found at postmortem examination in any part of the body, and in the remainder small, atypical and apparently insignificant lesions were found. This was the first time in history that a drug had been found to control tuberculosis in animals.

Effects of War on Tuberculosis.—Dr. Kendall Emerson, managing director of the National Tuberculosis association, reported that in England and Vichy France tuberculosis was definitely increasing and that in at least one of the lowland countries it had reached almost epidemic proportions. This is what happened in some nations during World War I. It is due largely to the fact that numerous persons with contagious tuberculosis kept in isolation in times of peace were required to give service during war, such as caring for children and other light work, which brought them in contact with large numbers of persons to whom they spread their disease. Others who already had tuberculosis well controlled were in danger of its becoming activated.

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Tung Oil: *see* VEGETABLE OILS AND ANIMAL FATS.

Tungsten. World production of tungsten concentrates was estimated at 44,600 metric tons (60% WO_3 basis) in 1940, against 38,000 tons in 1939, with China, Burma, Portugal, United States and Bolivia as the leading producers, supplying more than 80% of the total. United States production increased from 4,287 short tons of concentrates in 1939 to 5,319 tons in 1940. Imports for consumption in the United States in 1940 were 5,415 tons, with a tungsten content of 2,805 tons; general imports were 9,241 tons, with a tungsten content of 4,833 tons, 46% from China, 20% from Bolivia, 10% from Argentina, 6% each from Portugal and Australia and 4% from Peru. The difference between general imports and imports for consumption added 2,028 tons of tungsten content to the stocks in bonded warehouses. Imports in bond for smelting and re-export had a tungsten content of 674 tons. Imports for consumption increased heavily in 1941. the total for the first three-quarters being 8,500 tons, with a tungsten content of 4,441 tons, of which 52% was from China, 28% from Bolivia, and 36% from South America. Chinese shipments held up remarkably well, considering the handicap of transportation over the Burma road. Renewed efforts on the part of Japan to cut the Burma road, and added difficulties of ocean transportation with Japan actively engaged in war with the United States, were new handicaps to be met, and it was quite possible that shipments might be cut off.

Fortunately shipments were increasing from South America (1,611 tons of tungsten content in three-quarters of 1941, against 1,073 tons in all of 1940). Increases that might have been built up from other countries were offset by decreases elsewhere, and it was largely from South America that future increases were to be expected, since practically the entire output of the continent had been contracted for, and shipments from that direction were less subject to interruption. Government loans in considerable amount were made to China, payment to be made in tungsten, but of course receipt of these payments was subject to the hazards of transportation conditions, and it was to be assumed that Japan would make these as unfavourable as possible. (*See* also MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. Ro.)

Tunis: *see* FRENCH COLONIAL EMPIRE.

Tunnels. The year 1941 saw much less activity in tunnelling than in previous years. This was no doubt due to economic conditions brought about by World War II.

It seems highly fitting to record here, for reasons to be stated, the death (Dec. 17, 1940) in London of the inventor of the hooded shield, Sir Harley H. Dalrymple-Hay, news of which was received in Feb. 1941. In shield tunnelling in dangerous ground it was customary to timber ahead length by length with the tunnel lining rings, almost to the extent of building a timber tunnel to receive the shield. The invention of extending the upper two-thirds of the shield as a cantilever or "hood," and of course as part of the shield structure, brought about the complete elimination of all such timbering in advance of the shield, a great saving in the loss of compressed air in the tunnel workings, with much added safety to the miners in setting forward timber breasting wholly under protection of this extension. The first use of this form of shield in Great Britain was in the construction of the Baker street and Waterloo railway under the Thames in 1901 and its first use in the United States was in New York under Morton street of the Hudson and Manhattan railroad in 1905. There was little opportunity for the use of this shield in Great Britain, but in New York it was used to great advantage and in ways that its inventor would not have dreamt of, enabling tunnels to be built in bad ground in the vicinity of and below the elevation of foundations of heavy buildings, even obviating underpinning. It brought about great economy and safety in construction of tube tunnels at a speed two- and threefold what had hitherto been possible with a shield having its face on one plane.

On the Delaware aqueduct tunnels of New York city an 85-mi. stretch was completed with the exception of a short length at the upper end. Concrete lining, on which extraordinary progress had been made, was also near completion.

Brooklyn-Battery Tunnel.—The largest tunnel work started during the year was the Brooklyn-Battery tunnel in New York city, extending from the Battery by way of Governor's Island to Hamilton avenue, Brooklyn. This is a 2-tube highway tunnel of about one mile in length. It will be partly in rock and partly in bad ground of the glacial drift, in the proportion of about 5 to 1 respectively. The external diameter of these tunnels of cast iron lining is 31 ft. 6 in., with a 21-ft. roadway.

Chicago Subway.—In Chicago the initial program of the subway system to the extent of 8.5 mi. was completed during the year. As part of this system two sections in the Chicago loop give station accommodation under Dearborn street and State street of great length (3,886 ft. and 6,145 ft. respectively). These station lengths consist of two shield-driven tunnels converted by mining into one great structure having a centre or island platform. Elsewhere tunnelling was done by hand mining and all work was done with the aid of compressed air.

Carleton Tunnel.—To drain the deep workings of the world famous gold mines at Cripple Creek, Colo., the so-called Carleton tunnel, 8 by 11 feet for a length of six miles, was completed after much trouble with a heavy flow of water which ran as high as 20,000 gal. per minute. After this flow had subsided, conditions revealed that it was desirable to by-pass this bad area and continue the tunnel on a new alignment. About Aug. 1 the contact zone between Pikes Peak granite, through which the tunnel had been driven, and the gravel-filled crater in which the mines lie—the goal of this bold scheme—was achieved. Work was in progress in driving laterals and raises to drain the various mines in this crater area. The speed of driving this tunnel, which of course is unlined and unfinished, was very high and averaged about 50 ft. per day.

Continental Divide Tunnel.—The United States bureau of reclamation continued to construct a very large tunnel project in Colorado called the Continental Divide tunnel, as part of the Colorado-Big Thompson Irrigation and Power project. The tunnel will have a finished diameter of 9 ft. inside concrete lining, being a rock excavation of more than 12 ft. in diameter. The stretch of tunnel driven from the west portal encountered much bad ground in passage through a fault. At the east end better conditions prevailed and the extraordinary progress of 65 ft. per day was being maintained. By Jan. 1, 1942 this heading had progressed about 20,000 ft. Much attention was paid to ventilation and additional efficiency was added on this long heading by the installation of a track signal system for the operation of trains. The tunnel as a whole will be 13 mi. long.

Duchesne Tunnel.—The bureau of reclamation also started the construction of the Duchesne tunnel near Kamas, Utah, as part of the Provo-Irrigation system; it will be 10½ ft. in diameter and 6 mi. long.

Highway Tunnel.—Under the Mobile river at Mobile, Ala., the sunken Highway tunnel, 3,450 ft. long, was opened to traffic on Feb. 20. This tunnel of steel and reinforced concrete was built in sections on dry land floated into position over a prepared trench dredged to receive them and sunk into position. It accommodates a roadway 21 ft. wide for traffic in each direction.

London.—In London during the period of air raids the extensive system of deep underground railways was no longer being extended. However, certain short lengths of projected links of the system were being driven as air raid shelters from about 20 shafts. It was reported these would provide for the shelter of about 90,000 people. (J. Fe.)

Turkestan, Chinese: *see* SIN KIANG.

Turkey. A republic in southeastern Europe and western Asia. Area 296,500 sq.mi.; pop. (Oct. 20, 1940) 17,869,901. Capital, Ankara. Chief cities: Istanbul (789,346);

BRITISH GEN. SIR JAMES H. MARSHALL-CORNWALL reviewing Turkish troops in Jan. 1941, as Hitler's threat to the Balkans drew the two nations closer

Smyrna (184,362); Ankara (155,544); Adana (89,990); Brusa (77,348); Eski-Shehr (60,614); Gazi Antep (57,314). Religion: Mohammedan. President, General Ismet Inönü; premier, Refik Saydam.

History.—During 1941 Turkey maintained its nonbelligerent attitude, but with the growth of German power in the Balkans and especially with German aggression against the soviet union, Turkey moved from its previous position as a nonbelligerent ally of Great Britain to a more and more outspoken neutrality, but did not resist German encroachments upon what had been previously and frequently claimed as Turkey's vital defense zone. On the contrary, Turkey facilitated Germany's occupation of Bulgaria and its invasion of the soviet union by two preceding diplomatic moves which assured Germany of Turkey's complete neutrality. Nevertheless Turkey declared until the end of 1941 that it remained faithful to its alliance with Great Britain and that it would defend its territory against any invasion. Turkey did not neglect to continue its fortifications and troop concentrations in Thrace so as to be prepared for any eventuality, but it refused to use its armed forces to form any united stand with Yugoslavia and Greece against the German domination over the Balkans, in spite of repeated declarations which could have been interpreted in that sense.

In Jan. 1941 Anglo-Turkish talks between general staff officers were held in Ankara, and authoritative editorials declared that not only would Turkey defend its frontiers, but that it regarded Bulgaria and Greece as within its security zone and hence could not remain indifferent to any move against them. But the Turkish-Bulgarian accord which was signed on Feb. 17, pledging mutual nonaggression, was the first clear sign that Turkey might yield and that it might remain immobile in case of a German invasion of Bulgaria. Nevertheless, the Turkish press continued to express its strong sympathy for Great Britain and for the Greeks who were then fighting against Italy. At the end of February the British foreign secretary, Anthony Eden (*q.v.*), arrived in Turkey accompanied by Gen. Sir John Dill, chief of Britain's imperial general staff, and received a very warm welcome. It was officially announced that Britain and Turkey had reached "full agreement on all points" concerning the Balkans and the eastern Mediterranean.

At the beginning of March a personal message from Chancellor Hitler to the Turkish president was brought to Ankara, without, however, producing any immediate effect. The German ambassador Franz von Papen worked very hard to draw the Turks closer to Germany. The results of his efforts began to show after Germany's successful occupation of Greece and Yugoslavia. On March 24 Turkey and the soviet union exchanged declarations, according to which the soviet union promised Turkey complete neutrality, based upon the nonaggression pact of 1925, in case of Turkey's defense of its territory against aggression. Of much greater importance was the surprising German-Turkish friendship treaty which was signed in Ankara on June 18. The two countries bound themselves to respect each other's territories, to take no measures aimed directly or indirectly against the other contracting party, and to consult on all questions affecting their common interest. Even more important was the simultaneous declaration according to which the radio and the press of both countries were to act in a spirit of friendship and mutual confidence, which would thus put an automatic end to all anti-nazi propaganda in Turkey. Closer economic cooperation between the two countries was also announced. In spite of the fact that the Turkish foreign minister Shukru Saracoglu declared that the new pact maintained Britain's former treaty with Turkey intact, the Turkish press and radio proclaimed their complete neutrality, the Germans began a new trade drive for the purpose of obtaining chrome, copper and other ores, which so far had been shipped to Great Britain, and the pact served Germany in its plans for an invasion of the soviet union a few days later. On Aug. 12 Great Britain and the soviet union gave Turkey formal assurances that neither had aggressive intentions against the Dardanelles or Turkish territory, assurances made necessary by the German "nerve war" which tried to insinuate that similar intentions existed.

Meanwhile British-German competition for Turkish trade grew more bitter. Dr. Kurt Clodius visited Turkey in an effort to get all Turkish exports. Finally Turkey agreed to deliver chromium to Germany in 1943, after the expiration of the agreement which existed in 1941 with Britain; in exchange Germany was to begin immediate delivery of war materials to Turkey to an amount of not less than 80,000,000 lire before the end of 1943. At the same time two Turkish generals, one the director of the Turkish mili-

tary academy and one a columnist on military affairs, accepted Chancellor Hitler's invitation to visit the German-Russian front.

On the other hand, Turkey celebrated on Oct. 29 the 18th anniversary of the republic with a mighty display of its military power. Confidence in the Turkish attitude was expressed in the fact that the United States had decided to give Turkey full lend-lease aid. The Turks registered their appreciation of the move, but by the end of 1941 the Turkish attitude remained as undetermined as it had been during the year. With the outbreak of war between the United States and Germany, Japan and Italy, Turkey hastened to declare its complete neutrality.

Education and Defense.—The number of elementary schools in Turkey in 1939 was 7,862, with 547,122 boy and 266,410 girl students; there were 290 secondary schools of all kinds, with 86,787 male and 33,744 female students, and 17 institutions of higher learning, with 8,557 male and 1,833 female students. Total expenditure on education amounted to £T.29,785,240. The army is based on compulsory service for all men between 20 and 46. Its strength is about 20,000 officers and 175,000 men in peacetime. The Turkish navy is small and consists largely of older ships. In 1940 the air force was estimated at 370 first-line aircraft. Later information on the strength of the army, navy and air force was a military secret. The budget estimates for 1940 amounted to £T.93,977,000 for the army, £T.6,979,000 for the navy and £T.78,294,000 for the air force.

Finance, Trade, Communication.—The Turkish monetary unit is the Turkish pound (=76.46 cents U.S., Sept. 1941), divided into 100 piastres. The estimated revenue and expenditure for 1940–41 amounted to £T.268,481,000 and £T.268,476,321, respectively. The grand total of the public debt amounted on May 31, 1939 to £T.619,385,681. Imports for 1939 amounted to £T.118,248,934, exports to £T.127,388,997, of which the largest part went to Germany, the United States, Italy and Great Britain. The principal articles of import were cotton piece goods, iron and steel manufactures machinery, mineral oils and cotton and woollen yarns, while the principal exports consisted of tobacco, hazelnuts, mohair, chrome, figs, opium and cotton. The exports in 1940 amounted to £T.111,629,000, while the imports had shrunk to £T.68,923,000. It is interesting to note that during 1940 Great Britain surpassed Germany, as regards both exports and imports, but was surpassed by Italy, which had taken the lead during the first months of 1940. Turkey had 4,574 mi. of railroads and 5,987 mi. of good roads in 1941. No foreign planes pass over Turkey.

Agriculture and Industry.—Chief agricultural products are cereals, tobacco and cotton; among livestock there were 25,299,730 sheep, 11,185,457 ordinary and 5,236,691 mohair goats in 1941. Hazelnuts, figs, raisins and olive oil are also important products for export. The industrialization of Turkey has made considerable progress, especially in textiles and in paper, glass, sugar and cement industries. Turkey is rich in minerals, especially coal, of which 2,696,397 metric tons were mined in 1939, chrome, with an output of 183,539 tons, borax, zinc ore, emery, copper and lead.

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TVA: *see* TENNESSEE VALLEY AUTHORITY.

U-Boats: *see* SUBMARINE WARFARE.

Udet, Ernst (1896–1941), German flier, was born April 26 in Elberfeld, Germany. As a lad he was fascinated by aviation and constructed model planes and gliders. He joined the German air force in 1914, fought with the Richthofen squadron on the western front, and was credited with shooting down 62 Allied planes during the war. After World War I, he became a stunt flier and thrilled crowds in Europe and the United States with his daring and skill. In 1937 he successfully landed his plane on the superstructure of the zeppelin "Hindenburg" while it was in flight. When the nazis came to power, Udet was made head of the technical division of the new air force, and in 1940 he was appointed general of aviation by Hitler. Udet played a vital role in building up the *Luftwaffe* into one of the world's most formidable air forces, and he urged the adoption of parachute troops and gliders. A Berlin dispatch said Gen. Udet died Nov. 17 in an accident "while experimenting with a new weapon."

Uganda: *see* BRITISH EAST AFRICA.

Ulster: *see* IRELAND, NORTHERN.

Ultrasonics: *see* METALLURGY.

Unemployment. Unemployment fell to the lowest levels in 1941 since 1929. This was the characteristic picture in the various nations, although various localities and industries in many of the nations did not exhibit the expansion of employment typical of the general situation. The steady spread of war and the increased significance of industrial production of almost all kinds in the "total war" beginning in 1939 resulted in an increasing tempo of economic activity throughout 1940–41.

The writer has less confidence than formerly in the employment statistics of many nations. War diverts attention and funds from such activities as gathering statistics. Probably the general picture derived from the data reported by the nations to the International Labour Office is correct but one would not be justified in basing precise calculations and comparisons upon the available data. The published figures are of two principal kinds, each gathered in several different ways: statistics of employment; *i.e.*, of the number of people at work, and statistics of the number of people in need of work. Employment statistics are derived from "establishment" reports collected by mail or through field agents or labour inspectors. Unemployment statistics are furnished by the employment exchanges (applications for work), unemployment insurance systems (applications for benefits), unemployment relief records, reports of trade union secretaries and censuses of unemployment.

The various types of statistics agree reasonably well in their picture of what happened in the different countries, but not always upon the extent of the changes which occurred.

Great Britain and Northern Ireland have three-fourths or more of their wage earners (about 15,000,000) under unemployment insurance. These constitute about 90% of the British labour supply. In 1939 the employment exchange statistics showed an average of 1,513,560 wholly or temporarily out of work. In 1940 the average number was 963,536 and then gradually declined to 270,289 by Aug. 1941. If the 4,750,000 not covered by the insurance act were included in the figures, the unemployment percentage would be more apt to fall than to increase, since military service, the police, civil service, teaching and other relatively stable occupations were in this group.

Registrations of unemployed persons at the employment offices of Eire increased fivefold from the pre-depression years to 1935. There was an average of 119,148 unemployed persons registered in 1935. The registration averaged 84,054 in 1940 and 106,000 in Jan.–Feb. 1941, and 58,000 in Aug. 1941. That was high unemployment for Ireland in 1941 and reflects the adverse effect of the war upon that country.

Unemployment remained at high levels in France from 1935 to Oct. 1940. In Oct. 1940 there were nearly twice as many unemployed receiving relief (750,000) as the average for the preceding ten years. The average number of applicants for work at the employment offices was 404,604 in 1939. The figure was 1,059,000 in Oct. 1940. It dropped gradually to July 1941, when the "provisional figure" was 310,000. The figures for 1941 are of doubtful accuracy.

High unemployment figures obtained in the Netherlands from 1933 continued until March 1939. The winter of 1938–39 was very bad. From April improvement was rapid. There were 405,927 registered at the employment exchanges in Jan. 1939 and 297,874 in Jan. 1940, then the registrations fell steadily to a low of 107,000 in May 1941. The percentage of insured workers drawing unemployment insurance benefits averaged 21·8% in 1939. In 1940 it approximated 18%, in Jan. and Feb. 1941, rose to 27·6% and 24·9% respectively, then dropped to 16·5% by April. Belgium experienced marked improvement in 1937, but with worse conditions in 1938. The average number unemployed increased from 125,929 in 1937 to 203,000 in 1938; then dropped to 173,000 in 1939 and 151,000 in 1940. Unemployment was much worse from Oct. 1940 through Feb. 1941 (more than 200,000); then declined to a low of 98,000 in July 1941. In 1937 the insured workers of Belgium lost 13·1% of their possible working time; in 1938, 17·6%; in 1939, 18·8%; in 1940, 18·5%. Figures for 1941 are not available.

Denmark, Norway and Sweden all experienced moderate improvement

during the first eight months of 1939 following slightly worse unemployment in 1938 than in 1937. Denmark's percentage of trade unionists unemployed was 21.4% for 1938 and 18.4% for 1939. It was 23.9% in 1940; approximated 35%, Dec. 1940–Feb. 1941; 26.8% in March 1941; then dropped rapidly to 4.6% in June 1941 and stood at 6.0% in Aug. 1941. Obviously, providing Germany with war supplies was benefiting Denmark. Norway's in 1938 was 22%; in 1939, 18.3% and in 1940, 23.1% and in the first quarter of 1941 averaged 17.6%. Sweden's percentage of unemployed union workers in 1938 was 11.8%; in 1939, 10.0% and in 1940, 12.2%. In 1941 the percentage started at 17.2% in Jan. and dropped gradually to 9.2% in June.

The German figures are of questionable value, partly because of changes in the bases of computation, partly because of the war situation and its effects upon their statistics. The average number of applicants at employment exchanges dropped from 912,312 in 1937 to an average of 429,461 in 1939. No 1940 or 1941 figures were available. Unemployment probably stood at the lowest figures in German history. Unemployment is not permitted.

Switzerland's employment exchange figures are unusually reliable measures of unemployment because both the relief act of 1919 and the unemployment insurance law require applicants to register at the employment exchanges. From 1927 to 1929, 2.2% of the employable population were wholly unemployed and 1.6% partially. For practical purposes, this is zero unemployment in any country. In 1929 an average of 8,131 applicants registered at the employment offices (out of about 2,000,000 employables). In 1939 the average was 40,324. In 1940 it was 16,374 and in 1941, starting with a winter seasonal figure of 22,853, dropped sharply in March to 9,514 and then fluctuated from 5,000 to 8,000 through Aug. 1941. These figures represent absolute minimums for unemployment—from 1.4% to 1.6% of the insured employable population.

The Italian index of employment (1929=100) was down to 78.5 in 1932 and back to 94.9 in 1936, 104.5 in 1937, 110.7 in 1938 and 113.3 in 1939. Statistics for Italy for 1940 and 1941 were not available.

Czechoslovakia had very low unemployment in 1939. Their employment office average registrations dropped from 335,518 in 1938 to 44,080 in 1939. No figures were available after that date.

Finland publishes only employment exchange statistics. Their registrations reached a peak of 17,351 in 1933. For 1939 they averaged 3,300; 1940, 4,121; and in 1941 ranged from 5,000 to 6,200 from January to May.

Yugoslavian employment exchange statistics record an average of 22,517 registrants for work in 1938; 24,223 in 1939 and 26,724 in 1940. In Jan. 1941 the figure was 49,073 and in Feb. 46,092.

The only Mexican figures on unemployment are "official estimates." The figure given for 1930 was 75,695; 1932, 339,378; 1938, 209,332; 1939, 198,593; 1940, 183,246; and the figures for the first four months of 1941 ranged from 181,813 to 197,000.

The general trend of employment in the United States and Canada was downward in the first half of 1938, with severe unemployment, particularly in the United States, until the spring of 1939. There was then steady improvement the balance of the year.

The Canadian employment index (1929=100) averaged 93.9 for 1938; 95.7 for 1939 and 104.4 for 1940. In Jan. 1941 it was 113.6 and rose steadily to 136.7 in Aug. 1941. The employment exchanges carried average registrations of 103,739 during 1939 and 100,417 in 1940. From then the registrations decreased steadily to 42,653 in July 1941.

The United States took a special census of unemployment, Nov. 20, 1937, which recorded 7,822,912 as unemployed (2,001,877 of whom were employed on government relief work). This census was a voluntary report of individual citizens on forms left at all homes by the postal service. Sample tests made on 1,455 mail routes indicated that a 100% return might have shown as many as 10,800,000 idle on Nov. 20. A half million workers were laid off in Nov.-Dec. 1937. Comparing these figures with the 13,500,000 to 14,500,000 idle in 1932–33, the 1937 unemployment figure was discouragingly large. But in 1939–41 the trend of unemployment was continuingly downward and by the end of 1941 approximated 3,500,000.

Previous to 1930 the United States economic system expanded each decade rapidly enough to absorb the growth of population. During the '30s economic growth failed to keep pace with the growth of labour supply. The unemployment of 1937 was in considerable measure due to this factor. The expansion of 1939–41 practically absorbed the growth in labour supply of the 1930s. If large numbers became unemployed in some subsequent year it would be because of other factors than retarded economic development.

The factory employment index of the U.S. stood in the census month (Nov. 1937) at 101.1 (1923–25 base). A year later it was 90.5 and from Jan. to Aug. 1939 ranged between 92.3 and 96.3. The low point for the '30s was in 1932, 66.3. The index rose rapidly after July 1940, and in Jan. 1941 stood at 115.4 (*see* Table) from which figure it rose steadily and rapidly to 135.3 in Oct. The rise in employment continued throughout the balance of the year but the later figures were not available.

Pay rolls always fluctuate more violently than employment because of overtime and part-time work. The monthly average of pay rolls (1923–25=100) was 110.4 in 1929; but 46.7 in 1932; 85.6 in 1936; 102.0 in 1937; 77.5 in 1938; 90.8 in 1939 and 105.4 in 1940. Starting at 120.7 in Jan. 1941, the index rose to 166.6 by Oct. The more rapid rise of the pay roll than of the employment index in 1941 was due in part to increases in wage rates and in part to the large amount of overtime paid for at time and a half and double time.

While employment exchange statistics are available for the U.S., the figures have been so profoundly influenced by relief, public works and other governmental policies that they cannot be used in comparisons with other nations. It should be noted that the 4,699,020 persons registered at U.S. public employment offices in Aug. 1941 included a considerable number of people who had jobs. It is not an unemployment figure.

Japan was one of the nations with high employment in 1937, a by-product, of course, of war. The employment index (1929=100) was 123.8 in 1937 and 131.2 in 1938. In 1939 it rose to 135.9. The government's official estimates of unemployment in 1932 estimated that but 6.8% of their employable population was idle, a figure hard to reconcile with an employment index of 82 that year. For 1938 their unemployment estimate was 237,371. The estimates were about 60,000 lower during 1939 than for the corresponding months of 1937. Japanese unemployment was low, 1937–39. No figures were available for 1940 or 1941.

New Zealand's are entirely employment exchange figures. They indicate a gradual improvement in employment after 1934, with 1937–38 distinctly better than any year since 1933. The numbers registered ranged between 1,000 and 9,000, Jan. to Dec. 1939. In 1941 they ranged from 1,924 to 2,626 per month.

The only unemployment figures for Australia are compiled from reports sent in by union secretaries—a not very satisfactory type of unemployment statistics. The Australian trade union returns showed 45,775 or 9.7% of the union workers unemployed (monthly average) in 1939; 39,116, or 8% in 1940; 27,289, 5.3% in Feb. 1941 and 3.6% in May 1941. No absolute figures were published after Feb. 1941. But unemployment in Australia was at a low figure throughout 1941, as the country was geared to wartime production efforts.

The employment exchange registrations in Chile jumped from an average of 29,345 in 1931 to 107,295 in 1932, and then gradually dropped to 30,055 in 1934. Since then, applications for work have been at low levels. Registrations averaged only 10,672 per month in 1935; 6,474 in 1936; 3,215 in 1937; 4,578 in 1938; 9,415 in 1939; 8,550 in 1940, and declined gradually in 1941 from 5,207 in January to 2,991 in April and up to 4,410 in August. (*See* also CENSUS, 1940: *Employment Figures;* SOCIAL SECURITY; UNITED STATES; WAGES AND HOURS.) (D. D. L.)

Unemployment Insurance: *see* SOCIAL SECURITY.

Unfederated Malay States.

One of the three principal subdivisions of British Malaya (*See* also STRAITS SETTLEMENTS and FEDERATED MALAY STATES). Area, 24,728 sq.mi.; pop. (1931) 1,600,895. There are five states on the Malay peninsula and Brunei, on the island of Borneo. These principalities are ruled by native sultans who have treaty relations with the British crown under which British advisers are appointed for the general supervision of administration. The largest, most populous and relatively advanced of the states is Johore, at the southern end of the Malay peninsula, opposite Singapore (*q.v.*). The area and population of the land states in 1939 were as follows: Johore, 7,330 sq.mi., pop. 778,990; Kedah, 3,660 sq.mi., pop. 484,933; Kelantan, 5,750 sq.mi.; pop. 393,983; Trengganu, 5,050 sq.mi., pop. 204,543; Perlis, 310 sq.mi., pop. 56,382. The population consists predominantly of Malays, except in Johore, where the Chinese outnumber the Malays. After rubber the most important products are rice and coconuts. Several of the states in northern Malaya, Kedah, Perlis and Kelantan,

General Indexes of Factory Employment and Pay Rolls U.S.A.

Source: *Monthly Labor Review*
(1923–25=100)

Employment

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1929	101.7	104.1	105.4	106.7	106.5	106.8	107.3	109.2	110.3	109.0	104.6	100.7	106.0
1932	70.0	71.2	70.1	67.8	65.2	63.2	61.0	62.7	66.1	67.2	66.3	65.1	66.3
1936	92.1	92.2	93.4	94.7	95.4	95.9	97.1	99.0	101.9	103.2	103.3	104.4	97.8
1937	102.7	105.3	107.7	108.8	108.9	107.5	108.0	109.1	109.0	107.2	101.1	94.5	105.8
1938	87.8	88.2	87.7	85.7	83.4	81.6	81.9	85.7	88.8	88.5	90.5	91.2	86.8
1939	92.3	93.6	94.3	94.1	93.0	93.4	93.5	96.3	100.3	103.7	103.9	104.2	96.9
1940	101.5	101.5	100.9	99.7	99.1	99.6	99.7	103.8	107.7	113.8	114.7	116.2	104.9
1941	115.4	117.8	119.9	122.6	124.9	127.9	130.7	133.0	135.2	135.3	..	..	..

Pay Rolls

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1929	103.8	110.8	113.0	114.1	114.3	112.7	108.6	113.5	114.4	113.7	104.9	101.2	110.4
1932	54.0	55.4	53.6	49.6	46.8	43.7	40.4	41.4	44.0	45.8	43.6	42.4	46.7
1936	76.7	76.6	80.3	82.3	83.9	84.1	83.4	87.1	86.9	92.5	94.0	98.8	85.6
1937	94.4	99.7	105.5	109.3	109.7	107.0	104.6	108.2	104.4	104.5	92.9	84.2	102.0
1938	75.0	76.9	77.1	74.6	72.9	70.8	70.6	76.8	81.0	84.1	84.1	86.6	77.5
1939	83.7	86.0	87.6	85.5	85.0	86.5	84.4	89.8	93.0	101.7	101.7	103.9	90.8
1940	98.4	97.9	98.4	96.5	96.4	98.1	96.8	104.0	110.1	116.2	116.4	122.4	105.4
1941	120.7	126.8	131.2	134.7	144.1	152.2	152.7	158.3	163.0	166.6	..	..	..

were occupied by the Japanese in Dec. 1941. (*See* also JAPAN; WORLD WAR II.) (W. H. CH.)

Union Now. *Union Now* is the name of a book by Clarence K. Streit which proposed that a nucleus of the more experienced democracies form a federal union designed to grow gradually into a World United States. First published in New York in March 1939, it aroused discussion in many countries and immediately gave rise to an organized movement known as Federal Union, Inc. This nonprofit membership association with national headquarters at 10 East 40th street, New York city, is also popularly called "Union Now."

The two words of the title express the book's two major contributions to the problem of organizing world government: *Union:* World government, to be effective, should be organized with man instead of the nation as its supreme unit; it should constitute an interstate government of, by and for the people instead of a government of, by and for the states members, a federal union modelled on the U.S. constitution rather than a league as exemplified by the Geneva covenant. The union should have power in five main fields—citizenship, foreign relations and defense, interstate trade, money, postal and other interstate communications. All other powers should remain with the nation members to exercise independently.

Now: This union, far from being a Utopian project for the distant future, must be started at once in order to prevent the lack of effective democratic world government resulting in another world war. To get this end, the president of the United States should lead in getting the union started as a nucleus powerful enough to keep the peace from the outset and designed to grow gradually into a universal government by the admission of outside states and colonial peoples as states are admitted to the U.S.A. The nucleus should be formed on a political rather than a geographical basis, and composed of the democracies most experienced in this problem of constituting and maintaining interstate self-government. These 15 founders were suggested as having the necessary qualifications in political and material strength: the U.S.A., Britain, Canada, Eire, Union of South Africa, Australia, New Zealand, France, Switzerland, Belgium, Holland, Denmark, Norway, Sweden, Finland.

Within a few weeks of publication readers began spontaneously organizing themselves in local committees in the U.S. From these grew in July 1939 the national organization, of which Streit is president. Independently, Federal Union organization developed in Great Britain, France, Australia, New Zealand, South Africa, Canada, Eire, Argentina and elsewhere, the first two beginning before publication of *Union Now* in London and Paris.

The war began and the democracies fell one after another until finally, on June 16, 1940, the British government made the first offer of a democracy to unite on the "Union Now" basis—a vain, last-minute offer to France, which was rejected 13 to 10 (according to unofficial reports) by the French cabinet. With only the English-speaking members of the 15 free to unite, Streit published a full-page advertisement in the *New York Times* July 15, 1940, proposing that the U.S. invite the British commonwealth to form a provisional union with it at once. He expanded this idea in *Union Now With Britain*, published in March 1941. This sequel to *Union Now* applies its basic principles to the problem of winning the war.

Streit is of old American stock and was for ten years the *New York Times* correspondent in Geneva (1929–38). He wrote *Union Now* first in 1933–34 and, after five years of failure to find a publisher, printed at his own expense and gave away 300 copies of a private edition in Oct. 1938. World sales of each of his "Union" books totalled in 1941 more than 200,000 copies, including distribution of both by the Book-of-the-Month club as a 1941 dividend.

Federal Union, Inc., had 103 chapters scattered through many states when it held its first national convention in Cleveland, Ohio, in June 1941. Its policy is summed up in its slogan: "For American leadership in forming a federal union of free peoples as the nucleus of a world government—now." According to *Fortune* survey published Dec. 1941, 34.9% of the adult American population then favoured the U.S. joining a union of democracies in all parts of the world to keep order after the war.

(C. K. S.)

Union of South Africa: *see* SOUTH AFRICA, THE UNION OF.

Union of Soviet Socialist Republics. A state of eastern Europe and northern and central Asia. Area (Aug. 1939), 8,175,500 sq.mi., over one-fifth of which lies within the polar circle; pop. (Jan. 17, 1939, census), 170,467,186. The area added to the U.S.S.R. in 1939 and 1940 (eastern Poland, the Baltic states, the Finnish conquests and Bessarabia) was about 174,500 sq.mi. and brought the estimated total population in 1940 to 193,000,000. The general increase in the population of the U.S.S.R. for the period of 12 years to Jan. 1939 amounted to 23,439,271, or 15·9%, the rate of increase varying throughout the period. Sixty-four per cent of the population of the soviet union lived in the Russian Soviet Federated Socialist Republic (78% of the U.S.S.R. territory), the remaining 36% of the population being distributed almost in equal halves between the Ukrainian S.S.R. (2% of the territory) and the nine other union republics (total territory, 20%). In Jan. 1939, Great Russians constituted 58·4% of the population (as against 53% at the end of 1926); Ukrainians, 16·6% (21·2%); White Russians, 3·1% (3·2%); Uzbeks, 2·9% (2·7%); Kazaks, 1·8% (2·7%); Tatars, 2·5% (2%); Jews, 1·8% (1·8%); Azerbaijanis, 1·3% (1·2%); Georgians, 1·3% (1·2%); Armenians 1·3% (1·1%). Altogether some 60 different ethnic groups are comprised in the union. The 140-odd languages and dialects spoken in the U.S.S.R. belong to the following groups: Indo-European, Caucasian, Semitic, Ural-Altaic (Finno-Ugrian, Samoyede, Turkic, Mongolic, Tungusic), Palaeo-Asiatic and Far Eastern. Capital: Moscow (4,137,018). Ten other cities had a population of over 500,000 in 1939: Leningrad (3,191,304), Kiev (846,293), Kharkov (833,432), Baku (809,347), Gorki (644,116), Odessa (604,223), Tashkent (585,005), Tiflis (519,175); Rostov-on-Don (510,253), Dnepropetrovsk (500,253). Premier and dictator in 1941: Joseph Stalin (*q.v.*).

History.—The momentous year 1941 opened with what appeared to be an omen of continued friendly relations between the U.S.S.R. and Germany. On January 10 a series of four agreements was signed in Berlin and Moscow, extending the trade agreements of the previous year, fixing the new frontier between Lithuania and Germany and arranging for an exchange of nationals between the two countries; the object of the latter clause was to secure the repatriation of some 50,000 Germans dwelling in the Baltic states. On February 27 a two-year treaty of commerce and navigation between the U.S.S.R. and Rumania was signed.

It later became clear, however, that German-soviet relations had been growing increasingly strained following the visit of Foreign Minister Molotov (*q.v.*) to Berlin the previous November, a meeting which had resulted in the refusal of certain proposals made by Germany for closer collaboration. On April 19, indeed, *Pravda*, the organ of the Communist party, announced for the first time that during Molotov's Berlin visit "suggestions were made to the soviet government to adhere to the Tripartite Pact and to transform it into a Four-Power Pact" but that "the soviet government did not find it possible to accept this offer." Previous to the publication of this statement, an announcement by Andrey Vyshinsky, vice-commissar for foreign affairs, on the entry of German troops into Bulgaria made it clear that the soviet government viewed with disfavour Germany's expansion in southeastern Europe and was prepared to make public its attitude on this matter. "The soviet government cannot share the opinion of the Bulgarian government (Vyshinsky's statement ran) that the presence of German troops in Bulgaria will facilitate the preservation of peace. The soviet government take the view that this would lead to a widening of the theatre of war." A month later, on the overthrow of the pro-axis government in Yugoslavia, an editorial in *Pravda* paid tribute to "the Yugoslav nation (which) has so glorious a past" and which had shown itself "worthy of this past and deserving of congratulations." On April 6 a pact of friendship and nonaggression was signed in Moscow with the representative of the new Simovitch government, by which each contracting party pledged itself "to preserve its policy of friendship" in the event the other became the object of aggression by some third state. On April 30 two events occurred that were indicative

of growing tension. Anastas Mikoyan, commissar for trade, introduced a ban on the transit of all war supplies through the U.S.S.R.; and on the same day *Pravda* carried an announcement of the landing of 12,000 German troops in Finland four days previously. In his May day speech Marshal Timoshenko (*q.v.*), commissar for defense, stressed the need for preparedness in view of possible "surprises" in the international situation.

Meantime, in the far east, the new year had commenced with a trade agreement signed on January 13 between the U.S.S.R. and the Chinese government in Chungking, providing for the exchange of tea, wool and certain minerals from China against soviet military supplies. This agreement followed an official warning to Japan a month previously that the policy of the soviet government towards China remained unchanged. The visit of Matsuoka (*q.v.*) to Moscow and then to Berlin at the end of March, which included conversations both with Stalin and with Hitler, gave rise to speculation in some quarters as to the possibility of a new four-power agreement by which the U.S.S.R. might purchase security from attack both in the east and the west in return for participation in axis designs. These speculations were, however, to prove groundless. On his return journey through Moscow Matsuoka stayed several days to confer with Molotov concerning the possibility of an agreement between the two countries; and on April 13 a soviet-Japanese pact of friendship and neutrality was duly signed. This bound "both contracting parties to maintain peaceful and friendly relations," and provided that "if one of the contracting parties is the object of military action by one or more states, the other contracting party will observe neutrality throughout the whole duration of the conflict." Japan further agreed to recognize the territorial integrity of Outer Mongolia in return for soviet recognition of the territorial integrity of Manchoukuo. It seems clear, however, that the soviet government by this pact conceded less than the other party to it had desired. *Pravda* was quick to point out that it was a pact of neutrality and not a full treaty of nonaggression; and Chungking was informed that it would make no difference in soviet relations with China. In certain Japanese circles there was criticism of the agreement, and Matsuoka found it necessary to explain that while the pact was "advantageous to the soviet union" it was "also beneficial to Japan." *Pravda* on April 19 issued a denial that it was either "directed against Germany or dictated by German pressure."

Economic Developments.—About the same time there were significant developments in the spheres of economics and of administration. The budget estimates, which were approved by the Council of Nationalities on March 1, provided for a total expenditure of 216,000,000,000 roubles, of which 37% represented expenditure on defense purposes. This figure for defense expenditure represented a 50% increase over that of the previous year and was three times the 1938 figure. In the administrative sphere the principal changes were: in February, the dividing of the commissariat for internal affairs into the commissariat for internal affairs (which continued to control the G.P.U.) and a new commissariat of state security, with Beria continuing as head of the former and his former assistant, Merkulov, as head of the latter; the appointment of Stalin as chairman of the Council of People's Commissaries by decree of the praesidium of the supreme soviet on May 6, Molotov retaining his office as commissar for foreign affairs; and the replacing on June 11 of Vannikov by Ustimov as commissar for armaments. At the eighteenth party conference earlier in the year there were newly appointed to the central committee, either as full or as substitute members of it: the ambassadors in Berlin and London and Otto Kuusinen, president of the Karelian Finnish Soviet Republic.

In a report to the same conference on the economic plan for 1941 and the results of the plan for 1940 by the chairman of the State Planning commission, emphasis was laid on the need to increase the output of the metal and the oil industries, the progress of which "cannot be regarded as adequate." After 1937 (the final year of the second five-year plan) the daily output of pig iron was reported to have increased from 40,000 to nearly 47,000 tons, of steel from 50,000 to 58,000, of coal from 370,000 to 467,000, and of oil and oil-gas from about 85,000 to just under 98,000. After 1937 the output of aluminum had been increased 50%, of copper 65%, while that of nickel and tin had been quadrupled. The plan for 1941 provided for an increase in the gross output of industry by 17% or 18% over the previous year, of oil by 11%, coal by 16%, of iron and steel by more than 20%, of aluminum by 66%, of nickel by 99%, of machine-tools by 28%, and of railway locomotives by 42%. Cotton fabrics and leather footwear were to increase by 11% in each case, sugar by 27%, and the output of the food canning industry by 24%. As regards railway transport, the assignments for capital investment were to be increased by 55% over the previous year. Particularly large increases of capital investment were also designed for the iron and steel, engineering and oil industries and for electrification. Emphasis was to be placed on the development of river transport and on the elimination of irrational cross-hauls in freight transport between different industrial areas.

Toward the end of May and the first half of June there was an increasing number of reports of hostile German military preparations on the frontier. There were two events which at the time caused numerous observers in England and the United States to be sceptical of any impending rupture of German-soviet relations. First of these was the withdrawal of recognition by the Moscow government of the *émigré* governments of Norway, Yugoslavia and Belgium, and the closing of the legations of these governments

A MERE BOY, apparently, is this Russian prisoner (centre) photographed in the summer of 1941 in a German camp

in Moscow on the ground of "the loss of sovereignty by these governments." Secondly, there was an official denial, through the Tass agency, of the reports of hostile troop concentrations by Germany inside its eastern frontier—reports which were stigmatized as "absurd and hostile propaganda spread by forces hostile to Russia and Germany." It was further denied that Germany had presented any demands or had asked for closer collaboration with the soviet government. The dispatch of troops to northeast Germany was declared to be "apparently connected with purposes which have no connection with Russia," while the call-up of reservists and the commencement of manoeuvres by the red army was in accordance with normal procedure at that time of the year.

Beginning of the German Attack.—At 4 o'clock on the morning of June 22, without a declaration of war or any explicit warning, Hitler's attack on the U.S.S.R. was launched. German land forces advanced across the frontier on an 1,800-mile front from Finland to the Black sea. Contemporary estimates placed the German strength at between 150 and 180 divisions; while soviet strength was estimated at somewhere between 150 and 200 divisions. An hour later Goebbels read Hitler's proclamation, in which he accused the soviet government of breaking the German-soviet pact of 1939, intriguing with Britain against Germany and, in particular, of encouraging Yugoslavia to resist German plans in the Balkans. "In this very hour," he said, "a movement of troops is taking place which in its extent and magnitude is the greatest the world has ever seen." At 11.15 A.M. Molotov broadcast an official statement denouncing "this unheard-of attack on our country (which) is without example in the history of civilized nations." "This war," he said, "has been forced on us, not by the German people, not by the German workers or intelligentsia, whose problems we thoroughly understand, but by a clique of bloodthirsty fascist leaders of Germany who have oppressed the French, the Czechs, the Poles, the Serbs, the Norwegians, the Belgians, Denmark, Holland, Greece and other nations." On the same day, Italy declared war on the soviet union, and General Ion Antonescu (*q.v.*), in an order of the day to the Rumanian army, announced that his country was engaged in a "holy war" on Germany's side to recover Bessarabia. At 9 P.M. on the same fatal day, Churchill made his historic broadcast announcing that: "Any man or state who fights against naziism will have our aid. Any man or state who marches with Hitler is our foe."

Two days later Hungary broke off diplomatic relations with the U.S.S.R.; the government of Slovakia declared itself "on Germany's side"; while Finland issued the ingenuous statement that it intended to remain neutral. Before many days had elapsed, Italian, Finnish, Hungarian and Rumanian troops were taking part in the German operations against the soviet union; and later special contingents raised in Vichy France and in Spain were added to their number.

There can be little doubt that expert military opinion both in Britain and in the U.S. had been sceptical of soviet military efficiency and equipment, and that the resistance which the red army and air force presented to the carefully-prepared onslaught of the German *Wehrmacht* amazed the world. Equally surprising to those who had counted on internal political dissension were the morale and unity of the soviet people in face of attack, and the heroism and initiative of the ordinary soldier, guerrilla fighter or civilian. Clearly, soviet efficiency surprised even the German general staff, and deranged the Hitlerite plan of rapid penetration, encirclement and annihilation of the soviet armies. The earliest success of the Germans was the occupation of Brest-Litovsk, Lomza and Kolno on June 23. These places were held apparently only by frontier-guard forces, which had never been intended to be more than a screen to delay the initial onslaught, pending the assembly and deployment of the main forces of the red army farther east within the pre-1939 borders of the U.S.S.R. At the same time the initial German thrust into the Baltic states towards Siauliai was repulsed with the loss of 300 tanks, and the advance of German and Rumanian troops into Bessarabia was held at all points. On June 24 the soviet air force, which Germans had claimed was "annihilated on the ground" during the first two days, carried out bombing raids on Constanta and Sulina and later on Bucharest, Koenigsberg, Danzig, Lublin, Warsaw.

By the end of June the most successful of the three main German drives proved to be that towards Minsk, and on June 29 the Germans claimed to have by-passed that city. Russian withdrawals had also taken place in Lithuania, and the Germans had claimed as early as the 24th the capture of Vilna and Kaunas. Farther south, giant tank battles were reported to be taking place in the Luck area. The combined Finnish-German offensives towards Murmansk and the Karelian isthmus had made little progress, and the German-Rumanian penetration into Bessarabia had been frustrated. By July 1 the Germans claimed not only the possession of Libau, Minsk, Lvov, Riga and Ventspils and to have reached the Berezina and also the Dvina between Dvinsk and Riga, but the destruction of 4,000 Russian planes, 2,200 tanks and the capture of 40,000 prisoners; to which the Russians replied that their true losses were 900 tanks, 850 planes and 15,000 missing or prisoners, against German losses of 2,500 tanks, 1,500 planes and 30,000 prisoners. By the end of the second week, however, the Germans had been successful in occupying nearly all of what had formerly been Poland and the Baltic states with the exception of Estonia. They claimed that "the greatest battle of encirclement in world history" was in progress in the Minsk and Bialystok areas, and talked of 400,000 prisoners and the destruction of 7,600 tanks, 4,400 guns and 6,000 aircraft. Again, a week later, they were speaking of 9,000,000 soldiers engaged "in a battle which surpasses all historical precedent and conception," and were claiming the crossing of the Dniester in the south, a penetration beyond Smolensk in the centre and the capture of Novograd-Volynsk in the western Ukraine.

Foreign Relations after the Attack.—The German attack and the new war on the eastern front occasioned considerable diplomatic activity in Moscow, London and at Washington; and the new alignments which followed Churchill's declaration on June 22 were in some respects quite startling. On July 13 was signed the Anglo-Russian pact of mutual assistance. A week later the soviet government resumed diplomatic relations with the *émigré* governments of countries occupied by Germany, and on July 18 a soviet-Czech treaty of mutual assistance was signed by Ivan Maisky and Jan Masaryk, providing for "mutual aid and support in the war against Germany" and for Czech military units to be formed on soviet territory to operate under the soviet high command. On July 30 a soviet-Polish agreement was signed by Maisky and General Sikorski at the foreign office in London, by which the soviet government recognized that "the soviet-German treaties of 1939 as to territorial changes in Poland have lost their validity" and the Polish government declared that it was not bound by any agreement with a third power directed against the U.S.S.R. Arrangements were forthwith made for the raising of a Polish army on soviet soil to operate under its own commanders but operationally to be subordinated to the soviet high command.

On July 30 Harry Hopkins (*q.v.*) arrived in Moscow as the personal emissary of President Roosevelt to Stalin. On August 16 there followed an Anglo-Soviet trade agreement signed in Moscow by Sir Stafford Cripps and Mikoyan, under which Britain extended an initial credit of £10,000,000 to the U.S.S.R. at 3% for five years. On September 26 an exchange of letters took place between Maisky and General de Gaulle (*q.v.*) in which the soviet government extended recognition to the Free French government and

"AN UNEXPECTED GUEST" dropped into the bed of the democracies June 22, 1941, when Germany launched its attack on the U.S.S.R. Cartoon by Thomas of the *Detroit News*

promised the latter full aid and support. On August 10 the British and soviet ambassadors in Ankara presented identical declarations to the Turkish foreign office, confirming their fidelity to the Montreux convention and assuring the Turkish government that they cherished "no aggressive intentions or claims whatever with regard to the Straits," were "prepared scrupulously to observe the territorial integrity of the Turkish republic," and would "render Turkey every help and assistance in the event of her being attacked by a European power." In view of German intrigues in Iran, British and Russian forces jointly entered Iranian territory on August 25, and on September 17 entered Tehran, the capital. On September 28 Lord Beaverbrook (*q.v.*) and Averell Harriman, representing the British and U.S. governments respectively, arrived in Moscow for a three-power conference on supplies; and on October 3 it was announced that the U.S.A. and Great Britain had agreed to send large war supplies to the U.S.S.R.

At home, within a week of the German attack, the government in Moscow had announced the formation of a State Defense council (on June 30) consisting of Stalin, Molotov, Beria, Malenkov and Marshal Voroshilov. On July 11 this council appointed Marshals Voroshilov, Timoshenko and Budenny (*qq.v.*) commanders respectively of the northwestern, the central and the southwestern sectors of the front; while on July 20 a government decree appointed Stalin to the post of defense commissar in place of Marshal Timoshenko, who became an assistant commissar for defense together with Lieutenant-Generals Fedorenko, Zhigarev and Zhuliev, and M. Schadenko. Three days previously, the office of political commissar in the army (abolished in August 1940) was reintroduced by a decree signed by President Kalinin. In September the Defense council announced the introduction of compulsory military training for all male citizens between 16 and 50.

In view of past controversies, an official announcement made in Moscow on August 15 on the religious question attracted considerable attention from public opinion in other countries. This announcement stated that there existed in the soviet union as many as 8,338 churches, mosques and synagogues and 30,000 registered religious societies. Maisky, in an address to the American Chamber of Commerce in London on September 23, emphasized that freedom of religious belief and worship was guaranteed in the U.S.S.R. under Article 124 of the 1936 soviet constitution.

The Russian Retreat and Counterattack.—Despite the extravagant German claims during the early weeks of the campaign, soviet resistance continued to be of the most stubborn character; and although in face of the weight of German equipment the red army continued to yield ground, these withdrawals were generally in good order and were punctuated by periodic local counterattacks which showed that the initiative was far from being exclusively with the Germans. It soon became clear that the campaign was to bear an entirely different character from the previous Polish and French campaigns with their swift and devastating blitzkrieg. The red army, with its tactics of defense in depth and of cutting off the tank spearhead from its supporting infantry, was successful in furnishing the first effective reply to the blitzkrieg. In addition, the activity of guerrilla fighters, sometimes consisting of soldiers, sometimes of the civilian population in the occupied areas, in harassing the German lines of communication introduced a new element into warfare; as did also the "scorched earth" policy of destroying in retreat everything that could be of the least use to the invader, including factories and machinery, power stations, residential buildings and offices, crops and stores.

In the course of August and September the German advance in the centre, after penetrating beyond Smolensk, was halted. In the northwest, after overrunning Estonia and capturing Tallinn on August 29, the Germans advanced east of Lake Peipus towards Novgorod and the approaches to Leningrad; but repeated assaults against Leningrad itself were repulsed and the attackers were fought to a standstill. The most spectacular German penetration in these months was in the south against the army of General Budenny. In August a pincer move south of Kiev in the region of Uman forced a Russian withdrawal to the line of the Dnieper, resulting in the isolation of Odessa, the garrison of which continued to hold out heroically for more than two months. Eventually, on September 19, this pressure led to the fall of Kiev itself and a further drive in a northeastern direction towards Poltava. By the end of August the Russians had been forced to evacuate important industrial centres like Dnepropetrovsk on the west bank of the Dnieper, and to blow up the famous Dnieper dam at Zaporozhe. In October further German onslaughts in the centre and south resulted in a penetration beyond the Dnieper as far as Rostov and the line of the Don, the fall of Kharkov and an overrunning of the Crimea (except for Sevastopol) as far as the Kerch straits. In the centre the new German offensive, launched, it was said, with the aid of nearly 20,000 tanks, achieved an advance as far as Kalinin, Mozhaisk and Tula; but despite the claim of the chief of the German press department on October 9, that "the campaign against Russia has virtually been decided with the destruction of Timoshenko's army groups," the German advance was again halted within 50 miles of the capital, as it had been earlier halted outside the gates of Leningrad. A series of further heavy offensives against the capital in the course of October and November, while penetrating the outer defenses at certain points, failed to make substantial headway.

The failure of these attempts to take Moscow represented a major defeat for the German forces. Close on the heels of this defeat came a series of Russian counterblows. On the night of November 29–30 came the news that Marshal Timoshenko, by an astute piece of strategy, had recaptured Rostov in the south, and that the army group of General von Kleist had been "completely annihilated." The recapture of Rostov was followed in a few days by that of Taganrog 40 miles to the west. This proved to be the start of the first major soviet counteroffensive of the war. There followed the throwing back of the German forces before Moscow, and the re-

capture of a series of towns including Yelets, Kalinin, Klin and Volokolamsk, and in the north, to the east of Leningrad, the recapture of Tikhvin and Volkhov. Along the whole front, at the end of 1941, the initiative had passed to the red army.

In view of the gravity of the position on the central front in October, most of the government departments, together with the foreign embassies, moved on or about October 17 to Kuibyshev (*q.v.*) (formerly Samara) on the middle Volga. But Stalin and the Defense council remained in Moscow, where, on November 7, the anniversary of the revolution, the usual military parade was held in the Red square before the Kremlin as in previous years. In his speech on the previous day to a special session of the Moscow soviet, Stalin had said: "The German invaders want a war of extermination against the people of the U.S.S.R. Well, if the Germans want a war of extermination they shall have it. . . . We have not, and cannot have, such war aims as the seizure of foreign territories and the subjugation of foreign peoples. . . . Unlike Hitler Germany the soviet union and its allies are waging a war for the liberation of the enslaved peoples of Europe and of the U.S.S.R. from Hitler tyranny." (*See* also WORLD WAR II.)

Economic Planning.—*Third Five-Year Plan, 1937–42.* The number of workers and office employees engaged in national economy increased to 30,400,000 in 1940 as compared with 27,000,000 in 1937. According to the plan for 1941, the number of workers was to be increased to 31,600,000; 350,000 new students were to be enrolled in trade and railway schools and 537,000 in factory training schools. It was estimated that in 1941 industry would obtain 794,000 young skilled workers from factory training schools.

Results for 1940.—In the first three years of the third five-year plan, the industrial output of the U.S.S.R. increased from 95,500,000,000 roubles in 1937 to 137,500,000,000 roubles in 1940, or by 44%, including an increase in the output of the machine-building and metal-working industry by 76%.

In 1940, in spite of the continuation of military hostilities at the beginning of the year, the industrial output of the U.S.S.R. increased by 13,600,000,000 roubles, or by 11%, as compared with 1939, including an increase in the output of the machine-building and metal-working industry by 19%.

The output of means of production in 1940 increased by 13.8% as compared with 1939, and by 52% as compared with 1937. The output of articles of consumption increased in 1940 by 7% as compared with 1939, and by 33% as compared with 1937.

In the latter half of 1940 a distinct improvement began in the work of the iron and steel industry, which towards the end of the year achieved an average daily output of 46,000–47,000 tons of pig iron, as against 40,000 at the end of 1937, and an average daily output of 58,000–59,000 tons of steel, as compared with 50,000–51,000 tons. There was likewise an improvement in the work of the nonferrous metals industry. As compared with 1937, the output of aluminum in 1940 increased by 59%, copper by 65%, nickel by 280% and tin by 300%.

A distinct advance, especially in the latter half of 1940, was made by the coal industry of the U.S.S.R. Coal output in 1940 increased by 13%, or by nearly 19,000,000 tons, compared with 1939. In the latter half of 1940, an improvement began in the work of the oil industry, the average daily output rising by the end of the year to 97,000–98,000 tons, as compared with 84,000–86,000 tons towards the end of 1937. Nevertheless, the oil industry still continued to fall short of the program of the third five-year plan.

In 1940 railway freight carriage increased—from 392,000,000,000 ton-kilometres in 1939 to 409,000,000,000 ton-kilometres in 1940. River-borne freight increased to 36,000,000,000 ton-kilometres, as compared with 33,000,000,000 ton-kilometres in 1937 and 34,600,000,000 ton-kilometres in 1939.

There was an increase in the gross harvest of grain, sugar beets, sunflower-seed, potatoes and vegetables. The grain crop of the U.S.S.R. in 1940 amounted to about 7,300,000,000 poods (1 pood=36 lb.). In 1940 there was an increase in livestock in the collective farms; large horned cattle by 12%, pigs by 15%, sheep by 25% and goats by 34%.

There was a steady improvement in the material and cultural standards of the working people of the U.S.S.R. The aggregate pay roll of the workers and office employees of the U.S.S.R. increased in 1940 to 123,700,000,000 roubles, as compared with 82,200,000,000 roubles in 1937 and 116,500,000,000 in 1939. There was an increase in the incomes of the collective farms and in the personal incomes of the collective farmers.

The volume of capital investments in the construction of new plants amounted in 1940 to nearly 38,000,000,000 roubles (including about 6,000,000,000 roubles of decentralized capital investment). Aggregate capital investments for the first three years of the third five-year plan totalled 108,000,000,000 roubles (including 17,500,000,000 roubles of decentralized capital investment). During these three years, hundreds of new mills, factories, mines, power stations and other state industrial establishments were put into operation, the effect of which was to increase the capacity of the coal mines by 51,000,000 tons, the capacity of the power stations by approximately 2,400,000 kw., the capacity of the blast furnaces by 2,900,000 tons of pig iron, and the capacity of the cotton textile mills by about 1,000,000 spindles.

Aims in 1941.—The plan for 1941, the fourth year of the third five-year period was given as follows: (1) To increase the gross output of the industry of the U.S.S.R. to 162,000,000,000 roubles, representing an increase of 17% or 18% as compared with 1940, including an increase of 23.5% in the industries producing means of production, and of 9% in the industries producing articles of consumption; (2) to increase the output of pig iron to 18,000,000 tons, of steel to 22,400,000 tons, and of rolled steel to 15,800,000 tons; (3) to raise the output of coal to 191,000,000 tons, of oil and gas to 38,000,000 tons, and of peat to 39,000,000 tons; (4) to raise the output of the machine-building industry by 26% as compared with 1940; (5) to increase the capacity of the power stations by 1,750,000 kw.; (6) to increase the capacity of the cotton textile industry by 850,000 spindles; (7) to increase the gross grain crop by 8%; (8) to ensure the average daily loading of 103,000 cars on the railways and eliminate the discrepancy between the development of water-borne freight and the requirements of the national economy; (9) to increase the turnover of state and co-operative retail trade to 197,000,000,000 roubles; (10) to increase productivity of labour in industry and building construction by 12%; (11) to lower production costs in industry by 3.7% and thus ensure an additional accumulation in industry amounting to 7,300,000,000 roubles; (12) to increase the number of pupils in the elementary and secondary schools to 36,200,000, and of students in the higher educational establishments to 657,000 so that total expenditure on social and cultural measures should reach 48,000,000,000 roubles; (13) to fulfil the program of capital investment, amounting to 57,000,000,000 roubles (including 9,000,000,000 roubles of decentralized capital investment); (14) to secure a further increase in the state material and financial reserves.

Education.—Elementary and secondary school children in the educational year 1941–42 were estimated at approximately 36,200,000 (an increase of 3.4% over the 1940–41 total); the number of university students was estimated at 657,000 for 1941–42 (an increase of 13%); libraries (1940), 75,000, with 160,000,000 books; newspapers, 9,000 (in 70 languages), with a circulation of 38,000,000; printed books, 700,000,000 copies. Theatres, 790; cinemas, 30,461 in towns and 18,991 in villages.

Finance, Banking and Trade.—Estimates for 1940: capital investments in industry, agriculture and transport from the all-union budget and other sources, 36,100,000,000 roubles (15% increase over 1939). State revenue, 182,600,000,000 roubles (17.1% increase over 1939); state expenditure, 179,700,000,000 roubles (including defense services, 57,066,200,000; national economy, 57,117,500,000; cultural services, 42,875,400,000, of which education, 23,195,000,000). Banks: 37,120 branch banks and agencies; deposits in savings banks, *c.* 7,000,000,000 roubles. Subscription to third five-year plan loan, 9,310,800,000 roubles. Gross retail trade turnover in 1939, 163,456,000,000 roubles. Foreign trade figures were not available for 1939, 1940 and 1941. Merchant marine (vessels of 100 tons and over) (1939), 1,316,000 gross tons.

Agriculture, Manufacturing and Mineral Production.—(Metric tons) Grain crops (1938): wheat, 40,880,000; rye, 20,930,000; oats, 16,990,000; barley, 8,200,000; maize, 2,690,000; rice, 317,000; potatoes (1937), 65,630,000; beet sugar (1939), 2,400,000; tea (1939), 11,200; cotton (1939), 880,000; cotton-seed (1939), 1,900,000; wool (1938), 137,000; flax (1939), 633,000; hemp (1939), 110,000; raw silk (1938), 1,800; rayon (1939), 7,700; wood pulp (1938), 10,800,000; crude petroleum (1939), 29,500,000; natural gas (1938), 2,600,000,000 cu.ft.; coal (1938), 132,888,000; iron ore, metal content (1938), 14,600,000; pig iron and ferroalloys (1939), 15,600,000; steel ingots and castings (1939), 18,800,000; manganese ore, metal content (1938), 1,050,000; bauxite (1938), 250,000; aluminum (1939), 46,000; chrome ore (1937), 90,000; silver (1938), 218,000; gold (1937), *c.* 150,000 kilograms.

Industry and Labour.—While the total population of the U.S.S.R. increased by 16% between 1926 and 1939, skilled workers and intellectuals increased by the following number of times: mechanics, 3.7; turners, 6.8; millwrights, 13.0; locomotive drivers, 4.4; plasterers, 7.0; tractor drivers, 215.0; engineers, 7.7; agronomists, 5.0; scientists, 7.1; teachers, 3.5; physicians, 2.3.

(M. Do.)

Unitarian Church.

During 1941, two events of special significance took place within the organized life of the Unitarian denomination.

1. Beginning June 1, the editorial responsibility for the *Christian Register*, the oldest religious journal in America bearing its original title, was taken over by the board of directors of the American Unitarian association, which had previously assumed financial and publishing responsibility. The *Christian Register* was in 1941 issued under the direction of an editorial board, consisting of the principal executive officers of the association, with Miss Mildred Boie, formerly associate editor of the *Atlantic Monthly*, as editor. The *Christian Register* thus became the official organ of the Unitarian denomination, and appeared as a monthly magazine in a new format, with many illustrations, planned with special concern for the interests of the laity.

2. Five of the principal denominational agencies joined in the united Unitarian appeal, for the purpose of raising funds for the current operations of the American Unitarian association, the Unitarian Laymen's league, the Unitarian Pension society, the Unitarian Ministerial union and the Young People's Religious union. The success of the first campaign, under the direction of Henry D. Sharpe, of Providence, R.I., chairman, guaranteed the continuation of the plan into the future.

The work of the Unitarian Service committee, which was inaugurated in 1940, continued to grow and expand. Through its offices in Portugal and unoccupied France, hundreds of outstanding men and women were brought to safety. In addition, the committee carried on an extensive medical and educational project in internment camps in France. Dr. Charles Joy returned from Portugal in May 1941 to report to the annual meeting of the American Unitarian association on his nine months' work as European commissioner. Dr. Robert C. Dexter, executive director of the Unitarian Service committee, and Mrs. Dexter acted as representatives of the committee in Europe for six months, and reported at the general conference meeting of the association in Pittsburgh, Pa., in October. Dr. Joy returned to Lisbon early in October.

President Phillip C. Nash of the University of Toledo was nominated by the general conference as moderator of the denomination to succeed President Aurelia H. Reinhardt. (*See* also CHURCH MEMBERSHIP.) (J. H. L.)

United Church of Canada. The United Church of Canada, which in 1925 united the Presbyterian Church in Canada, the Methodist Church (Canada) and the Congregational Churches of Canada, reported for 1941 a membership of 716,064 with 1,756,634 persons under pastoral oversight; a Sunday school enrolment of 538,340 and 7,239 preaching places. The church owns property worth over $85,549,557 and raised a total of $11,547,037 for all purposes. Foreign mission work was disturbed throughout the Japanese empire and the occupied areas in China and in Free China.

Among the important features in the life of the United Church during 1941 were the raising of $50,000 to aid British churches overseas in carrying out their spiritual and social ministries in bombed-out areas; an invitation to the heads of other Canadian churches to appoint representatives to meet with representatives of the United Church relative to home missionary cooperation in Canada and the providing of religious education in the public schools and universities; the setting up of a commission on the church, the nation and the world order, whose findings were to be reported to the next general council; the appointment of a committee to study the problem created by the existing number of theological colleges and the advisability of closing some in the interests of economy and a more vital educational policy; the appointment of Rev. Elias Andrews, M.A., B.D., and Rev. Ian F. MacKinnon, Ph.D., to the faculty of Pine Hill Divinity hall, Halifax, N.S.; the appointment of a special financial agent to act under the direction of the board of pensions to solicit special gifts for the capital of the pension fund and the official recognition of a Dominion Woman's Association council and the adoption of a constitution to govern its activities.

During the year the United Church continued its effort to liquidate the deficit on its missionary and general work which had accumulated during the depression years. Already more than $500,000 not included in the above total had been underwritten.

More than one hundred ministers were serving in 1941 as chaplains to the Canadian armed forces or in connection with the auxiliary services of the Y.M.C.A. and the Canadian Legion. The war service units of the congregations furnished 1,250,000 articles of material aid to Canadian soldiers. (G. A. SI.)

United Kingdom: *see* GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

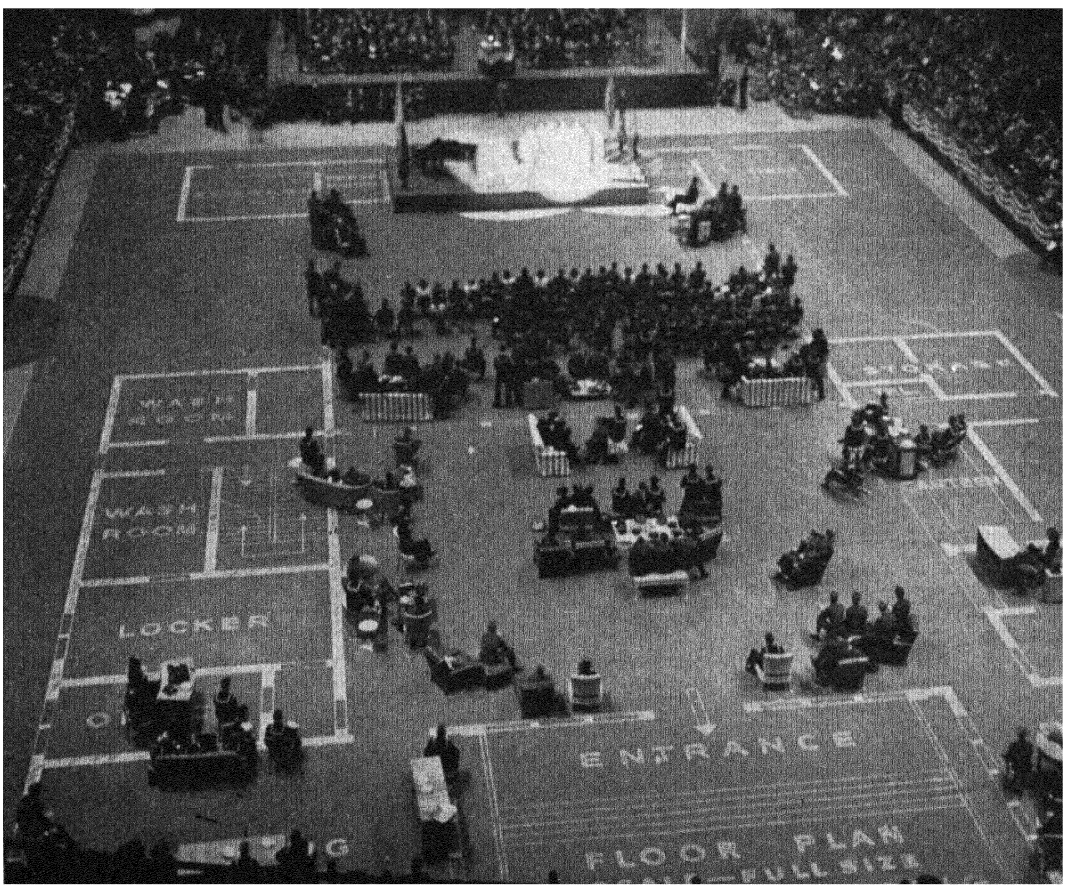
United Nations: *see* AUSTRALIA, COMMONWEALTH OF; BELGIUM; CANADA, DOMINION OF; CHINA; COSTA RICA; CUBA; CZECHOSLOVAKIA; DOMINICAN REPUBLIC; DUTCH EAST INDIES; ETHIOPIA; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; GREECE; GUATEMALA; HAITI; HONDURAS; INDIA; LUXEMBOURG; NETHERLANDS; NEW ZEALAND, DOMINION OF; NICARAGUA; NORWAY; PANAMA; POLAND; SALVADOR, EL; SOUTH AFRICA, THE UNION OF; UNION OF SOVIET SOCIALIST REPUBLICS; UNITED STATES; YUGOSLAVIA.

United Service Organizations. By the fall of 1940 a large military establishment was being developed in the United States. Civil and military leaders alike recognized a great need for recreational, welfare and spiritual service for the men of the army and navy.

While the responsibility for such activities within the camps and bases was undertaken by the government, there were substantially no facilities available in the communities adjacent to the great new defense areas. Since such facilities were to be used while the men were on leave, it was determined that they should be provided by the religiously sponsored private agencies with experience in such work.

To this end the United Service Organizations for National Defense, Inc., was formed, with Walter Hoving as president, to serve as a single fund-raising and supervising agency and to include the

A FULL-SIZE FLOOR PLAN of a typical club for U.S. service men was painted on the floor of Madison Square Garden, New York city, May 20, 1941 for a rally of the United Service Organizations



Young Men's Christian association, the Young Women's Christian association, the National Catholic Community service, the Jewish Welfare board, the Salvation Army and the National Travelers Aid association. A contract between the government and the U.S.O. provided that the government should construct the necessary service clubs in defense areas, approximately 220 in number. For operation of these buildings and rental and operation of some 200 other recreation centres, the U.S.O. agreed to raise, for the first year, $10,765,000.

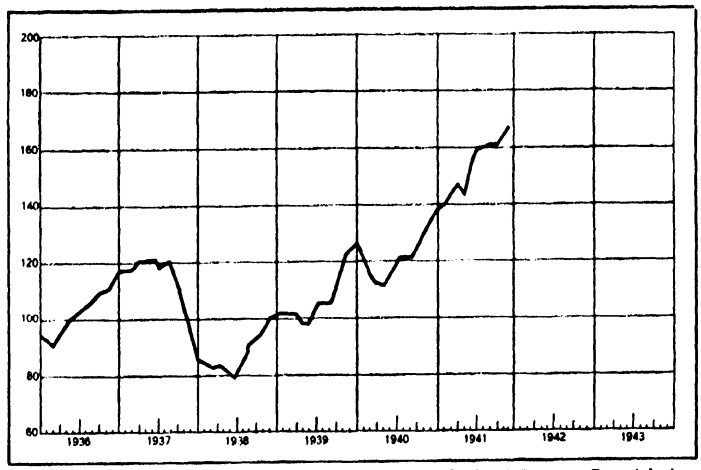
A national campaign for public subscriptions started on June 3, 1941, and before its conclusion 5,400 communities were organized. In view of the extension of the Selective Service act, the original goal of $10,765,000 was increased. The total amount contributed in 1941, including some local funds added to quotas, was more than $16,000,000.

U.S.O. activities in 1941 included (1) operation of clubs for army and navy personnel near camp areas, (2) social programs, comfort facilities and mobile motion picture trucks for the army while on manoeuvres, (3) service to communities in meeting special conditions in defense industrial areas, (4) entertainment in the army camps and naval stations.

The U.S.O. had the co-operation of the war department, the navy department, the recreational division of the Federal Security agency, the Federal Works administration, the joint army and navy committee on welfare and recreation and local communities throughout the United States. (T. E. D.)

United States. The population of the United States in 1940, as determined by the decennial federal census, was 131,669,275, not including possessions. This figure represented an increase of 8,894,229 over the census of 1930. With possessions included, the population was 150,621,231 in 1940. The area of continental U.S.A. is 3,022,387 sq.mi. For population figures of the individual states, *see* the articles on the separate states. *See* also the articles BIRTH STATISTICS; CENSUS, 1940; CHURCH MEMBERSHIP; DEATH STATISTICS; INDIANS, AMERICAN; NEGROES (AMERICAN). (X.)

History.—One topic, and one alone, controlled the policy of the government and absorbed the interest of the people of the United States during the year 1941. That was the attitude which should be taken toward the war waged on three continents between the totalitarian forces of aggression and the defenders of democracy. Every public agency and private activity was affected with this problem of the defense of democracy at home and the nature and extent of the aid which should be furnished to the hard-pressed democracies abroad. Industry, agriculture, transportation, finance, taxation, labour, foreign trade, domestic consumption, military and naval programs, diplomacy and a host of other interests all led to the focal consideration of their effect upon America's influence on the great battle between liberty and tyranny. The contentious issues of the new deal were relegated to oblivion (at least "for the duration" of the war) and Roosevelt's opponent in the presidential election of 1940, Wendell Willkie (*q.v.*), became his ardent collaborator in the policies of national defense and aid to the democracies. Much as the American government and people wished to avoid actual involvement in the war, every month of the year brought the catastrophe closer. Finally, on the morning of Dec. 7, Japanese planes made a surprise attack on Pearl Harbor in the Hawaiian Islands (at the very moment that Japanese envoys in Washington, D.C., were pretending to seek a way to preserve peace) and followed this act by almost simultaneous attacks on the Philippines and other island possessions in the Pacific. Congress with but one dissenting voice immediately declared war on Japan, and three days later also, by a unanimous vote, accepted the state of war thrust upon the United States by nazi Germany and fascist Italy. Thus, the year came to a close with the United States again, as in 1917, engaged in war with formidable powers abroad, and united far more solidly than in 1917 in the determination to prosecute that war with all the material and moral resources of the nation.



INDUSTRIAL PRODUCTION in the United States; Federal Reserve Board Index, with adjustment for seasonal variation (1935–39=100)

Congress.—The first session of the 77th congress opened on January 3 and sat through the entire year. Contrary to predictions that Republican gains in the mid-term election of 1938 would be increased, the Democrats held virtually the same strength in the new congress as they had in the 76th, with 66 senators (to the Republicans' 28) and 268 representatives (to the Republicans' 162). There were one Progressive and one Independent in the senate, and three Progressive, one Independent and four vacancies in the house. On Jan. 6 President Roosevelt delivered his annual message (carried over a network of 660 radio stations). He called for "all-out aid to the democracies" in ships, planes, tanks and guns. Such was not an act of war, he said; and anyway when the dictators should see fit to make war on us, they would not wait for any declaration on the part of the United States—a prophecy to be amply fulfilled. He warned that all should be prepared to "make the sacrifices that the emergency (as serious as war itself) demands," and declared that none should be allowed to get rich out of the program of stimulated industry: none should "clip the wings of the American eagle to feather their own nests." Although he averred that the United States must not lose its social gains under the new deal, the emphasis of his address was on its foreign obligations.

A week after the meeting of congress there was introduced into the house one of the most fateful bills in the history of the U.S., in that it was the beginning of the end of the policy of neutrality which the government had been trying to preserve since the summer of 1935. H.R. 1776, or the lend-lease bill, was a sweeping measure with the title "an act to promote the defense of the United States." It authorized the president to carry out his own recommendation to make the United States "the arsenal of democracy" by providing the anti-axis countries with all such aid as he deemed necessary for the interests of U.S. defense. There was no limit set on the amount of money or material to be furnished, no specification as to the geographical destination of the supplies, no provision as to the terms of payment, and no time limit for the expiration of the act. The bill provoked a bitter controversy in the hearings before the congressional committees and on the floor of the houses. Its opponents condemned it as a surrender of the power of congress, a "blank check" given to the president to give away materials needed for U.S. defense and a long step toward involving the United States in war. Herbert Hoover, Senator Hiram Johnson, Col. Charles A. Lindbergh (*q.v.*), Thomas E. Dewey and even Ambassador Joseph Ken-

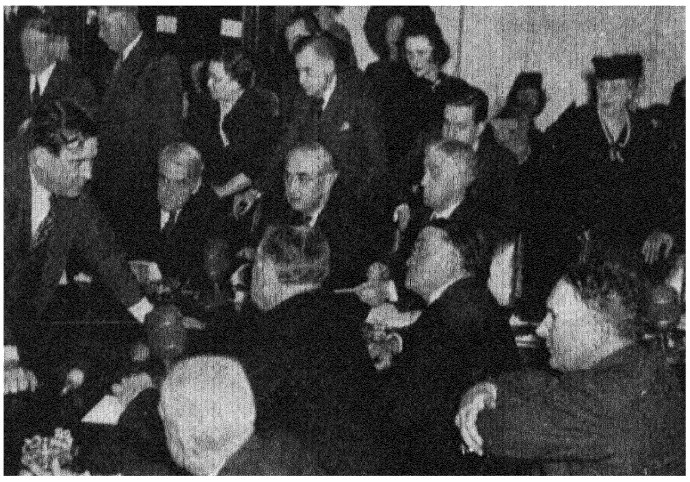
nedy returning from London spoke against the bill; while Secretaries Hull (*q.v.*) and Stimson (*q.v.*), Wendell Willkie and W. S. Knudsen (*qq.v.*) were among the prominent defenders of it. A Gallup poll of Feb. 1, 1941, registered 70% as believing that aid to Great Britain would help keep the United States out of war. The most that the opponents of the bill could accomplish was a set of amendments limiting the operation of the bill to June 30, 1943, prohibiting the convoying of material by American ships and requiring reports to congress every 90 days. On Feb. 8 the house passed the bill by a vote of 260 (236 Democrats) to 165 (135 Republicans), and on March 8 the senate, after another spirited debate, gave a favourable vote of 60 to 31. Three days later the house accepted the senate changes (317 to 71), and the president signed the bill immediately. On March 19 the house, by a vote of 337 to 55, approved a fund of $7,000,000,000 for the implementation of the act. Both the advocates and the opponents of the act were fully cognizant of its probable consequences: the demand for the right of American vessels to carry the materials provided by the lend-lease program, to be armed for the protection of their cargoes against the attack of German submarines, and to be allowed to enter the combat zones for the delivery of their cargoes—all of which was forbidden in the neutrality legislation then standing on U.S. statute books. The third quarterly report to congress (Dec. 1941) showed that, in spite of the nearly $13,000,000,000 authorized, only $585,000,000 had been actually drawn thus far from the lend-lease fund. When the lend-lease pact was signed by Ambassador Winant and Prime Minister Churchill on March 27, the latter remarked that he hoped it would be "Hitler's death warrant." Other important legislation of congress during the year, such as the creation of a National Defense Mediation board in March, the seizure of foreign ships in April, a greatly increased tax bill in September and the repeal of the remainder of the Neutrality act in November, will be treated in subsequent paragraphs.

In time of war or the near approach of war the executive naturally, as the responsible agent of diplomacy and the head of the military and naval forces of the country, assumes a larger share of direction than congress, which tends to become a ratifying body. On the whole, the 47 standing committees of the house and the 33 of the senate, which Woodrow Wilson once called "those little legislatures," offered no great opposition to the recommendations of President Roosevelt.

Budget.—On Jan. 8, 1941, the president submitted to congress a budget of $17,485,528,049 for the fiscal year, of which $10,811,000,000 was for national defense. He estimated the revenue at $8,971,000,000 (including $696,000,000 of social security taxes), leaving a deficit of $9,210,000,000, as against a deficit of $6,200,000,000 for the previous year. He also recommended the removal of the debt limit altogether, and early the next month it was raised at Secretary Morgenthau's request from $49,000,000,000 to $65,000,000,000. In April a 33⅓% rise in taxes was asked for by the secretary to furnish an additional income of $3,444,000,000 and at the same time the axis funds in the United States were frozen by presidential order. At the end of the fiscal year (June 30, 1941) the United States completed the eleventh year of unbalanced budgets, with the national debt increased from $16,185,000,000 in 1930 to $48,960,000,000. The new tax bill went to the house on July 27 and was passed on Aug. 4 by a vote of 369 to 40. With slightly raised figures it was passed (67 to 5) by the senate on Sept. 5. Not only were the surtax rates sharply increased, but the lowered exemptions rendered some 12,000,000 persons liable to income taxes as contrasted with 6,500,000 who would have paid under the house rates. On Sept. 20 President Roosevelt signed the bill. Three weeks later Secretary Morgenthau submitted a revised estimate of the budget needs for the fiscal year 1941–42, calling for an outlay of $24,500,000,000 as against an income set at $12,000,000,000. As a deterrent to inflation caused by the tremendous addition to the currency of the country, the treasury instituted in July the sale of "tax anticipation notes" to furnish corporations and individuals an investment of funds, at a small rate of interest, to provide for future tax payments. By October the sale of such notes had already reached more than $1,500,000,000, and it was anticipated that the sum would be raised to several billions before the close of the fiscal year on June 30, 1942. How much the "victory program" would demand from the people before the defeat of the axis powers is accomplished no one could say. On Christmas day the total war expenditures authorized were given out as $78,000,000,000, of which about one-sixth had been spent, and the president on Dec. 30 estimated that the costs for 1942 would run to half the national income, or more than $55,000,000,000. However, Great Britain was in 1941 spending more than 40% of her national income for the defeat of Hitler, and Hitler himself was spending more than half the German income in the effort to smash the democracies; whereas the United States spent only 15% of its $90,000,000,000 income in the fiscal year of 1940–41 for the defense of the democracies. (*See* also TAXATION.)

FRANKLIN ROOSEVELT telling Winston Churchill good-bye Aug. 12, 1941 aboard the U.S.S. "Augusta" at the close of their four-day conversations at sea

Industry.—The year showed a tremendous boom in industry, as was to be expected under war conditions and mounting profits, in spite of increases in wages and taxes. Steel production, generally regarded as the barometer of business, reached an output of 20,642,345 tons in the third quarter of the year, making a total of 61,550,000 tons for the nine months, a 30% increase over the 1940 figure. The mills were working at an average of 97% capacity, and the profits, despite a wage raise in April of 10 cents



WENDELL L. WILLKIE (left) testifying before the foreign relations committee of the U.S. senate Feb. 11, 1941 on behalf of the lend-lease bill

an hour for 600,000 workers, costing the companies $108,000,000, surpassed even those of the year 1929. Reports from nearly 500 major selected industries showed gains of more than 25% over the previous year. By the end of August the production index had advanced to 162 (taking the period 1935–39 as the basic 100), and dividend payments up to October exceeded those of 1940 by 10%. At the same time a 21% increase in salaries and wages brought income payments to individuals up to $72,609,000,000 in the first 10 months of the year, indicating a total national income for 1941 of more than $90,000,000,000. At the beginning of the year Knudsen of the OPM (Office of Production Management) (*q.v.*) asked the National Manufacturers association for accurate data on the productive capacity of every manufacturing plant in the United States, in preparation for an "all out" performance to supply defense materials. In 1941 no single man was given the power over industry that had been conferred on Bernard Baruch in 1918, but within the limits of the functions of their various boards individuals like Leon Henderson (Office of Price Administration) (*qq.v.*) and Donald Nelson (Supply Priorities and Allocations Board) (*qq.v.*) exercised wide authority. For example, price ceilings were put on a great number of commodities ranging from refrigerators to cigarettes, and the production of nondefense articles, such as pleasure automobiles, was sharply cut. The government, however, refrained from offending organized labour by putting a ceiling on wages, although economists insistently pointed out that it would be impossible to prevent inflation unless both wages and prices were controlled. (*See* also BUSINESS REVIEW; DEFENSE, NATIONAL [U.S.]; PRICES.)

Agriculture.—No such revolutionary farm legislation was enacted in 1941 as the AAA of 1933 or the great "ever normal granary" agricultural bill of 1938. Thanks largely to government payments to the farmers, which had totalled $3,881,000,000 since 1932, the farm income had been raised from $4,600,000,000 in 1932 to about $11,000,000,000 in 1941. Yet the fact remains that one-fourth of the agricultural population of 32,000,000 was on a bare subsistence level. Not only were there some seven or eight million "surplus" farmers competing for an agricultural income which was not sufficient to go round, but a loss of at least $500,000,000 in agricultural exports since the beginning of the European war (exports of wheat, for example, falling from 107,000,000 bu. in 1938–39 to an estimated 20,000,000 in 1940–41, and cotton from 6,000,000 bales to 1,500,000) resulted in a mountain of surplus farm commodities. The senate on April 4 voted by 61 to 9 a record farm appropriation of $1,340,000,000, and a month later by a vote of 75 to 2 increased the crop loans on wheat, cotton, corn, tobacco and rice from 75% to 85% of "parity prices" (of 1909 to 1914), although the president had recommended the 75% figure. The house approved the 85% by a vote of 275 to 63. The president signed the bill on May 25, but there was much criticism of this policy of assuring the farmers artificially high prices just at the time when a ceiling was being set for prices in manufacturing industries. It was denounced as an encouragement to inflation, likely to raise the cost of living by 10%. An editorial of May 27 in the *New York Times* called it "a blow at defense." On Sept. 24 Secretary of Agriculture Claude R. Wickard (*q.v.*) addressed 400 representatives of agricultural departments and farm groups from New England, urging a full output of farm products for 1942 and declaring that "food will win the war and write the peace." A "food-for-freedom" campaign was launched, and in consultations with the British on their probable requirements for the coming year schedules of greatly increased production of milk, eggs, soybeans, fruits, chickens, hogs and cattle were drafted. (Of wheat and cotton the United States had already stored a surplus sufficient for two years.) The U.S. undertook to furnish Great Britain up to June 1942 some 5,000,000,000 lb. of processed milk, 1,500,000,000 lb. of pork and lard, 500,000 dozen eggs, millions of pounds of poultry meat. Predictions of a $13,000,000,000 farm income for the year 1942 were made. (*See* also AGRICULTURE.)

Transportation.—The year 1941 was a banner year for the railroads. Toward the close of the year J. J. Pelley, president of the Association of American Railroads reported that, in spite of unprecedented taxes of $550,000,000 (they were $396,394,774 in 1940), the net income of the roads after the deduction of all charges was about $485,000,000 as compared with $189,000,000 in 1940. For the first nine months of the year the class I roads showed a return of 4·5% on investment as against 2·36% in 1940. In capital expenditure for equipment, in the amount of freight carried, in car loadings and in the types and numbers of locomotives and cars produced the roads set a 20-year peak. The improvement in facilities for handling the vast amount of freight to be moved in wartime had been striking since the days of World War I, when the government had to take over the roads and the congestion was so great that at one time 200,000 cars were on the sidings waiting to be unloaded—"serving as warehouses instead of carriers." Since that time there had been a 60% increase in the speed of trains, a 40% increase in the pulling power of locomotives and a 100% increase in the tons carried per train-hour. When a strike of 14 railroad unions involving some 750,000 men was threatened in February, the employees demanding a two weeks' vacation with pay, the president appointed a board of three (under the provisions of the Transportation act of 1940) to investigate the fitness of the railroads to meet the emergency of the war program. The board was transformed from a fact-finding body to a mediation board when serious labour controversy was threatened by the demand in June of the five railroad brotherhoods (comprising a third of the railroad employees) for a 30% increase in wages. In October the spokesmen for the roads offered a plan, patterned on the Canadian procedure, which they called "emergency compensation," and under which wage payments should be determined by "averaging" the full rise in the cost of living with half the increase in the revenues of the roads. The offer was rejected by the unions, and a nation-wide railroad strike was set for Dec. 7 (which was to prove a fateful day in U.S. history). To avert the crippling of the entire defense effort by such a strike, a settlement was reached at the beginning of December to extend to the close of 1942. It provided for a wage increase of 76 cents a day for 350,000 operating railroad employees and 10 cents an hour for some 800,000 nonoperating workers. The total cost to the roads was estimated at more than $300,000,000 a year, or one and a half times the amount of dividends distributed by the

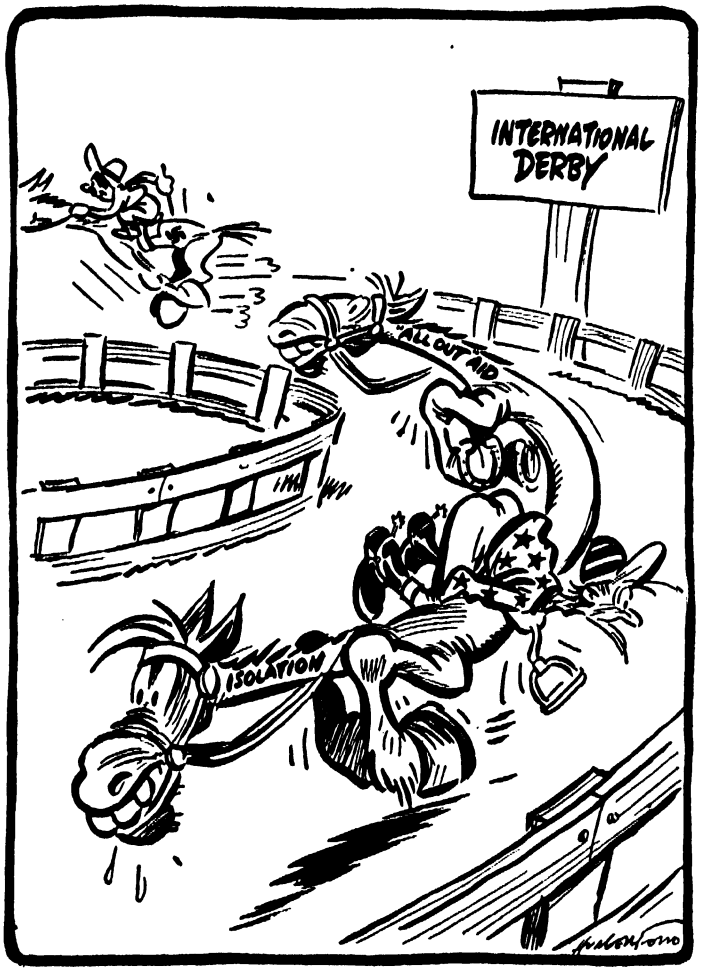
roads in 1940. To balance this additional cost it was certain that the roads would be allowed to increase their rates, since the chairman of the Interstate Commerce commission, Joseph B. Eastman, suggested that such an increase would be in order when the wage agreement was reached. (*See* also RAILROADS.)

Merchant Marine.—The year 1941 saw the United States, with its unrivalled facilities, forge ahead of every other nation in the construction of a merchant marine, which, when the war ended, might well dominate the world's trade routes. After World War I the United States neglected its merchant fleet, and in 1937 only 36% of U.S. imports and 22% of the exports were carried in vessels under the American flag. England, Germany, France, Italy and Japan furnished the carriers of most of our foreign commerce. But in 1941 production of tonnage was far ahead of that of any other country and bade fair to restore the days long ago when American ships carried 85% of U.S. foreign trade. For events of the year *see* SHIPBUILDING; and SHIPPING, MERCHANT MARINE.

Aviation.—Civil aviation (*q.v.*) made great strides in 1941 in the number of millions of passengers and tons of freight carried, the new lines opened, the improved types of planes and the high record of safety. Yet W. A. Patterson, president of the United Air Lines declared that not more than 15% of the potential flying "market" had been exploited. The most remarkable promoter of civil aviation was Juan Trippe, "the modern Magellan" (*see* the *Reader's Digest* of Oct. 1941), who extended the service of his Pan American Airways to 54 distant stations, and who controlled "twice as many route miles as all U.S. domestic airlines combined." New Zealand, Alaska and West Africa had been reached by the summer of the year. On Dec. 6 came the climax, when two Pan American clippers took off from Miami, Fla., for an 8,693-mi. flight from Miami to Leopoldville, Africa, via Puerto Rico, Trinidad, Belem (Pará), Brazil and across the Atlantic to Bathurst and Lagos, Africa. President Roosevelt declared that the importance of the route would be "difficult to overstate." He had already endorsed Trippe's statement that his line was "an instrument of national policy" by announcing on Aug. 18 that Pan American would ferry American bombers across the Atlantic to the British in Libya and the near east. There were some distressing accidents in 1941, although the loss in life was very small when compared with the number of passengers carried in safety. On Oct. 30 came the worst accident of 1941 in civil aviation, when a New York-Chicago plane of the American Airlines fell near St. Thomas, Can., and burst into flames which prevented the rescue of any of the 20 passengers and crew. It was the first fatal accident on that line since Jan. 1936, since when the line had carried 3,500,000 passengers over 1,340,000,000 mi. (*See* also DISASTERS.)

Army and Navy.—At the beginning of 1941 the U.S. army consisted of about 600,000 men and officers; and at the close of the year (after the attack of the Japanese on the Pacific islands) plans were on foot for an army of 7,500,000. On March 21 the house (329 to 0) and three days later the senate (67 to 9) voted a national defense appropriation of $4,000,000,000 to provide for an army of 4,000,000 and 3,600 heavy bombing planes. By June 15 nearly 1,500,000 men recruited under the Selective Service (*q.v.*) act of 1940 were in camps, and on July 10 President Roosevelt asked that the draftees be kept in service at the discretion of the government and that they be allowed to be sent overseas if necessary. Congress gave a grudging consent (the vote was 203 to 202 in the house) to the extension of army service to two and a half years. A new man-power bill was recommended by Secretary of War Stimson, backed by the generals, in December, calling for the registration of all men between the ages of 18 and 64 inclusive for general defense purposes, and of men between 19 and 44 inclusive for active military service. On Dec. 19 both houses agreed on the plan, with the change of 20 for 19 in the lower limit of the men liable for active service. The California senators Johnson and Downey cast the only negative votes. That American soldiers would be called upon to fight in Europe, Asia or Africa seemed little likely in 1941; but the U.S. navy expected to be on duty on the seven seas. Its preparation for the task went forward with vigour during 1941. On Jan. 8 it was organized into three fleets, the Atlantic, the Pacific and the Asiatic, under the command respectively of Admirals E. J. King, H. E. Kimmel and T. C. Hart (*qq.v.*). On Jan. 22, congress by almost unanimous vote approved a naval bill of $909,000,000, and on March 3 the naval committee of the house asked for an outlay of $3,446,311,000 for the fiscal year 1942 for the completion of a two-ocean navy. There were 213 vessels added to the navy during the first 10 months of 1941, and keels were laid down for 436, including 2 battleships, 13 cruisers, 18 submarines, 57 destroyers and various types of minor war vessels. The launching of the battleships "North Carolina" and "Washington" in August put the United States in the lead in that chief class of fighting ships. On April 9, 1941, the United States took the Danish island of Greenland under its protection and on July 7 occupied Iceland, thus extending the zone "necessary for the defense of the United States" far out into the Atlantic. The navy was ordered to patrol

AN EPIDEMIC OF STRIKES In strategic industries slowed U.S. defense efforts throughout 1941. The picture shows police battling strikers who closed the plant of Bethlehem Steel in Lackawanna, N.Y. Feb. 26, 1941



APPRAISAL OF THE DISPUTE between U.S. interventionists and noninterventionists in 1941. The cartoon, by Hungerford of the *Pittsburgh Post-Gazette*, is captioned "A Strange Race Horse"

the seas in this defense zone. Eight American freighters had already been sunk when the attack on U.S. war vessels began with the firing of a German torpedo at the destroyer "Greer" on Sept. 4. The torpedo missed, but on Oct. 17 the destroyer "Kearny" was hit and badly damaged and 11 of the crew killed. Again, on Oct. 30 the destroyer "Reuben James" was torpedoed off the coast of Ireland and sunk with the loss of 76 of her crew of 120. In his Navy day address of Oct. 27 the president reviewed the situation and declared that the order had gone out for the navy to "shoot at sight" on any submarine appearing in defense waters. "Our men are at their posts," he said. "The first shot has been fired; but the most important thing is not who fired the first shot, but who fires the last shot." In spite of many technical difficulties in converting plants and machinery, the production of army and navy planes made remarkable progress during 1941. T. P. Wright of the OPM, writing in *Aviation* for November, declared that the rate of aircraft production in the United States was "greater than for any other country in the world at any period." While Britain had increased its production from 1,600 to 1,800 planes a month, and Germany from 2,200 to 2,300, U.S. production had grown from less than 1,000 a month at the beginning of 1941 to more than 2,000 at its close. He estimated that the figure would rise to 3,500 by the end of 1942. Moreover, the great "flying fortresses," like the Douglas B-19 bomber, built to fly 7,750 mi. and carry 18 tons of bombs, appeared to be superior to any other fighting aircraft in the world. (*See* also AIR FORCES; ARMIES OF THE WORLD; NAVIES OF THE WORLD.)

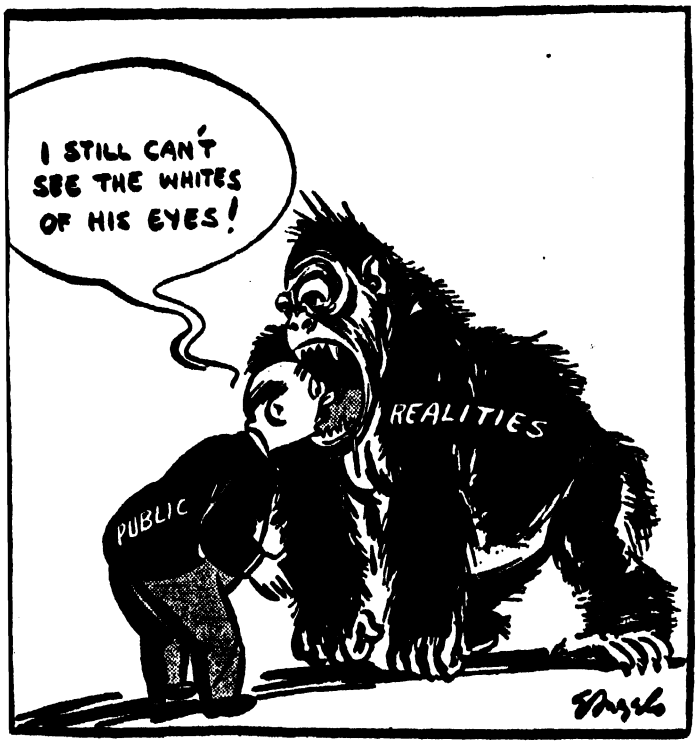
Labour.—The most distressing chapter in the history of the year 1941 was the persistence of labour controversies which were a serious threat to the defense program. Merely to list the strikes and threatened strikes of the year would take columns of space, and hardly a day passed without editorial comment in the metropolitan press on the merits of the strikes, their progress, the efficiency of the machinery set up to deal with them and the attitude of the government toward them. Although Secretary Perkins, who was constantly accused of being too favourable to organized labour, declared that strikes in defense industries were not diminishing production to any serious degree, the figures showed that in the first seven months of the year strikes had increased fivefold over those of 1940, involving 1,327,000 workers and causing a loss of 15,750,000 man-days, as against 273,000 workers and 3,091,000 man-days in 1940. From July 1, 1940, to Oct. 1, 1941, the man-days lost (24,284,981) would have been sufficient to build 10,000 planes. The causes of this wave of strikes were partly the demand for higher wages to keep pace with rising cost of living, partly organized labour's fear of losing through increased governmental regulation some of the gains acquired in recent years, partly "jurisdictional" disputes between the two great and almost equally numerous rival organizations, the A.F. of L. and the C.I.O., as to what unions should be recognized as authoritative in collective bargaining and finally the issue with the employers over the closed or open shop. By mid-March strikes in the electrical, steel, copper, harvester, aircraft and other industries with defense contracts of more than $75,000,000 had made some 30,000 men idle for periods ranging from a few days to more than two months. By mid-June 24 strikes were going on, involving 40,000 workers. There were constant threats of drastic intervention by the government. On Jan. 29 Chairman Vinson of the house naval committee introduced a bill to bar the closed shop and strikes in plants working on naval contracts, and on March 31 Representative Ford of Washington proposed a bill making strikes in defense industries treason, punishable by 25 years imprisonment or by death in case fatalities occurred. On the other hand, Knudsen of the OPM and Secretary Perkins opposed legislation to curb strikes, although Knudsen would allow the government to take over plants which failed to fulfil their contracts. In three important cases that procedure was followed. On June 9 U.S. troops (2,500) opened the plant of the North American Aviation company at Inglewood, Calif., which had stopped work on $200,000,000 of military contracts, expelled the pickets and ended draft deferment for the strikers. On Aug. 23, at the request of President Korndorff of the Federal Shipyard plant in Kearny, N.J., where 16,000 men had struck on work estimated at $450,000,000, the navy took over the yard under the command of Admiral Bowen. And on Oct. 29 the army put an end to a strike in the Air Associates aeroplane factory at Bendix, N.J., placing Colonel R. M. Jones in charge.

Much of the turmoil in labour relations was laid to the uncertainty in the extent of authority and the confusion in procedure of the governmental agencies. To the existing machinery of conciliation in the department of labour was added on March 19 a National Defense Mediation board (*q.v.*) of 11 members headed by Clarence Dykstra (succeeded in June by William H. Davis) and consisting of representatives of employers, labour and the public. Then there was Sidney Hillman's labour division in the OPM and the National Labor Relations board (H. A. Millis chairman) created for the administration of the Wagner Labor Relations act of 1935. But the latter board was limited to jurisdiction within the terms of the Wagner act, while the new NDMB could not take final action, but was obliged to "certify" cases of dispute to Secretary Perkins. There was constant complaint from business that both the sympathy of the administration and the existing legislation were unduly favourable to labour, since only labour had the right to appeal for relief under the Wagner act. The president sent a letter to the A.F. of L. in convention at Seattle, Wash., on Oct. 8, asking that "organizational rivalries

and jurisdictional conflicts be discarded." The convention received his words with cheers—and within the next week the armament program was interrupted by a half a dozen jurisdictional disputes. It became clear that something more than exhortation was needed to guarantee the smooth working of the defense program: something like the war labour board of World War I, for example, which had "frozen" the status of the open and closed shops for the duration of the war, prohibited strikes and lock-outs, recognized the right of collective bargaining and forbidden employers to discharge employees in trade unions. It took two events of major importance, near the close of 1941, however, to bring the creation of an effective war labour board; first the most serious and defiant strike of the year, and second the actual outbreak of war with Japan, Germany and Italy.

At midnight, Oct. 25, in spite of President Roosevelt's request to John L. Lewis to stay the order, 53,000 workers in the "captive" coal mines (those owned by the steel companies) struck. The issue was Lewis' determination to force the union shop on the mines. And behind the strike was the veiled threat of the powerful president of the United Mine Workers to call out the 400,000 miners in the bituminous field. Lewis was denounced in biting editorials and cartoons for defying the president, whose re-election he had strenuously opposed, resigning from the presidency of the C.I.O. when the renomination of Roosevelt occurred. The general indignation at Lewis' stand (a Gallup poll showing 77% opposed to the closed shop) may have had a part in persuading him to meet on Oct. 29 with Myron Taylor and the chairman of the NDMB, Davis, and agree to the opening of the mines. But it was only a truce. Lewis declared that the strike would be resumed (and extended) on Nov. 15 unless the board made a ruling on the issue before that date. On Nov. 11 a lengthy conference took place at the White House between Lewis, Taylor and the president, and the next day the NDMB refused the demand for the union shop in the captive mines by a vote of 9 to 2. Lewis, still defiant, announced that the strike order stood; but on Nov. 22 (the day after 12 miners were shot in a Pennsylvania riot and an appeal was made to Governor James for the intervention of the state police) Lewis called off the strike and agreed to abide by the arbitration of a three-man board consisting of himself, Benjamin F. Fairless of the United States Steel corporation and John R. Steelman of the conciliation committee of the department of labour. Steelman voted with Lewis for the union shop. The second event which spurred the government to more effective action for the control of defense strikes was the declaration of war on Japan (Dec. 8) and on Germany and Italy (Dec. 11). On Dec. 5 (as noted in the section on transportation) a strike of 1,000,000 railroad workers had been narrowly averted. And on Dec. 10 the president decided to call a conference of industrialists and labour representatives at Washington to work out an agreement for peace in the labour field, consideration of antistrike bills pending in the senate to be sidetracked during the deliberations of the conference. The points on which the conference would be asked to agree were: (1) the suspension of all strikes and lock-outs in defense industries for the duration of the war; (2) a 24-hour day and a 7-day week for speeding up production in the arms factories; and (3) the establishment of arbitration machinery for the final settlement of disputes between employers and employees. On Dec. 13 the president announced the names of the conferees, consisting of 12 men prominent in industry and 6 each from the A.F. of L. and the C.I.O. The conference, while failing to pronounce on the closed shop issue, agreed on a three-point policy: namely, the prohibition of strikes and lock-outs, the settlement of disputes by peaceful means and the establishment by the president of a War Labor board. On Dec. 23 President Roosevelt wrote to William H. Davis, the moderator of the conference, accepting its recommendations. (*See* also STRIKES AND LOCK-OUTS.)

"RISING AS ONE MAN," drawn by Orr of the *Chicago Tribune* the day Japan attacked Pearl Harbor



THE U.S. PUBLIC shunned unpleasant facts in 1941, thought Angelo of the *Philadelphia Inquirer*

Isolationism.—During the entire year of 1941, up to the fateful events of December, the noninterventionists fought a determined battle to keep the United States out of the war. They were not generally pacifists, for most of them advocated an armament program to make the United States impregnable to attack by any foreign nation or combination of nations. They were noninterventionists, ranging from persons who believed that it would make no difference to the U.S. whether Hitler won or not, to those who wished to see him defeated but thought that if the U.S. joined the

U.S. MARINES practising beach landings at Guantánamo, Cuba

war against him it would jeopardize democratic institutions, weaken U.S. home defenses and probably mean the sending of U.S. soldiers to fight across the sea. The "America First" committee, headed by General Robert E. Wood (*q.v.*), and the "No Foreign Wars" group were the chief opponents of intervention; and they were countered by the "Fight for Freedom" and the "Committee to Defend America by Aiding the Allies." The most conspicuous noninterventionists in congress were Representative Hamilton Fish of New York and Senators Wheeler of Montana, Nye of North Dakota, Clark of Missouri, Johnson of California and Walsh of Massachusetts. In the protracted hearings before the congressional committees and the bitter debates on the floor of both houses on the Lend-Lease bill (Jan.-March) all the arguments pro and con were aired—arguments which were only repeated again and again in the ensuing battles over the occupation of Greenland and Iceland, the proclamation of a zone of waters far from U.S. shores as necessary to the defense of the United States, the retention of the draftees beyond the time limit set in the Selective Service act of 1940, the convoying of American cargo ships by navy vessels, the repeal of the neutrality legislation of 1939 and other legislative and administrative measures which were condemned by the noninterventionists as steps leading inevitably to war. Charles A. Lindbergh's (*q.v.*) popularity was so great that he was put forward by the America First committee as one of the chief spokesmen for nonintervention. On April 28 Lindbergh resigned from the air corps after President Roosevelt had compared him to the Copperheads of the Civil War and others had called him a traitor. But he was not a traitor. He had no sympathy for the nazis and hoped that Hitler would be beaten. When the U.S. entered the war in December, he volunteered his services. On the other side, persons like Senator Glass of Virginia were urging that, since the U.S. must enter the war eventually, it should do it now. When Secretary of Navy Knox made a speech in Boston, Mass., to this effect on June 30, Senator Walsh of Massachusetts declared that the president should censure him, and Wheeler and Fish called for Knox's impeachment.

In spite of the efforts of the noninterventionists, however, the successive measures of the administration involving the United States in the great struggle between totalitarianism and democracy were endorsed by congress and approved by a growing majority of the public as expressed in the Gallup polls. The Lend-Lease act of March had already nullified that provision of the neutrality legislation which forbade the U.S. to furnish aid to belligerent powers, and on Nov. 17 the president signed the bill repealing the remaining prohibitions. American merchant vessels could now be armed and were free to enter the formerly closed "combat zones." U.S. war vessels had already received the order to "shoot at sight" on any submarines that menaced U.S. convoys. When therefore the declarations of war came in December, they were only the registration of an accomplished fact. The United States had been actually at war with Hitlerism for many months. The declaration, however, dispersed the last remnants of isolationism. The Wheelers and Lindberghs and Nyes and Fishes rallied as one man to the prosecution of the war to a victorious finish. Opposition was left to the "fifth columnists," the Bundists and other traitorous agents of the axis powers within the gates. Because the final repeal of the neutrality legislation had been carried by the narrow vote of 212 to 194 in the house (the opposition being largely a rebuke to the president for not taking more drastic measures against the strikers in defense industries), the nazis took it as a sign that the people of the U.S. were a fatally divided nation.

Latin-American Relations.—The "good neighbour" policy toward the Latin-American republics was strengthened by the consciousness of the need for closer co-operation for hemisphere defense against possible nazi aggression. Although German and to a lesser extent Italian propaganda was rife in these countries, their governments (even dictatorships like Brazil, Cuba and most of the Central American republics) inclined toward the United States, especially after a congressional resolution of April 1 gave legal sanction to the Monroe Doctrine by binding the United States to oppose any transfer of sovereignty in the western hemisphere to a foreign power. The increase of import trade with Latin America, offsetting their loss of foreign markets, also served to strengthen the bonds and was an effective answer to the nazi propaganda that the "good neighbour" policy was a failure because the United States could not absorb the Latin-American surpluses. Furthermore, the United States made considerable loans to Argentina, Brazil, Cuba, Peru, Bolivia, Chile and Nicaragua. Two pacts with countries with which it had had more or less political and economic friction were particularly significant for better relations. On Oct. 14 an agreement was signed at Buenos Aires which President Roosevelt called "an outstanding contribution" to the reconstruction of peaceful trade. It reduced duties on Argentine canned meats, hides, wool and certain dairy products (comprising 30% of its sales in 1940) and lowered the tariff on a large percentage of U.S. exports to Argentina. It was the first such treaty since

1853. Again, after months of negotiation, a pact was signed with Mexico on Nov. 19 providing for a settlement of the controversy over the seizure of U.S. oil and land properties in 1938. Mexico agreed to pay $37,000,000 for the land expropriations, while the U.S. promised to purchase $25,000,000 of Mexican silver annually and to loan Mexico $30,000,000 for highway construction. Earlier in the year Undersecrêtary Welles and Ambassador Najera had signed an agreement for the reciprocal use of U.S. and Mexican air bases, and Mexico had followed the U.S. lead in the seizure of German and Italian ships. On July 17 President Roosevelt blacklisted some 1,800 Latin-American firms (to which 519 were added in November) which had ties with the axis countries. Meanwhile Nelson A. Rockefeller's committee on the Cultural and Commercial Relations between the American Republics continued its work. Groups of American students visited Colombia, Peru and Brazil; and delegations of professors and students from more than a half dozen South American countries, as well as journalists from Chile, doctors from Cuba, social workers from various countries, aviation students from the five Central American states and other groups came to the United States. A conference of the foreign ministers of the American republics on hemispheric defense had been set for Jan. 15, 1942, at Rio de Janeiro, Brazil. (*See* also HISPANIC AMERICA AND WORLD WAR II.)

Foreign Relations.—The sense of the mission of the English-speaking peoples to form the bulwark against the attacks of the axis powers grew steadily clearer during the year 1941, and reached the point of a virtual alliance when President Roosevelt and Prime Minister Churchill met on a battleship in the Atlantic on Aug. 14 and drew up the eight points of the "Atlantic Charter," which set forth (somewhat in the language of Wilson's 14 points of 1918) the aims of the democracies in the war. On Nov. 10, when the threat of war in the far east loomed, Churchill declared that Great Britain would declare war on Japan "within the hour" if that power should attack the United States. The pledge was fulfilled and the close of 1941 saw not only Great Britain and the United States, but China and the Dutch Indies also fighting to prevent Japan from the conquest of the far east. Churchill spent

"STEADY DOES IT!" Sound advice from the pen of Little of the *Nashville Tennessean* after U.S. entry into World War II in Dec. 1941

Christmas in Washington, D.C., and on Dec. 26 he received an ovation when he addressed both houses of congress, before proceeding on a similar errand to Ottawa.

Relations with Germany during 1941, until the declaration of war on Dec. 11, were abnormal. Although President Roosevelt repeatedly denounced the nazis as the enemies of the United States and issued orders (Sept. 11) for U.S. destroyers to "shoot at sight" on German submarines, the German embassy at Washington under the charge of Herr Thomsen remained open—but virtually ignored. The president in his address to the nation on Sept. 11 declared that the German leaders were not concerned with what the U.S. government said, and that if they chose to attack us they would select their own time and method. Therefore he made no diplomatic move when the "Kearny" was hit and the "Reuben James" was sunk. Neither did the nazi declarations about the responsibility for such attacks affect him. In his Navy day address of Oct. 27 he asserted that he had documents to prove a nazi plan to divide Latin America into five vassal regions and to abolish Christianity by substituting *Mein Kampf* for the Bible and the swastika for the cross. Berlin dismissed these accusations as too ridiculous to notice; but Hitler's proclamation of the exclusive pagan nazi religion at the opening of the new year showed that the president was right. On June 6 all the nazi consulates in the United States were closed, and on July 15, 450 axis agents were deported.

Japan's insistence on the dominance over China and the extension of her program for the imposition of the "new order" upon the far east by the infiltration of Indo-China and Thailand led to increasing tension between the United States and the Mikado's empire. Although Ambassador Admiral Nomura's letter to President Roosevelt of Feb. 14 protested a desire for peace with the United States, the Japanese would not abate its policy of aggression. Great Britain and the United States froze the Japanese assets in their countries and halted the supply of aviation fuel to the island on July 25; but economic pressure deterred the Japanese no more than diplomatic persuasion. The war lords were in power in Japan, defiant and boastful—doubtless encouraged by the expectation of the rapid triumph of their axis partner Hitler. On Oct. 16 the director of naval intelligence in Tokyo declared in a public speech that the Japanese navy was "itching for action," and the news agency Domei flayed the United States for "double dealing" in persisting in an attitude of hostility to Japanese policy while carrying on insincere negotiations for peace. But it was Japan itself that played this role. Japan's special envoy Saburo Kurusu (*q.v.*) arrived at Washington on Nov. 15 with "last proposals" from Japan and the bland assurance to the reporters, "We must all pull together for peace." But even as he and Ambassador Nomura were politely discussing the situation with the president and Secretary Hull, Japanese planes swooped down on Pearl Harbor, U.S. naval base in Hawaii, on the morning of Sunday, Dec. 7, and in their surprise attack sank the battleship "Arizona," three destroyers, a minelayer and a training ship, and caused about 3,000 casualties in the combined U.S. and Filipino forces under General Douglas MacArthur (*q.v.*). This was followed immediately by attacks on the American islands of Wake, Guam and the Philippines, and the British possessions of Hongkong and the Malaya peninsula, with its great base at Singapore. For this "infamous" treachery, planned long weeks in advance, the president called for a declaration of a state of war with Japan (Dec. 8), which was voted with but one dissenting voice in congress. The United States was caught unprepared in the Pacific and suffered serious initial losses, including the fall of Manila at the beginning of 1942. But the crisis united the American people in the grim determination to spare no expense in men, money or material to put an end to the lawless power of the axis partners. Twenty-

six nations were at the close of 1941 bound together in that pledge. (*See* also ANTI-SEMITISM; CANADA; DEMOCRACY; HOUSING; INTERNATIONAL LAW; JAPAN; MEXICO; PROPAGANDA; PUERTO RICO; ROOSEVELT, FRANKLIN; SELECTIVE SERVICE; SUPREME COURT; VIRGIN ISLANDS.) (D. S. MU.)

Education.—*See* the articles EDUCATION; ILLITERACY; UNIVERSITIES AND COLLEGES.

Defense.—For information about the armed forces of the United States in 1941, *see* AIR FORCES OF THE WORLD; ARMIES OF THE WORLD; DEFENSE, NATIONAL (U.S.); MARINE CORPS; NATIONAL GUARD; NAVIES OF THE WORLD; WORLD WAR II. *See* also CIVILIAN DEFENSE, OFFICE OF.

Finance and Banking.—Statistics pertaining to the United States will be found in such articles as BANKING; BUDGETS, NATIONAL; BUSINESS REVIEW; NATIONAL DEBTS; NATIONAL INCOME; STOCKS AND BONDS; TAXATION; WEALTH AND INCOME, DISTRIBUTION OF.

Foreign Trade.—World War II continued to produce an abnormally large balance of trade in favour of the United States in 1941. This balance for the first nine months of the year amounted to $900,289,000. Imports from all continents except Europe, however, were greater in 1941 than in 1940. Exports to Europe, Asia and South America declined, while those to North America, Africa and Oceania increased. Exports to the United Kingdom in the first nine months of 1941 were $1,024,212,180, as compared with $698,151,708 in the like period of 1940.

The U.S. department of commerce announced in Jan. 1942 that it would cease publication of its monthly summaries of U.S. foreign commerce, as of Oct. 31, 1941, in order to prevent giving vital information to the enemy. (*See* also BUSINESS REVIEW; INTERNATIONAL TRADE; TRADE AGREEMENTS.)

Communication and Transportation.—For statistics, *see* the articles AVIATION, CIVIL; CANALS AND INLAND WATERWAYS; ELECTRIC TRANSPORTATION; MOTOR TRANSPORTATION; MOTOR VEHICLES; POST OFFICE; RADIO; RAILROADS; SHIPBUILDING; SHIPPING, MERCHANT MARINE; TELEPHONE.

Agriculture.—Stimulated by the government's program of "food for defense," the production of U.S. crops registered substantial increases in 1941 and were well above the averages for 1930–39. All grain crops except oats had larger production. The largest relative increase of all crops was shown by soybeans—from 79,837,000 bu. in 1940 to 111,300,000 bu. in 1941; the ten-year (1930–39) average for this crop was only 35,506,000 bu. Tobacco continued to decline, as did cotton. The total acreage harvested in 1941 was estimated at 325,224,000 ac., an increase of about

Table I.—*U.S. Foreign Trade in Merchandise, by Continents, First 9 Months of 1940 and 1941*
(000s omitted)

U.S.A.	Europe	N. America	Asia	S. America	Africa	Oceania
1940 exports	$1,286,098	$ 761,047	$458,698	$337,538	$111,454	$71,705
imports	320,787	519,441	740,600	280,286	94,598	22,119
1941 exports	1,149,021	1,018,032	452,293	330,093	290,206	77,200
imports	212,423	701,720	806,511	469,643	107,207	119,723

1.5% over the 320,285,000 ac. harvested in 1940. The average harvest for 1930–39 was 328,379,000 ac. Table III shows the production of selected crops from 1932 through 1941.

Shipment of cattle at public stockyards in the first 10 months of 1941 were 4,969,000 (5,078,000 in the same period of 1940); calves, 1,912,000 (2,179,000); hogs, 6,310,000 (7,352,000); sheep and lambs 9,588,000 (9,666,000).

Table II.—*Total U.S. Imports and Exports of Merchandise, 1932–41*
(000s omitted)

Year	Export Total	% Increase	Import Total	% Increase
1932	$1,611,016	..	$1,322,774	..
1933	1,074,994	3.9	1,449,559	9.6
1934	2,132,800	26.5	1,655,055	14.2
1935	2,282,874	7.0	2,047,485	23.8
1936	2,455,978	7.6	2,422,592	18.3
1937	3,349,167	36.4	3,083,668	27.2
1938	3,094,440	−7.6	1,960,428	−36.4
1939	3,177,176	2.7	2,318,081	18.2
1940	4,021,146	26.6	2,625,379	13.3
1941*	3,317,596	9.6	2,417,307	24.5

*9 months; percentages of increase compared with 9 months of 1940.

Table IV lists average prices received by farmers for important crops on selected dates (all in cents).

Manufacturing.—The preliminary report of the department of commerce's biennial census of manufactures for 1939, issued Jan. 15, 1941, estimated the number of establishments at 184,244; salaries and wages at $11,631,967,995 and value of products at $56,828,807,223. The comparable figures for 1937 were: 166,794; $12,829,748,927; $60,712,871,737. The leading industrial groups were as follows: food, iron and steel, motor cars, textiles, chemicals, apparel, and machinery except electrical.

Table III.—*Production Figures of Selected U.S. Crops, 1932–41*
(000s omitted)

Year	Corn bu.	Oats bu.	Wheat bu.	Cotton bales	Tame Hay tons	Rice bu.	Tobacco lb.	Potatoes bu.
1932	2,931,281	1,250,055	756,927	13,003	71,827	41,619	1,017,317	376,425
1933	2,399,632	733,100	551,683	13,049	66,530	37,651	1,371,131	342,306
1934	1,401,123	542,306	526,393	9,636	55,270	39,047	1,081,629	406,105
1935	2,303,747	1,194,902	626,344	10,638	78,138	38,784	1,297,155	386,380
1936	1,507,089	785,506	626,766	12,399	63,536	49,002	1,154,131	331,918
1937	2,644,995	1,146,258	873,993	18,946	73,785	53,364	1,553,405	393,289
1938	2,542,238	1,053,839	930,801	11,943	80,299	52,303	1,378,534	371,617
1939	2,619,137	937,215	754,971	11,817	75,726	52,306	1,848,654	364,016
1940	2,449,200	1,235,628	816,698	12,566	86,312	52,754	1,451,966	397,722
1941*	2,675,373	1,138,843	961,194	10,976	85,733	55,128	1,267,404	376,701

*Preliminary.

Table IV.—*Farmers' Average Prices, Certain U.S. Crops, on Selected Dates*
(in cents per unit)

	Wheat per bu.	Corn per bu.	Oats per bu.	Barley per bu.	Rye per bu.	Buck-wheat per bu.	Pota-toes per bu.	Eggs per doz.	Cot-ton per lb.
Oct. average, 1909–13	88.1	64.8	38.4	60.5	72.0	71.1	65.0	23.8	12.10
Oct. 15, 1936	106.8	97.9	43.1	84.2	80.4	78.3	97.9	27.6	12.23
Oct. 15, 1937	88.7	58.9	28.8	52.0	63.8	62.4	48.5	25.2	8.10
Oct. 15, 1938	52.2	41.9	22.1	36.1	32.9	54.5	51.0	27.1	8.53
Oct. 15, 1939	70.3	47.6	30.3	42.2	45.1	62.7	66.4	22.9	8.73
Oct. 15, 1940	68.2	59.4	28.3	38.2	40.5	54.4	52.0	23.7	9.35
Oct. 15, 1941	91.0	64.9	38.9	49.1	51.3	64.3	67.2	31.8	16.55

Labour.—For data on labour in 1941, *see* the articles AMERICAN FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; RELIEF; SOCIAL SECURITY; STRIKES AND LOCKOUTS; UNEMPLOYMENT; WAGES AND HOURS.

Mineral Production.—Statistical information concerning minerals which was released by the bureau of mines of the U.S. department of the interior in 1941 pertained to the calendar year 1940. According to the bureau's preliminary estimate, the total value of U.S. mineral production in the latter year was $5,582,500,000, an increase of $668,200,000 over the production of 1939. In only five other years—1920, 1923, 1925, 1926 and 1929—had the production of 1940 been exceeded in value. The record year was 1920: $6,981,340,000.

(*See* also the articles on individual minerals; also MINERAL AND METAL PRICES AND PRODUCTION; STRATEGIC MINERAL SUPPLIES.)

Table V.—*Principal Mineral Products of the U.S., 1940 and 1939*

Mineral	Value, 1940	Value, 1939
Petroleum	$1,352,000,000	$1,294,470,000
Bituminous coal	861,166,000	728,234,000
Pig iron	840,442,032	626,824,690
Natural gas	591,509,000	534,240,000
Coke	273,832,410	212,884,050
Gold	210,108,700	196,391,000
Pennsylvania anthracite	205,490,000	187,175,000
Copper	205,453,000	148,236,000
Cement	193,464,869	184,254,932
Iron ore	189,086,799	158,537,696
Stone	160,044,115	158,461,515

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United States Government Departments and Bureaus: *see* GOVERNMENT DEPARTMENTS AND BUREAUS. Also *see* under specific name; *i.e.* COAST GUARD, U.S., etc.

United States Housing Authority: *see* FEDERAL WORKS AGENCY; HOUSING; MUNICIPAL GOVERNMENT.

Universities and Colleges.

The following seven pages carry a selected list of universities and colleges in the U.S. and Canada, with location, year founded, chief executive, enrolment, size of faculty, endowment and number of library volumes, for the academic year 1941–42. An asterisk denotes 1940–41 data; two asterisks denote 1939–40 data. (*See* also EDUCATION.)

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
A							
Abilene Christian College, Abilene, Tex.	1906	Don H. Morris	602	1,467	42	$ —	15,987
Abraham Baldwin Agri. Col., Tifton, Ga.	1933	George H. King	288	—	16	—	8,500
Acadia University, Wolfville, Nova Scotia, Canada	1838	Frederic W. Patterson	415	530	45	1,027,695	82,000
Adams St. Tch. Col., Alamosa, Colo.	1921	Ira Richardson	200	295	32	—	14,600
Adelphi College, Garden City, N. Y.	1896	Paul Dawson Eddy	493	615	53	43,150	34,775
Adrian College, Adrian, Mich.	1845	Samuel J. Harrison	225	415	29	156,000	12,000
Agnes Scott College, Decatur, Ga.	1889	James R. McCain	500	—	65	1,744,000	32,250
Akron, University of, Akron, Ohio	1913	H. E. Simmons	1,511	3,413	106	163,181	58,210
Alabama Polytechnic Inst., Auburn, Ala.	1872	Luther N. Duncan	4,191	6,608	229	40,571	80,000
*Alabama State College for Women, Montevallo, Ala.	1896	A. F. Harman	870	1,418	107	600,000	42,000
Ala. State Teachers College, Florence, Ala.	1872	J. A. Keller	648	1,963	40	—	40,000
Ala. State Teachers Col., Jacksonville, Ala.	1882	Clarence W. Daugette	245	260	57	—	30,000
Ala. State Teachers Col., Livingston, Ala.	1883	N. F. Greenhill	332	529	25	—	25,000
**Ala. State Teachers Col., Montgomery, Ala.	1874	H. C. Trenholm	1,336	2,236	79	—	11,026
Alabama, University of, University, Ala.	1831	George H. Denny	5,258	7,554	471	4,988,665	250,000
Alaska, University of, College, Alaska	1922	Charles E. Bunnell	205	233	35	—	20,000
**Alberta, Univ. of, Edmonton, Alta., Can.	1906	W. A. R. Kerr	1,900	2,754	227	699,671	69,892
Albertus Magnus Col., New Haven, Conn.	1925	Sister M. Uriel	151	314	36	—	16,000
Albion College, Albion, Mich.	1835	John L. Seaton	722	737	52	1,742,392	57,000
Albion State Normal School, Albion, Ida.	1893	Raymond H. Snyder	367	—	30	—	12,269
Albright College, Reading, Pa.	1856	Harry V. Masters	405	539	32	820,000	24,750
Alcorn Agri. & Mech. Col., Alcorn, Miss.	1871	William H. Bell	578	958	65	209,871	12,075
Alderson-Broaddus Col., Philippi, W. Va.	1871	John W. Elliott	128	254	14	45,000	6,800
Alfred University, Alfred, N. Y.	1836	J. Nelson Norwood	550	718	70	1,063,115	60,650
Allegheny College, Meadville, Pa.	1815	William P. Tolley	717	911	59	1,516,457	145,000
Allen University, Columbia, S. C.	1870	Samuel R. Higgins	365	—	23	48,000	4,365
**Alma College, Alma, Mich.	1886	John W. Dunning	405	405	40	700,000	50,000
Alma White College, Zarephath, N. J.	1921	Arthur K. White	24	30	21	—	7,500
American Inter. Col., Springfield, Mass.	1885	Chester S. McGown	617	—	42	—	11,000
American University, Los Angeles, Calif.	1921	Frederick H. Clapp	180	—	9	—	*3,800
American University, Washington, D. C.	1891	Paul F. Douglass	317	1,941	85	947,437	49,340
Amherst College, Amherst, Mass.	1821	Stanley King	870	—	87	12,162,000	232,000
Anderson College, Anderson, S. C.	1911	Annie D. Denmark	361	—	31	—	6,103
Andrew College, Cuthbert, Ga.	1854	S. C. Olliff	105	125	15	50,000	4,600
Antioch College, Yellow Springs, Ohio	1853	A. D. Henderson	747	753	73	228,420	59,587
Appalachian St. Teachers Col., Boone, N.C.	1903	B. B. Dougherty	966	—	54	232,000	24,000
Arizona, University of, Tucson, Ariz.	1885	Alfred Atkinson	2,922	3,560	210	64,656	148,204
Ark. Agri., Mech. & Norm. Col., Pine Bluff	1873	John Brown Watson	446	895	67	—	5,200
*Arkansas Baptist College, Little Rock, Ark.	1884	T. W. Coggs	144	147	15	—	1,272
Arkansas College, Batesville, Ark.	1872	T. M. Lowry, Jr.	109	268	15	70,653	13,000
Arkansas Polytechnic Col., Russellville, Ark.	1909	J. W. Hull	553	658	37	—	14,000
Arkansas State College, Jonesboro, Ark.	1910	V. C. Kays	—	994	44	—	16,000
Arkansas, University of, Fayetteville, Ark.	1872	A. M. Harding	2,502	3,484	164	—	250,000
Aroostook St. Norm. Sch., Presque Isle, Me.	1903	Clifford O. T. Wieden	94	—	19	—	4,500
Asheville College, Asheville, N. C.	1887	Frank C. Foster	249	302	26	—	15,000
Ashland College, Ashland, Ohio	1878	Edward G. Mason	207	560	30	395,950	17,000
Assomption, College de l', L'Assomption, P. Q., Canada	1832	Hervé Lussier	308	—	27	1,189,658	18,600
*Athens College, Athens, Ala.	1843	E. R. Naylor	537	554	31	250,000	14,800
Atlanta University, Atlanta, Ga.	1865	Rufus E. Clement	84	918	34	3,870,521	68,000
Atlantic Christian College, Wilson, N. C.	1902	Howard S. Hilley	370	518	27	359,289	13,725
Atlantic Union Col., So. Lancaster, Mass.	1882	G. Eric Jones	314	490	36	—	16,097
Augsburg Col. & Sem., Minneapolis, Minn.	1869	Bernhard Christensen	396	402	35	73,951	18,854
Augustana College & Theological Seminary, Rock Island, Ill.	1860	Conrad Bergendoff	601	840	60	1,303,317	90,000
Aurora College, Aurora, Ill.	1893	Theodore P. Stephens	204	254	22	80,000	27,500
Austin Peay Norm. Sch., Clarksville, Tenn.	1927	P. P. Claxton	293	356	33	—	12,000
Averett College, Danville, Va.	1859	Curtis V. Bishop	328	393	24	72,000	12,000
Avery Institute, Charleston, S. C.	1865	L. Howard Bennett	500	—	19	—	3,000
B							
Baker University, Baldwin City, Kan.	1858	Nelson P. Horn	327	334	33	1,237,020	66,000
Baldwin-Wallace College, Berea, Ohio	1845	Louis C. Wright	629	806	54	1,813,000	32,000
Ball State Teachers College, Muncie, Ind.	1918	L. A. Pittenger	1,325	2,070	115	—	85,047
Bates College, Lewiston, Me.	1864	Clifton D. Gray	675	869	52	1,992,219	75,000
Baylor University, Waco, Tex.	1845	Pat M. Neff	2,342	2,852	122	1,747,666	90,000
Beaver College, Jenkintown, Pa.	1853	Raymon Kistler	522	593	65	—	20,000
Beckley College, Beckley, W. Va.	1933	D. K. Shroyer	300	550	23	—	8,000
Belhaven College, Jackson, Miss.	1894	G. T. Gillespie	260	330	30	115,000	15,000
*Belmont Abbey College, Belmont, N. C.	1878	Vincent G. Taylor	182	202	31	—	40,000
Beloit College, Beloit, Wis.	1846	Irving Maurer	544	—	54	2,256,209	125,219
Benedict College, Columbia, S. C.	1870	J. J. Starks	525	—	25	140,000	19,000
*Bennett College, Greensboro, N.C.	1873	David D. Jones	331	360	29	354,812	13,096
Bennington College, Bennington, Vt.	1932	Lewis Webster Jones	290	424	50	120,168	20,646
Berea College, Berea, Ky.	1855	Francis S. Hutchins	866	916	78	10,285,533	93,000
Berry College and Schools, Mt. Berry, Ga.	1902	Martha Berry	1,200	—	150	$ —	30,000
Bessie Tift College, Forsyth, Ga.	1847	C. L. McGinty	188	212	22	203,608	13,115
Bethany College, Bethany, W. Va.	1840	W. H. Cramblet	407	416	33	2,351,264	34,000
Bethany College, Lindsborg, Kan.	1881	Emory Lindquist	303	445	38	372,213	20,934
Bethany-Peniel College, Bethany, Okla.	1909	A. K. Bracken	450	477	22	—	8,000
Bethel College, McKenzie, Tenn.	1842	Ewell K. Reagin	124	—	14	425,000	10,500
Bethel College, North Newton, Kan.	1887	Edmund G. Kaufman	274	293	36	340,000	21,500
Bethel Woman's Col., Hopkinsville, Ky.	1854	Kenneth R. Patterson	115	140	16	11,000	6,800
*Bethune-Cookman Col., Daytona Bch., Fla.	1904	Mary McL. Bethune	475	642	19	93,949	8,692
Billings Polytechnic Institute, Billings, Mont.	1908	Ernest T. Eaton	500	1,101	35	400,000	25,000
Biltmore College, Asheville, N. C.	1927	J. J. Stevenson, Jr.	140	173	14	—	16,800
*Birmingham-South. Col., Birmingham, Ala.	1856	Raymond R. Paty	910	1,331	58	590,000	52,000
Bishop College, Marshall, Texas	1881	Joseph J. Rhoads	482	702	34	14,000	17,980
Bishop's University, Lennoxville, Que., Can.	1843	R. A. E. Greenshields	128	141	18	1,187,644	18,000
Black Hills Teachers College, Spearfish, S.D.	1885	E. C. Woodburn	326	873	31	—	18,000
Blackstone Col. for Girls, Blackstone, Va.	1892	J. Paul Glick	213	220	21	—	3,372
*Blinn College, Brenham, Texas	1883	C. F. Schmidt	140	179	12	—	4,000
Bluefield St. Tch. Col., Bluefield, W. Va.	1895	Henry L. Dickason	377	577	23	—	6,000
*Blue Mountain Col., Blue Mountain, Miss.	1873	Lawrence T. Lowrey	278	490	26	296,000	14,040
Blue Ridge College, New Windsor, Md.	1843	Homer E. Cooper	150	—	19	—	*5,000
Bluffton College, Bluffton, Ohio	1900	L. L. Ramseyer	165	219	25	200,000	14,338
Bob Jones College, Cleveland, Tenn.	1927	R. R. (Bob) Jones	550	—	41	—	11,176
Boston College, Chestnut Hill, Mass.	1863	Wm. J. Murphy	2,396	2,930	248	—	178,525
Boston University, Boston, Mass.	1869	Daniel L. Marsh	6,709	12,697	634	5,189,619	210,000
Bourget College, Rigaud, Que., Can.	1850	Father E. Martineau	450	—	64	—	35,800
Bowdoin College, Brunswick, Me.	1794	K. C. M. Sills	623	—	64	8,629,200	186,000
Bowling Green St. Univ., Bowling Green, O.	1910	Frank J. Prout	1,506	2,221	155	—	60,000
Bradley Polytechnic Inst., Peoria, Ill.	1897	Frederic R. Hamilton	836	864	55	2,353,444	52,195
Brenau College, Gainesville, Ga.	1878	H. J. Pearce, Sr.	377	434	44	550,000	19,012
Brescia College, New Orleans, La.	1927	Mother M. Loretto	106	151	19	—	15,473
Brevard College, Brevard, N. C.	1934	E. J. Coltrane	406	434	30	62,000	7,500
Bridgeport City Norm. Sch., Bridge., Conn	1879	Julia Fenton	27	—	11	—	3,960
Bridgewater College, Bridgewater, Va.	1880	Paul H. Bowman	285	—	25	515,257	20,000
Brigham Young University, Provo, Utah.	1875	Franklin S. Harris	2,100	2,550	154	260,000	121,000
British Columbia, Univ. of, Vancouver, B.C.	1915	Leonard S. Klinck	2,503	—	191	102,500	135,000
Brooklyn Polytechnic Inst., Brooklyn, N.Y.	1854	Harry S. Rogers	739	4,167	179	1,694,560	22,400
Brown University, Providence, R. I.	1764	Henry M. Wriston	2,204	2,309	245	11,441,000	589,000
Bryn Mawr College, Bryn Mawr, Pa.	1885	Marion E. Park	576	663	99	7,000,000	175,000
Bucknell University, Lewisburg, Pa.	1846	Arnaud C. Marts	1,298	1,643	89	1,342,896	100,000
Buena Vista College, Storm Lake, Iowa	1891	Henry Olson	430	759	27	300,000	20,000
Buffalo, University of, Buffalo, N. Y.	1846	Samuel P. Capen	1,573	4,619	554	6,000,609	160,000
Butler University, Indianapolis, Ind.	1850	Daniel S. Robinson	1,567	3,608	92	2,805,317	75,000
C							
California Inst. of Tech., Pasadena, Calif.	1891	R. A. Millikan	959	—	219	13,000,000	53,516
*California, University of, Berkeley, Calif.	1868	Robert G. Sproul	28,485	33,493	2382	27,972,280	1,873,564
Calvin College, Grand Rapids, Mich.	1876	Henry Schultze	509	655	25	210,000	26,000
Campbell College, J. P., Jackson, Miss.	1890	S. L. Greene	169	—	13	—	680
Camrose Lutheran College, Camrose, Alberta, Canada	1911	Chester A. Ronning	110	—	6	—	?
Canisius College, Buffalo, N. Y.	1870	Timothy J. Coughlin	667	1,516	61	—	34,120
Capital University, Columbus, Ohio	1850	Otto Mees	751	986	77	608,516	33,450
Carleton College, Northfield, Minn.	1866	Donald J. Cowling	840	858	75	3,662,537	130,835
Carnegie Inst. of Tech., Pittsburgh, Pa.	1900	Robert E. Doherty	2,262	5,320	424	17,160,552	31,000
Carroll College, Helena, Mont.	1910	E. J. Riley	140	252	19	500,000	14,500
Carroll College, Waukesha, Wis.	1846	G. T. Vander Lugt	500	530	32	842,630	21,934
Carson-Newman Col., Jefferson City, Tenn.	1851	James T. Warren	460	—	33	541,000	21,500
Case School of Apld. Sc., Cleveland, Ohio	1880	Wm. E. Wickenden	961	1,977	129	4,500,000	38,500
Catawba College, Salisbury, N. C.	1851	Howard R. Omwake	427	536	37	386,520	18,000
*Catholic Col. of Oklahoma, Guthrie, Okla.	1916	Mother M. A. Arvin	73	—	18	—	8,000
Catholic Univ. of Amer., Washington, D.C.	1887	Joseph M. Corrigan	1,548	4,214	219	1,812,490	306,580
Cedar Crest College, Allentown, Pa.	1868		330	—	36	93,092	22,000
Cedarville College, Cedarville, Ohio	1894	Walter Smith Kilpatrick	100	140	12	200,000	65,000
Centenary College of La., Shreveport, La.	1825	Pierce Cline	547	629	43	491,849	24,520
*Central College, McPherson, Kan.	1914	Orville S. Walters	101	111	23	19,864	7,324
Central College, Fayette, Mo.	1855	Robert H. Ruff	592	727	43	1,153,765	59,000
Central College, Pella, Iowa	1853	Irwin J. Lubbers	335	376	30	300,000	12,000
Central Mich. Col. of Ed., Mt. Pleasant, Mich.	1892	C. L. Anspach	1,030	1,244	88	—	44,147
Central Mo. St. Tch. Col., Warrensburg, Mo.	1871	George W. Diemer	1,200	—	93	—	90,422
Central Normal College, Danville, Ind.	1876	Virgil Hunt	350	650	22	3,000	12,262
Central State College Edmond, Okla.	1890	R. R. Robinson	1,667	1,637	73	—	36,587
Central St. Teachers Col., Stevens Point, Wisconsin	1894	William C. Hansen	556	575	48	—	24,000
Cent. Wash. Col. of Edu., Ellensburg, Wash.	1890	Robert E. McConnell	700	1,127	61	—	34,296
Central Wesleyan Col., Warrenton, Mo.	1864	C. A. Greene	91	121	10	—	18,045
Centre College, Danville, Ky.	1819	Robt. L. McLeod, Jr.	310	355	28	1,770,950	35,000
Chapman College, Los Angeles, Calif.	1920	Cecil F. Cheverton	157	222	22	113,416	14,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Charleston, College of, Charleston, S. C.	1770	Harrison Randolph	342	547	20	$ 459,000	30,230
Chattanooga, Univ. of, Chattanooga, Tenn.	1886	Archie M. Palmer	575	1,042	66	788,743	50,000
Chestnut Hill, Col. of, Philadelphia, Pa.	1871	Mother Mary James	326	592	44	—	26,050
Cheyney St. Tchrs. Col., Cheyney, Pa.	1837	Leslie Pinckney Hill	208	—	27	—	15,000
Chicago, University of, Chicago, Ill.	1891	Robert M. Hutchins	11,897	16,267	873	72,502,175	1,337,860
Chico State College, Chico, Calif.	1887	Aymer Jay Hamilton	700	900	52	—	26,000
Christian College, Columbia, Mo.	1851	James C. Miller	300	304	33	—	10,083
Cincinnati, University of, Cincinnati, Ohio	1819	Raymond Walters	3,954	11,679	709	9,689,559	511,974
Citadel, The, Charleston, S. C.	1842	C. P. Summerall	1,762	—	92	—	27,000
Claflin College, Orangeburg, S. C.	1869	Joseph B. Randolph	181	—	16	160,000	11,262
Claremont Colleges, Claremont, Calif.	1925	Russell M. Story	96	600	90	929,096	41,468
Clark University, Worcester, Mass.	1887	Wallace W. Atwood	313	595	38	5,000,000	166,000
Clarke College, Dubuque, Iowa	1843	Mary Ambrose Mulholland	327	537	48	—	20,000
Clarkson College of Tech., Potsdam, N. Y.	1896	John A. Ross, Jr.	600	—	30	1,427,437	10,466
Cleary College, Ypsilanti, Mich.	1883	Owen J. Cleary	—	524	21	—	7,000
Clemson Agri. Col., Clemson, S. C.	1893	Robert Franklin Poole	2,296	2,604	157	—	56,000
Clinton Norm.& Indus.Col.,Rock Hill,S.C.	1894	E. W. Brice	161	201	11	—	10,000
Coe College, Cedar Rapids, Iowa	1881	C. H. Geiger	710	738	65	1,676,505	55,000
Coker College, Hartsville, S. C.	1894	C. Sylvester Green	281	372	32	750,000	20,000
Colby College, Waterville, Me.	1820	Franklin W. Johnson	681	695	57	2,964,065	100,000
Colgate University, Hamilton, N. Y.	1819	George B. Cutten	1,007	—	103	5,755,809	125,000
College Catholique, Le, Gravelbourg, Sask., Can.	1918	Aimé Lizée	85	—	15	—	7,500
Colorado College, Colorado Springs, Colo.	1874	Thurston J. Davies	828	1,024	68	2,700,000	122,000
Colorado School of Mines, Golden, Colo.	1874	M. F. Coolbaugh	839	—	73	—	50,300
Colorado State College of Agriculture and Mechanic Arts, Fort Collins, Colo.	1870	Roy M. Green	1,834	2,913	163	—	100,000
Colorado St. Col. of Edu., Greeley, Colo.	1890	George W. Frasier	2,182	2,276	108	—	84,140
Colorado, University of, Boulder, Colo.	1876	Robert L. Stearns	7,654	—	312	395,892	431,755
Colorado Woman's College, Denver, Colo	1888	J. E. Huchingson	365	—	38	101,000	7,000
Columbia College, Columbia, S. C.	1854	J. Caldwell Guilds	347	—	30	485,000	15,000
Columbia University, New York, N. Y.	1754	Nicholas M. Butler	—	30,197	3289	89,050,717	1,763,855
Concord State Tch. Col., Athens, W. Va.	1872	Joseph Franklin Marsh	585	1,035	40	—	18,950
Concordia College, Moorhead, Minn.	1891	J. N. Brown	530	532	48	539,220	26,870
Concordia Theol. Seminary, St. Louis, Mo.	1839	L. E. Fuerbringer	385	409	18	—	35,000
Concordia Teachers Col., River Forest, Ill.	1864	Arthur W. Klinck	365	505	26	100,000	12,000
Concordia Teachers Col., Seward, Neb.	1894	A. O. Fuerbringer	153	228	15	—	7,721
Connecticut, University of, Storrs, Conn.	1881	Albert N. Jorgensen	1,704	2,442	222	306,286	66,000
Connecticut College, New London, Conn.	1911	Katharine Blunt	755	815	101	1,542,843	91,167
Conn. Teachers Col., New Britain, Conn.	1849	Herbert D. Welte	420	440	37	—	20,000
Converse College, Spartanburg, S. C.	1889	Edw. M. Gwathmey	394	463	42	630,320	29,854
Cooper Union, New York, N. Y.	1859	Gano Dunn	2,681	—	154	7,228,975	100,500
Cornell College, Mount Vernon, Iowa	1853	John B. Magee	623	682	52	2,342,780	60,000
Cornell University, Ithaca, N. Y.	1865	Edmund Ezra Day	6,908	8,569	1207	33,871,539	1,094,117
Cortland State Normal Sch., Cortland, N.Y.	1866	H. DeW. DeGroat	470	640	44	—	28,000
Creighton University, Omaha, Neb.	1878	Jos. P. Zuercher	1,393	1,939	275	3,000,000	120,000
Culver-Stockton Col., Canton, Mo.	1853	W. H. McDonald	275	340	23	1,019,993	27,000
*Cumberland University, Lebanon, Tenn.	1842	Ernest L. Stockton	350	500	25	150,000	15,000
D							
Dakota Wesleyan Univ., Mitchell, S. D.	1885	Joseph H. Edge	400	—	32	640,000	27,910
*Dalhousie Univ., Halifax, N. S., Canada	1818	Carleton Stanley	—	779	158	2,670,670	62,271
Dana Col.and Trinity Theol.Sem.,Blair,Neb.	1884	Lawrence Siersbeck	164	212	19	172,000	11,000
Danbury State Tch. Col., Danbury, Conn.	1904	Ralph C. Jenkins	225	425	40	—	18,000
Daniel Baker College, Brownwood, Texas	1889	Thomas H. Hart	304	527	22	181,000	11,000
Dartmouth College, Hanover, N. H.	1769	Ernest M. Hopkins	2,426	—	274	19,526,934	527,801
Davidson College, Davidson, N. C.	1837	John R. Cunningham	683	—	46	2,250,000	42,000
Davis & Elkins College, Elkins, W. Va.	1904	R. T. L. Liston	161	305	15	186,000	17,500
Dayton, University of, Dayton, Ohio	1850	John A. Elbert	655	1,701	90	—	37,425
Defiance College, Defiance, Ohio	1885	John Wilbert Claxton	380	—	28	300,000	30,000
Delaware, University of, Newark, Del.	1833	Walter Hullihen	857	1,164	162	558,896	88,111
Delta State Tch. Col., Cleveland, Miss.	1924	William M. Kethley	277	282	34	—	20,000
Denison University, Granville, Ohio	1831	Kenneth I. Brown	900	921	70	3,238,511	145,000
Denver, Univ. of, Denver, Colo.	1864	Caleb F. Gates, Jr.	2,690	5,596	310	2,650,507	137,739
DePaul University, Chicago, Ill.	1898	M. J. O'Connell	2,288	6,697	161	—	72,500
DePauw University, Greencastle, Ind.	1837	Clyde E. Wildman	1,453	1,477	101	6,234,018	96,934
De Sales College, Toledo, Ohio	1936	Raymond G. Kirsch	266	1,064	51	—	26,440
Detroit Inst. of Tech., Detroit, Mich.	1891	Paul Hickey	1,608	2,270	105	—	9,000
Detroit, University of, Detroit, Mich.	1877	Charles H. Cloud	2,571	4,451	219	1,640,000	105,000
Dickinson College, Carlisle, Pa.	1773	Fred P. Corson	502	503	40	1,411,947	66,000
Dillard University, New Orleans, La.	1930	A. W. Dent	240	292	23	—	23,375
Doane College, Crete, Neb.	1872	Bryan S. Stoffer	236	239	28	908,276	29,055
Drake University, Des Moines, Iowa	1881	Henry Gadd Harmon	1,754	2,298	120	1,804,944	91,935
Drew University, Madison, N. J.	1867	Arlo Ayres Brown	—	472	41	5,933,685	186,620
Drexel Inst. of Tech., Philadelphia, Pa.	1891	Parke R. Kolbe	1,840	4,965	129	3,000,000	73,000
Dropsie College, Philadelphia, Pa.	1907	Abraham A. Neuman	52	—	7	800,000	48,000
Drury College, Springfield, Mo.	1873	J. F. Findlay	395	438	33	$ 1,200,000	59,418
Dubuque, University of, Dubuque, Iowa	1852	Dale D. Welch	444	624	37	736,543	24,809
Duchesne College, Omaha, Neb.	1881	Mother Helen Casey	130	—	19	—	15,000
*Duke University, Durham, N. C.	1838	Robert Lee Flowers	3,716	5,499	476	34,397,616	600,235
Duluth State Tch. Col., Duluth, Minn.	1895	Herbert Sorenson	496	967	49	—	29,141
Duquesne University, Pittsburgh, Pa.	1878	Raymond V. Kirk	1,052	1,689	197	—	54,650
D'Youville College, Buffalo, N. Y.	1908	Sister Grace	300	—	30	—	21,000
E							
Earlham College, Richmond, Ind.	1847	Wm. C. Dennis	415	438	40	$ 1,328,950	62,000
East Carolina Tch. Col., Greenville, N. C.	1907	Leon R. Meadows	1,241	1,760	98	—	44,331
*East Central State College, Ada, Okla.	1909	A. Linscheid	924	1,937	61	—	24,101
Eastern Ill. St. Tch. Col., Charleston, Ill.	1895	Robert G. Buzzard	915	1,585	91	—	58,520
Eastern Ky. St. Tch. Col., Richmond, Ky.	1906	W. F. O'Donnell	—	981	82	—	65,000
Eastern Mont. St. Norm.Sch.,Billings,Mont.	1927	L. B. McMullen	311	498	21	—	11,800
*Eastern Nazarene Col., Wollaston, Mass.	1918	G. B. Williamson	218	—	20	—	10,000
Eastern Oregon College of Education, La Grande, Ore.	1929	Roben J. Maaske	293	323	35	—	17,083
Eastern State Norm. Sch., Castine, Me.	1867	William D. Hall	41	—	12	—	6,600
Eastern Wash. Col. of Ed., Cheney, Wash.	1890	Ralph E. Tieje	1,462	1,547	62	—	43,690
Edmonton Jesuit Col.,Edmonton,Alta.,Can.	1913	Joseph Fortier	108	—	16	—	10,600
Elizabethtown Col., Elizabethtown, Pa.	1899	A. C. Baugher	150	250	18	180,000	13,000
Elmhurst College, Elmhurst, Ill.	1871	Timothy Lehmann	344	366	30	—	36,600
Elmira College, Elmira, N. Y.	1855	William S. A. Pott	254	258	51	846,745	51,192
Elon College, Elon College, N. C.	1888	Leon E. Smith	585	673	29	484,138	26,724
Emerson College, Boston, Mass.	1880	Harry Seymour Ross	155	343	27	—	10,465
Emmanuel College, Boston, Mass.	1919	Sister Teresa Patricia	530	—	54	—	26,000
Emmanuel Col., Saskatoon, Sask., Canada	1879	Rev. S. C. Steer	23	—	3	—	5,000
Emmanuel Miss.Col. Berrien Spgs., Mich.	1901	Henry J. Klooster	342	570	29	300,000	26,433
Emory and Henry College, Emory, Va.	1836	Foye G. Gibson	214	295	16	314,675	22,000
Emory University, Emory, Ga.	1836	Harvey W. Cox	1,208	1,737	278	5,000,000	191,136
Emporia, College of, Emporia, Kan.	1882	D. A. Hirschler	207	—	28	150,000	30,000
Erskine College, Due West, S. C.	1839	Robert C. Grier	264	285	28	362,393	26,000
Evangelical Theological Seminary, Naperville, Ill.	1873	H. R. Heininger	81	—	7	517,254	9,422
Evansville College, Evansville, Ind.	1854	Lincoln B. Hale	395	1,078	56	400,000	20,315
F							
Fairmont St. Tch. Col., Fairmont, W. Va.	1867	John W. Pence and Oliver Shurtleff	944	1,230	44	—	34,463
**Fayetteville State Tch. Col., Fayetteville, N. C.	1877	J. W. Seabrook	614	614	22	—	12,892
Fenn College, Cleveland, Ohio	1881	Cecil V. Thomas	858	3,730	196	789,060	16,987
Ferris Institute, Big Rapids, Mich.	1884	Merle S. Ward	652	866	30	25,000	11,000
Findlay College, Findlay, Ohio	1882	H. R. Dunathan	286	345	22	458,035	21,000
Fisk University, Nashville, Tenn.	1866	Thomas E. Jones	412	645	53	2,950,404	77,543
Fletcher Col., John, Univ. Pk., Ia.	1905	Charles W. Butler	151	—	16	15,000	15,000
Fla. Agri. & Mech. Col., Tallahassee, Fla.	1887	J. R. E. Lee	866	—	89	—	14,684
Florida Southern College, Lakeland, Fla.	1885	Ludd M. Spivey	780	1,180	64	528,000	24,000
Fla. State Col. for Women, Tallahassee, Fla.	1905	Doak S. Campbell	1,952	3,321	185	206,000	89,114
Florida, University of, Gainesville, Fla.	1853	John J. Tigert	3,095	—	214	290,503	176,279
Fordham University, New York, N. Y.	1841	Robert I. Gannon	3,230	7,392	465	475,000	211,450
Fort Hays Kansas State College, Hays, Kansas	1902	Lyman Dwight Wooster	1,000	1,932	82	—	48,200
Franklin & Marshall Col., Lancaster, Pa.	1787	Theodore August Distler	839	854	49	1,334,342	85,000
Franklin College of Ind., Franklin, Ind.	1834	William G. Spencer	330	350	32	795,063	31,339
Franklin University, Columbus, Ohio	1902	Raymond A. Witchey	82	670	44	—	9,759
Fresno State College, Fresno, Calif.	1911	Frank W. Thomas	1,941	2,225	103	—	46,186
Friends University, Wichita, Kan.	1898	W. A. Young	385	565	26	560,000	21,475
Furman University, Greenville, S. C.	1826	John Laney Plyler	965	1,402	71	801,222	40,000
G							
Gallaudet College, Washington, D. C.	1864	Percival Hall	143	—	20	—	10,000
Geneva College, Beaver Falls, Pa.	1841	M. M. Pearce	406	606	36	635,000	35,000
Geo. Peabody Col. for Tch., Nashville, Tenn.	1875	Sidney C. Garrison	5,128	5,543	183	5,543,000	150,000
Georgetown College, Georgetown, Ky.	1829	Henry N. Sherwood	250	348	33	587,000	16,000
*Georgetown Univ., Washington, D. C.	1789	Arthur A. O'Leary	2,505	—	670	—	200,000
*Geo. Washington Univ., The, Washington, D. C.	1821	Cloyd H. Marvin	2,023	8,720	421	2,355,137	125,000
George Williams College, Chicago, Ill.	1890	Harold Coe Coffman	—	326	34	217,662	17,300
George Williams Col., Sir, Montreal, Can.	1873	K. E. Norris	625	3,000	100	—	10,000
Georgia Sch. of Technology, Atlanta, Ga.	1885	Marion L. Brittain	2,835	—	192	550,000	52,336
Georgia State Col., Industrial College, Ga.	1891	Benjamin F. Hubert	515	1,142	50	—	8,000
Ga. State Col. for Women, Milledgeville, Ga.	1889	Guy H. Wells	1,189	2,203	102	—	35,000
Ga. State Womans Col., Valdosta, Ga.	1906	Frank R. Reade	316	—	25	—	16,905
Georgia, University of, Athens, Ga.	1785	Harmon W. Caldwell	3,631	4,916	254	759,972	154,565

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Gettysburg College, Gettysburg, Pa.	1832	Henry W. A. Hanson	650	715	45	$ 815,000	59,000
Glenville St. Tch. Col., Glenville, W. Va.	1872	Edward G. Rohrbough	415	737	26	—	18,000
Gonzaga University, Spokane, Wash.	1887	Leo J. Robinson	620	815	58	—	42,357
Gorham Normal School, Gorham, Me.	1879	Francis L. Bailey	308	—	34	—	9,000
Goshen College, Goshen, Ind.	1894	Ernest Edgar Miller	255	338	28	123,188	20,500
Goucher College, Baltimore, Md.	1888	David A. Robertson	549	576	88	2,461,238	74,185
Graceland College, Lamoni, Iowa	1895	G. N. Briggs	345	—	25	250,000	18,000
Grand Rapids, University of, Grand Rapids, Mich.	1936	Paul F. Voelker	400	600	24	—	6,000
Grand Séminaire Mazenod, Gravelbourg, Saskatchewan, Canada	1931	A. M. Josse	16	—	4	—	300
*Great Falls, Col. of, Great Falls, Mont.	1932	Sister Lucia	350	450	39	—	10,500
Greensboro College, Greensboro, N. C.	1838	Luther L. Gobbel	384	443	35	467,054	21,592
Greenville College, Greenville, Ill.	1892	H. J. Long	220	310	20	125,000	13,000
Grinnell College, Grinnell, Iowa	1846	Samuel N. Stevens	651	—	72	—	111,144
Grove City College, Grove City, Pa.	1876	Weir C. Ketler	879	929	54	847,199	39,000
Guilford College, Guilford College, N. C.	1837	Clyde A. Milner	350	413	30	600,965	22,875
Gustavus Adolphus Col., St. Peter, Minn.	1862	O. J. Johnson	527	—	32	565,000	29,730
H							
Hamilton College, Clinton, N. Y.	1812	W. H. Cowley	455	—	48	4,200,342	191,943
Hamline University, St. Paul, Minn.	1854	Charles Nelson Pace	600	—	45	1,962,283	41,600
Hampden-Sydney Col., Hamp.-Sydney, Va.	1775	E. G. Gammon	380	—	22	378,784	18,000
Hampton Institute, Hampton, Va.	1868	Malcolm S. MacLean	1,006	1,628	140	9,828,553	62,000
Hannibal-LaGrange Col., Hannibal, Mo.	1857	A. E. Prince	143	151	20	50,000	6,985
Hanover College, Hanover, Ind.	1827	Albert G. Parker, Jr.	351	—	27	1,361,468	40,000
Harding College, Searcy, Ark.	1924	George S. Benson	523	574	36	25,500	18,000
Hardin-Simmons Univ., Abilene, Tex.	1891	W. R. White	800	1,250	52	1,500,000	27,000
Harris Teachers College, St. Louis, Mo.	1905	William N. Sellman	641	—	37	—	18,342
Hartwick College, Oneonta, N. Y.	1928	H. J. Arnold	257	336	28	114,890	20,000
Harvard University, Cambridge, Mass.	1636	James B. Conant	7,243	9,939	2043	154,140,303	4,265,792
Hastings College, Hastings, Neb.	1882	John W. Creighton	408	675	38	722,431	30,200
Haverford College, Haverford, Pa.	1833	Felix Morley	348	—	50	4,350,000	150,000
Hawaii, University of, Honolulu, Hawaii	1907	David L. Crawford	1,881	2,420	197	34,923	142,847
Hebrew Union College, Cincinnati, Ohio	1875	Julian Morgenstern	48	60	22	2,500,000	100,000
Heidelberg College, Tiffin, Ohio	1850	Clarence E. Josephson	412	444	37	975,686	32,775
Henderson St. Tch. Col., Arkadelphia, Ark.	1890	Matt L. Ellis	430	906	45	—	19,491
Hendrix College, Conway, Ark.	1884	John Hugh Reynolds	358	—	40	1,046,837	42,500
Hesston Col. & Bible Sch., Hesston, Kan.	1908	Milo F. Kauffman	185	190	12	35,000	5,500
High Point College, High Point, N. C.	1924	Gideon I. Humphreys	463	624	38	—	13,940
Hillman College, Clinton, Miss.	1853	M. P. Lowrey Berry	100	103	13	—	4,000
Hillsdale College, Hillsdale, Mich.	1844	Willfred O. Mauck	310	337	40	786,498	27,500
Hiram College, Hiram, Ohio	1850	Paul H. Fall	255	—	27	1,112,092	38,250
Hiwassee College, Madisonville, Tenn.	1849	Thomas A. Frick	225	265	16	67,000	5,026
Hobart College, Geneva, New York	1822	William Alfred Eddy	297	298	54	1,402,882	110,375
Hollins College, Hollins College, Va.	1842	Bessie C. Randolph	335	339	41	—	34,034
Holy Cross, Col. of the, Worcester, Mass.	1843	Joseph R. N. Maxwell	1,222	1,228	81	96,375	125,000
Holy Heart Seminary, Halifax, N.S., Can.	1895	Julien Deville	54	—	8	60,000	9,000
Holy Names, Col. of the, Oakland, Calif.	1868	Sister Mary Loyola	295	602	45	—	22,100
Holy Names College, Spokane, Wash.	1907	M. Elizabeth Clare	150	268	27	—	13,000
Hood College, Frederick, Md.	1893	Henry I. Stahr	439	447	54	400,007	22,500
Hope College, Holland, Mich.	1866	W. Wichers	549	—	40	1,960,000	36,000
Houghton College, Houghton, N. Y.	1883	Stephen W. Paine	421	433	37	256,271	18,200
Houston, University of, Houston, Texas	1927	Edison E. Oberholtzer	652	2,809	83	—	17,428
Howard College, Birmingham, Ala.	1842	Harwell G. Davis	648	1,076	54	750,000	32,000
Howard Payne College, Brownwood, Tex.	1889	Thomas H. Taylor	780	943	35	541,200	24,500
Howard University, Washington, D.C.	1867	M. W. Johnson	1,376	2,319	240	985,913	142,257
Hunter College, New York, N. Y.	1870	George N. Shuster	7,000	13,770	713	—	132,445
Huntingdon College, Montgomery, Ala.	1854	Hubert Searcy	408	558	45	400,000	17,500
Huntington College, Huntington, Ind.	1897	Elmer Becker	117	134	17	100,000	14,000
Huron College, Huron, S. D.	1883	George F. McDougall	269	301	26	802,453	23,034
I							
Idaho, The College of, Caldwell, Ida.	1891	William W. Hall, Jr.	300	431	29	525,000	18,000
Ida., So. Brnch. of the Univ. of, P'c'tello, Ida.	1901	John R. Nichols	1,000	1,200	85	—	20,000
Idaho, University of, Moscow, Ida.	1889	Harrison C. Dale	2,360	2,981	176	3,191,415	100,000
Illinois College, Jacksonville, Ill.	1829	H. Gary Hudson	340	344	26	1,131,557	36,333
Illinois Institute of Technology, Chicago, Ill. (formerly Armour Institute [1892] and Lewis Institute [1896])	1940	H. T. Heald	2,274	7,899	250	2,000,000	100,000
Illinois State Normal Univ., Normal, Ill.	1857	R. W. Fairchild	1,621	3,301	201	—	78,000
Illinois, University of, Urbana, Ill.	1868	Arthur C. Willard	12,605	17,392	2025	1,378,807	1,262,046
Ill. Wesleyan Univ., Bloomington, Ill.	1850	William E. Shaw	706	726	62	1,263,885	43,000
ImmaculateConc.Sem.Huntington,L.I.N.Y.	1926	Patrick J. Barry	192	—	19	—	25,000
*Immaculate Heart Col., Los Angeles, Calif.	1906	Sister M. Eucharia	508	—	40	52,000	18,000
*Incarnate Word Col., San Antonio, Tex.	1900	Sister M. Columkille	406	865	48	330,000	31,000
Indiana Central Col., Indianapolis, Ind.	1902	I. J. Good	418	—	25	64,681	13,375
Indiana State Tch. Col., Indiana, Pa.	1875	LeRoy A. King	1,240	1,992	120	$ —	22,000
Ind. State Tch. Col., Terre Haute, Ind.	1870	Ralph Noble Tirey	1,342	1,764	126	—	141,702
Indiana University, Bloomington, Ind.	1820	Herman B. Wells	6,158	7,883	402	2,579,029	400,000
Int.Y.M.C.A.Col., Springfield, Mass.	1885	Ernest M. Best	588	925	56	1,081,103	27,324
Iowa State College, Ames, Iowa	1858	Charles E. Friley	6,099	7,357	665	—	310,000
*Iowa State Tch. Col., Cedar Falls, Iowa	1876	Malcolm Price	3,415	3,491	163	—	135,404
Iowa, State University of, Iowa City, Ia.	1847	Virgil Hancher	6,115	6,342	650	1,052,847	505,700
Iowa Wesleyan Col., Mt. Pleasant, Ia.	1842	Stanley B. Niles	323	331	29	701,860	34,000
Ithaca College, Ithaca, N. Y.	1892	Leonard B. Job	543	705	60	2,200	5,100
J							
Jacksonville College, Jacksonville, Tex.	1899	C. R. Meadows	40	60	6	50,000	5,000
James Millikin University, Decatur, Ill.	1901	John C. Hessler	635	688	50	1,010,152	33,846
James Ormond Wilson Tch. Col., Wash., D.C.	1873	Walter E. Hager	450	—	47	—	30,000
Jamestown College, Jamestown, N. D.	1883	B. H. Kroeze	316	361	33	1,074,032	18,000
Jean-de-Brébeuf, Collège, Montreal, Que., Can.	1928	Antonio Dragon	563	—	50	—	13,000
John B. Stetson University, De Land, Fla.	1883	William S. Allen	798	852	70	850,000	45,000
John Brown Univ., Siloam Springs, Ark.	1919	John E. Brown	314	494	32	—	10,000
John Carroll University, Cleveland, Ohio	1886	Edmund C. Horne	545	725	49	2,500,000	33,433
Johns Hopkins Univ., Baltimore, Md.	1876	Isaiah Bowman	2,510	4,860	798	30,907,474	448,070
Johnson C. Smith Univ., Charlotte, N. C.	1867	Henry L. McCrorey	458	744	34	1,721,700	23,648
Judson College, Marion, Ala.	1838	Leroy R. Priest	193	—	26	523,269	16,284
Juniata College, Huntingdon, Pa.	1876	Charles C. Ellis	381	479	41	714,263	50,000
K							
Kalamazoo College, Kalamazoo, Mich.	1833	Paul L. Thompson	413	—	33	1,300,066	32,063
Kan. State Col., Manhattan, Kan.	1863	Francis D. Farrell	4,100	4,600	350	505,509	129,555
Kan. St. Tch. Col., Emporia, Kan.	1863	Thomas W. Butcher	1,226	—	125	250,000	82,766
Kan. State Teachers Col., Pittsburg, Kan.	1903	Rees H. Hughes	1,538	2,766	118	—	48,141
Kansas, University of, Lawrence, Kan.	1865	Deane W. Malott	4,300	5,000	255	256,000	331,000
Kansas Wesleyan University, Salina, Kan.	1886	Edgar K. Morrow	280	409	30	468,955	14,000
Keene Teachers College, Keene, N. H.	1909	L. P. Young	362	588	50	—	18,000
Kemptville Agricultural School, Kemptville, Ont., Can.	1917	M. C. McPhail	70	150	11	—	800
*Kent State University, Kent, Ohio	1910	K. C. Leebrick	2,272	4,432	149	—	65,378
Ky. State Col. for Negroes, Frankfort, Ky.	1886	Rufus B. Atwood	460	596	49	—	15,000
Kentucky, Univ. of, Lexington, Ky.	1865	Herman Lee Donovan	3,250	4,847	339	184,075	302,889
Kentucky Wesleyan Col., Winchester, Ky.	1866	Paul Shell Powell	145	207	18	71,949	16,531
Kenyon College, Gambier, Ohio	1824	Gordon K. Chalmers	322	323	41	1,800,000	65,000
Keuka College, Keuka Park, N. Y.	1890	Henry E. Allen	223	226	26	321,234	20,632
King College, Bristol, Tenn.	1867	Thomas P. Johnston	242	286	16	140,000	13,000
King's College, Univ. of, Halifax, N.S., Can.	1789	A. S. Walker	36	—	11	1,250,000	25,000
Knox College, Galesburg, Ill.	1837	Carter Davidson	620	626	57	2,545,985	60,900
Knox College, Toronto, Ont., Canada	1844	Rev. Thomas Eakin	34	—	4	387,013	35,000
Knoxville College, Knoxville, Tenn.	1875	John A. Cotton	370	376	22	600,000	12,000
*Kutztown State Tch. Col., Kutztown, Pa.	1866	Q. A. W. Rohrbach	500	800	37	—	15,250
L							
La Crosse State College, La Crosse, Wis.	1909	Rexford S. Mitchell	665	1,037	59	—	30,222
Lafayette College, Easton, Pa.	1826	William M. Lewis	900	—	97	4,000,000	100,000
LaGrange College, LaGrange, Ga.	1831	Hubert T. Quillian	165	210	20	360,000	12,000
Lake Erie College, Painesville, Ohio	1856	Helen D. Bragdon	195	197	30	822,045	29,825
Lake Forest College, Lake Forest, Ill.	1857	Herbert M. Moore	313	323	30	1,346,600	51,500
Lamar College, Beaumont, Tex.	1923	John E. Gray	581	1,625	28	—	4,277
Lambuth College, Jackson, Tenn.	1924	R. E. Womack	155	—	19	—	6,000
Lander College, Greenwood, S. C.	1872	John Marvin Rast	341	411	36	334,827	16,000
Lane College, Jackson, Tenn.	1882	James F. Lane	461	782	24	30,000	10,500
Langston University, Langston, Okla.	1897	G. L. Harrison	562	700	76	—	8,892
Laval University, Quebec, Canada	1852	Camille Roy	3,519	3,905	341	2,500,000	532,000
LaVerne College, LaVerne, Calif.	1891	C. Ernest Davis	172	181	20	50,155	10,707
Lawrence College, Appleton, Wis.	1847	Thomas N. Barrows	701	718	76	1,520,500	65,159
Lebanon Valley College, Annville, Pa.	1866	Clyde A. Lynch	352	649	35	919,670	24,083
Lehigh University, Bethlehem, Pa.	1865	Clement C. Williams	1,748	2,348	195	6,901,207	248,165
Leland College, Baker, La.	1870	John A. Bacoats	325	505	22	120,000	48,050
LeMoyne College, Memphis, Tenn.	1870	Fred L. Brownlee	319	471	29	—	14,793
Lenoir-Rhyne College, Hickory, N. C.	1891	P. E. Monroe	580	589	34	600,000	17,000
Lesley Normal School, Cambridge, Mass.	1909	Edith L. Wolfard	96	—	24	—	3,000
Lévis, Collège de, Lévis, Province de Quebec, Canada	1853	Léopold Roberge	750	—	70	—	30,000
Lewiston State Norm. Sch., Lewiston, Ida.	1893	Glenn W. Todd	493	509	30	—	16,000
Limestone College, Gaffney, S. C.	1845	R. C. Granberry	365	—	37	500,000	20,630
Lincoln College, Lincoln, Ill.	1865	William D. Copeland	120	130	15	250,000	10,000
Lincoln Institute, Lincoln Ridge, Ky.	1910	Walter K. Belknap	267	—	14	221,548	5,030
Lincoln Memorial Univ., Harrogate, Tenn.	1890	S. W. McClelland	336	496	31	830,020	18,000
Lincoln University, Jefferson City, Mo.	1866	Sherman D. Scruggs	692	1,095	77	—	20,171
Lincoln University, Lincoln Univ., Pa.	1854	Walter L. Wright	368	—	28	1,012,590	36,500

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Lindenwood College, St. Charles, Mo.	1827	Harry Morehouse Gage	455	—	47	$ 2,021,138	25,030
Linfield College, McMinnville, Ore.	1857	Wm. G. Everson	421	445	36	920,000	27,852
Livingstone College, Salisbury, N. C.	1879	William J. Trent	211	312	19	46,500	17,550
Long Island University, Brooklyn, N. Y.	1926	Tristram W. Metcalfe	1,248	1,451	65	500,000	17,200
*Lon Morris College, Jacksonville, Tex.	1872	C. E. Peeples	268	300	14	100,961	6,723
Loras College, Dubuque, Iowa	1839	M. J. Martin	461	1,275	73	1,200,000	82,000
Loretto Heights College, Loretto, Colo.	1891	Paul J. Ketrick	224	278	30	—	15,400
Louisburg College, Louisburg, N. C.	1779	Walter Patten	296	301	23	61,000	6,578
Louisiana College, Pineville, La.	1906	H. M. Weathersby	363	451	22	309,000	13,000
Louisiana Polytechnic Inst., Ruston, La.	1894	Claybrook Cottingham	1,707	2,566	122	—	22,000
La. State Norm. Col., Natchitoches, La.	1884	Joe Farrar	1,190	—	122	—	35,000
Louisiana State Univ., University Station, Baton Rouge, La.	1860	C. B. Hodges	6,765	9,530	603	14,555	293,871
Lowell Textile Institute, Lowell, Mass.	1895	Charles H. Eames	290	1,316	40	—	2,915
Loyola College, Baltimore, Md.	1852	Edward B. Bunn	405	—	33	1,375,000	31,500
Loyola College, Montreal, Que. Can.	1897	Edward M. Brown	463	—	27	—	16,000
Loyola University, Chicago, Ill.	1870	Samuel K. Wilson	4,529	5,621	788	1,390,485	121,040
Loyola University, Los Angeles, Calif.	1865	Chas. A. McQuillan	620	730	57	—	34,500
Loyola Univ. of the South, New Orleans, La.	1904	Percy A. Roy	956	2,205	186	4,717,568	95,517
Lutheran College and Seminary, The Saskatoon, Saskatchewan, Canada	1913	N. Willison	13	16	5	2,200	9,110
Luther College, Decorah, Iowa	1861	O. J. H. Preus	440	497	40	559,192	70,000
Lynchburg College, Lynchburg, Va.	1903	R. B. Montgomery	228	287	23	289,332	18,237
M							
Macalester College, St. Paul, Minn.	1885	Charles J. Turck	630	—	57	1,973,413	33,500
MacMurray College, Jacksonville, Ill.	1846	C. P. McClelland	635	776	56	3,834,759	21,353
McGill University, Montreal, Canada	1821	F. Cyril James	3,074	3,263	589	21,029,429	428,927
McKendree College, Lebanon, Ill.	1828	Clark R. Yost	179	219	22	300,000	10,000
McMaster Univ., Hamilton, Ont., Can.	1887	George P. Gilmour	584	1,049	43	1,700,000	53,000
McMurry College, Abilene, Texas	1921	Frank L. Turner	410	565	34	60,000	13,500
McPherson College, McPherson, Kan.	1887	W. W. Peters	270	369	33	424,400	15,000
Madawaska Tr. Sch., Fort Kent, Me.	1878	R. F. Crocker	107	—	9	—	5,500
Madison College, Madison College, Tenn.	1904	E. A. Sutherland	325	—	26	500,000	23,000
Maine, University of, Orono, Me.	1865	Arthur A. Hauck	1,974	2,497	190	1,013,539	185,000
Manchester College, No. Manchester, Ind.	1889	Vernon F. Schwalm	655	1,122	43	612,238	34,918
Manhattan College, New York, N. Y.	1863	Brother A. Victor	1,540	1,820	130	—	55,000
Manhattanville Col. of Sac. Hrt., N. Y.	1841	Grace C. Dammann	372	640	72	346,726	42,083
Manitoba, The University of, Winnipeg, Manitoba, Canada	1877	Sidney Earle Smith	2,513	3,488	227	833,226	104,914
Mansfield State Tch. Col., Mansfield, Pa.	1858	Willis E. Pratt	472	631	65	—	21,000
*Marian College, Indianapolis, Indiana	1936	Sister Mary John	91	280	32	—	15,000
Marietta College, Marietta, Ohio	1797	Harry Kelso Eversull	318	325	38	1,274,861	119,056
Marion College, Marion, Ind.	1920	Wm. F. McConn	200	300	18	100,000	16,000
Marion College, Marion, Virginia	1873	Hugh J. Rhyne	110	140	17	—	7,500
Marquette University, Milwaukee, Wis.	1881	R. C. McCarthy	3,564	5,311	432	2,042,546	128,322
*Marshall, The College of, Marshall, Tex.	1912	F. S. Groner	360	415	20	—	9,320
Martin Luther Col., New Ulm, Minn.	1884	Carl L. Schweppe	212	—	13	—	10,000
Mary Baldwin College, Staunton, Va.	1842	L. Wilson Jarman	321	330	31	598,900	26,300
Marygrove College, Detroit, Mich.	1910	Sister M. Honora	642	1,393	69	—	33,436
Mary Hardin-Baylor College, Belton, Tex.	1845	Gordon G. Singleton	401	653	48	936,000	25,216
Maryland Col. for Women, Lutherville, Md.	1853	Wm. H. Moore, III	170	—	16	—	10,000
Maryland State Teachers College, Bowie, Maryland	1908	Leonidas S. James	155	—	17	—	8,081
Maryland, Univ. of, College Park, Md.	1807	H. C. Byrd	4,975	7,024	936	1,915,000	135,000
Marylhurst Normal Sch., Marylhurst, Ore.	1911	Sister M. F. Josephine	79	239	15	—	26,000
Marymount College, Salina, Kan.	1922	Mother Chrysostom	168	412	27	—	17,500
Marymount College, Tarrytown, N. Y.	1907	M. Gerard	263	—	49	1,000,000	28,000
*Maryville College, Maryville, Tenn.	1819	Ralph W. Lloyd	808	813	56	1,830,065	48,828
Maryville Col. of the Sac. Heart, St. Louis, Mo.	1872	Odéide Mouton	183	—	30	300,000	22,700
Mary Washington Col., Fredericksburg, Va.	1908	Morgan L. Combs	1,412	2,247	120	—	35,980
Marywood College, Scranton, Pa.	1915	Moth. M. Marcella Gill	480	850	53	—	30,000
Mass. Inst. of Tech., Cambridge, Mass.	1861	Karl T. Compton	3,100	3,260	600	36,000,000	300,000
Mass. State College, Amherst, Mass.	1863	Hugh P. Baker	1,560	1,665	135	—	126,500
Mass. State Tch. Col., Bridgewater, Mass.	1840	John J. Kelly	443	446	41	15,000	12,378
Mass. State Tch. Col., Fitchburg, Mass.	1895	Charles M. Herlihy	263	408	44	—	25,000
Mass. State Tch. Col., Framingham, Mass.	1839	Martin F. O'Connor	451	—	35	—	15,000
Mass. State Tch. Col., Hyannis, Mass.	1897	Anson B. Handy	115	300	10	—	13,500
*Mass. State Tch. Col., Lowell, Mass.	1897	James Dugan	276	—	14	—	9,000
Mass. State Tch. Col., Salem, Mass.	1854	Edward A. Sullivan	436	—	28	—	13,441
Mass. State Tch. Col., Worcester, Mass.	1871	Clinton E. Carpenter	168	170	19	—	16,863
Mercer University, Macon, Ga.	1833	Spright Dowell	512	728	27	1,400,000	65,000
Mercyhurst College, Erie, Pa.	1926	J. M. Gannon	250	325	32	1,500,000	17,000
Meredith College, Raleigh, N. C.	1891	Carlyle Campbell	455	487	39	542,762	24,501
Miami, Univ. of, Coral Gables, Fla.	1925	Bowman Foster Ashe	1,229	1,866	100	—	53,555
Miami University, Oxford, Ohio	1809	A. H. Upham	3,422	3,474	239	—	164,602
Mich. Col. of Mng. & Tech., Houghton, Mich.	1885	Grover C. Dillman	780	900	79	—	40,000
Michigan State Col., E. Lansing, Mich.	1855	John A. Hannah	6,323	6,378	732	$ —	184,000
Mich. State Normal Col., Ypsilanti, Mich.	1849	John M. Munson	1,474	2,585	188	70,000	105,000
Michigan, University of, Ann Arbor, Mich	1817	Alexander G. Ruthven	12,875	16,525	773	15,177,090	1,134,052
Middlebury College, Middlebury, Vt.	1800	Paul Dwight Moody	815	1,553	67	4,256,063	142,000
Middlesex University, Boston, Mass.	1849	C. Ruggles Smith	564	—	85	—	5,500
Midland College, Fremont, Neb.	1887	F. C. Wiegman	319	446	29	168,000	20,000
Miles College, Birmingham, Ala.	1902	W. A. Bell	373	540	21	—	6,600
*Millersville St. Tch. Col., Millersville, Pa.	1854	Landis Tanger	530	660	45	—	25,000
Milligan College, Milligan College, Tenn.	1865	C. E. Burns	311	—	20	130,000	15,387
Mills College, Oakland, Calif.	1852	Aurelia H. Reinhardt	594	926	98	1,884,578	86,121
Millsaps College, Jackson, Miss.	1892	Marion L. Smith	622	672	32	800,000	30,000
Milton College, Milton, Wis.	1867	J. G. Meyer	167	188	21	250,000	16,000
Milwaukee-Downer Col., Milwaukee, Wis.	1895	Lucia R. Briggs	291	292	49	2,091,684	41,317
Milwaukee School of Eng., Mlwke., Wis.	1903	Oscar Werwath	300	450	32	—	—
Minn. State Tch. Col., Bemidji, Minn.	1919	Charles R. Sattgast	383	668	40	—	18,144
Minn. State Tch. Col., Mankato, Minn.	1868	Frank D. McElroy	674	—	60	—	25,000
Minn., University of, Minneapolis, Minn.	1851	Walter C. Coffey	—	21,688	1098	18,619,596	1,183,261
Misericordia College, Dallas, Pa.	1925	Sister Mary Pierre	250	524	60	—	17,000
Mission House College, Plymouth, Wis.	1862	Paul Grosshuesch	146	—	18	69,000	13,254
Mississippi College, Clinton, Miss.	1826	D. M. Nelson	400	—	25	700,000	25,000
Miss. So. Col., Hattiesburg, Miss.	1910	J. B. George	600	1,600	65	—	25,000
Miss. State Col., State College, Miss.	1878	G. D. Humphrey	1,788	2,783	143	—	67,246
Miss. St. Col. for Women, Columbus, Miss.	1884	B. L. Parkinson	1,184	—	90	—	50,000
Mississippi, University of, Oxford, Miss.	1848	A. B. Butts	1,267	1,807	112	—	83,849
**Miss. Woman's Col., Hattiesburg, Miss.	1912	W. E. Holcomb	153	153	20	503,000	13,000
Missouri, University of, Columbia, Mo.	1839	F. A. Middlebush	5,258	7,475	379	1,832,555	418,104
Missouri Valley College, Marshall, Mo.	1889	Thomas W. Bibb	220	235	27	572,407	25,000
Mitchell College, Statesville, N. C.	1853	Grace K. Ramsay	200	—	15	10,000	5,204
Monmouth College, Monmouth, Ill.	1853	James Harper Grier	543	635	47	2,000,000	40,000
Montana School of Mines, Butte, Mont.	1893	Francis A. Thomson	300	—	25	—	16,000
*Montana State College, Bozeman, Mont.	1893	A. L. Strand	1,775	—	174	1,894,838	60,095
*Montana State Normal Col., Dillon, Mont.	1893	Sheldon E. Davis	266	442	24	—	26,000
Montana State Univ., Missoula, Mont.	1893	Ernest O. Melby	1,484	2,163	92	718,178	239,000
Montréal, Collège de, Montreal, Que., Can.	1657	H. Boudreau	350	—	39	—	20,000
Montreal Diocesan Theological College Montreal, Que., Can.	1873	W. A. Ferguson	14	15	3	400,000	12,500
Montréal, Université de, Mont., Que., Can.	1877	H. G. Ar. Charbonneau	7,653	8,793	890	150,000	53,000
Moorhead St. Tch. Col., Moorhead, Minn.	1887	O. W. Snarr	485	—	52	—	23,075
*Moravian Col. & Theol. Sem., Beth., Pa.	1807	W. N. Schwarze	200	210	20	710,526	22,500
Moravian Sem. & Col. for Wom., Beth., Pa.	1742	Edwin J. Heath	306	326	53	175,000	9,351
Morehead St. Tch. Col., Morehead, Ky.	1923	W. H. Vaughan	406	421	60	—	24,688
Morgan St. College, Baltimore, Md.	1867	D. O. W. Holmes	408	816	34	—	30,000
Morningside College, Sioux City, Iowa.	1889	Earl A. Roadman	497	652	49	317,945	46,225
*Morris Brown College, Atlanta, Ga.	1881	W. A. Fountain, Jr.	479	591	30	—	6,448
Morris Harvey College, Charleston, W. Va.	1888	Leonard Riggleman	354	1,564	37	250,000	10,000
*Morristown Norm. & Indus. Col., Tenn.	1881	J. W. Haywood	160	—	10	60,000	8,000
Mount Allison Univ., Sackville, N. B., Can.	1840	George J. Trueman	413	559	50	1,047,551	47,413
Mt. Angel Col. & Sem., St. Benedict, Ore.	1887	James Koessler	115	—	28	48,000	30,000
Mount Holyoke Col., So. Hadley, Mass.	1837	Roswell G. Ham	1,015	1,070	139	5,458,690	172,000
Mount Royal College, Calgary, Alta., Can.	1910	George W. Kerby	165	520	20	—	2,000
Mt. St. Jos.-on-the-Ohio, Col. of, Cincin., O.	1920	Mother Mary Regina	276	299	41	635,000	18,000
Mt. St. Mary Sem. of West, Norwood, Ohio	1829	James W. O'Brien	196	—	12	—	25,000
Mt. St. Mary's Col., Emmitsburg, Md.	1808	John L. Sheridan	300	—	34	250,000	45,000
Mt. St. Mary's Col., Los Angeles, Calif.	1925	Sister M. Dolorosa	207	515	31	—	13,876
Mt. St. Scholastica Col., Atchison, Kan.	1863	Mother Lucy Dooley	288	666	38	—	21,711
Mt. St. Vincent, College of, New York, N.Y.	1847	Sister Catharine Marie	402	547	43	238,345	25,151
Mount Union College, Alliance, Ohio	1846	Charles B. Ketcham	460	509	40	1,439,184	63,500
Muhlenberg College, Allentown, Pa.	1848	Levering Tyson	524	752	41	990,859	59,344
Mundelein College, Chicago, Ill.	1929	Sister M. Justitia	680	—	60	—	20,143
*Murray State Teachers Col., Murray, Ky.	1923	James H. Richmond	1,116	1,535	81	—	33,000
Muskingum College, New Concord, Ohio.	1837	Robt. N. Montgomery	660	957	71	908,947	35,000
N							
Nasson College, Springvale, Me.	1912	Dawn N. Wallace	150	165	16	—	5,000
*National College of Edu., Evanston, Ill.	1886	Edna Dean Baker	474	899	70	56,482	20,894
National University, Washington, D. C.	1869	Leslie C. Garnett	—	659	52	—	14,000
Nazareth College, Nazareth, Mich.	1924	Sister M. Kevin	232	272	24	—	20,000
Nebraska Central Col., Central City, Neb.	1899	O. W. Carrell	77	78	9	50,000	4,500
Neb. State Teachers Col., Chadron, Neb.	1911	Wiley G. Brooks	339	604	51	—	25,350
Nebraska, University of, Lincoln, Neb.	1869	C. S. Boucher	5,811	7,815	391	947,890	368,843
Neb. Wesleyan Univ., Lincoln, Neb.	1887	Benj. F. Schwartz	386	488	42	974,372	31,800
Nevada, University of, Reno, Nev.	1874	L. W. Hartman	961	1,182	92	389,869	65,300
Newark Col. of Engin., Newark, N. J.	1881	Allan R. Cullimore	1,724	2,417	197	51,000	18,824
Newark, University of, Newark, N. J.	1933	George H. Black	798	926	41	160,000	27,376
Newberry College, Newberry, S. C.	1856	James C. Kinard	425	643	27	300,000	20,000
New Bruns., Univ. of, Fredericton, N.B., Can.	1785	Norman MacKenzie	305	455	40	—	30,000
Newcomb Mem. Col., New Orleans, La.	1886	Frederick Hard	737	739	69	2,949,725	300,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
New Hampshire, Univ. of, Durham, N. H.	1866	Fred Engelhardt	2,030	2,509	243	$ 1,258,051	114,041
New Haven St. Tch. Col., N. H., Conn.	1895	Finis E. Engleman	300	809	20	—	16,000
N. J. State Tch. Col., Newark, N. J.	1913	Roy L. Shaffer	468	1,437	42	—	35,655
N. J. State Tch. Col., Trenton, N. J.	1855	Roscoe L. West	730	—	70	—	37,406
N. J. St. Tch. Col., Upper Montclair, N. J.	1908	Harry A. Sprague	655	1,095	55	—	43,464
New Mex. Mil. Inst., Roswell, N. M.	1893	Daniel C. Pearson	619	—	41	—	20,000
New Mex. School of Mines, Socorro, N. M.	1889	C. E. Needham	114	—	15	70,000	6,000
N. M. Col. Agri. & Mech. Arts, St. Col., N.M.	1889	Hugh M. Milton II	804	1,151	87	358,501	45,507
N. Mex. St. Tch. Col., Silver City, N. M.	1893	Haddon W. James	161	193	42	—	25,854
New Mex., Univ. of, Albuquerque, N. M.	1889	James F. Zimmerman	1,505	—	116	1,159,793	82,496
New Rochelle, Col. of, New Rochelle, N. Y.	1904	Mother Thom. Aquinas	740	768	72	—	42,813
N. Y., Col. of the City of, N. Y., N. Y.	1847	Harry N. Wright	8,100	23,000	900	500,000	300,000
N. Y. St. Col. of Forestry, Syracuse, N. Y.	1911	Samuel N. Spring	520	—	47	—	54,000
N. Y. St. Col. for Tch., Albany, N. Y.	1844	John M. Sayles	1,025	1,991	98	—	24,192
N. Y. St. Normal Sch., Brockport, N. Y.	1877	E. C. Hartwell	350	450	30	—	16,500
N. Y. State Norm. Sch., Fredonia, N. Y.	1866	Leslie R. Gregory	500	750	50	—	20,000
N. Y. State Normal School, Geneseo, N. Y.	1867	James B. Welles	435	662	51	—	30,439
N. Y. State Normal School, Oneonta, N. Y.	1889	Charles W. Hunt	399	—	42	—	23,000
N. Y. State Normal School, Oswego, N. Y.	1861	Ralph W. Swetman	500	772	42	—	20,180
N. Y. State Normal School, Potsdam, N. Y.	1869	Clarence O. Lehman	500	573	46	—	19,000
N. Y. St. Norm. & Tr. Sch., New Paltz, N. Y.	1886	L. H. van den Berg	450	691	47	—	14,000
N. Y. State Tch. Col., Buffalo, N. Y.	1871	Harry W. Rockwell	961	—	75	—	26,000
New York University, New York, N. Y.	1831	Harry W. Chase	11,606	18,995	2249	8,607,473	619,259
Niagara Univ., Niagara Univ., N. Y.	1856	Joseph M. Noonan	1,301	1,480	109	—	36,027
Nicolet, Séminaire de, Nicolet, Que., Can.	1803	Robert Charland	300	—	30	350,000	45,000
N. C., Agri. Col. of, Greensboro, N. C.	1891	Ferdinand D. Bluford	948	1,390	77	—	25,000
N. C. College for Negroes, Durham, N. C.	1910	James E. Shepard	746	1,253	53	—	23,382
North Carolina, University of, Chapel Hill, N. C.	1793	Frank Porter Graham	3,918	6,278	330	2,861,000	410,000
North Central College, Naperville, Ill.	1861	Edward E. Rall	557	595	40	1,077,000	27,000
N. D. Agri. Col., Fargo, N. D.	1890	Frank L. Eversull	1,613	1,726	167	1,500,000	62,250
N. D. Sch. of Forestry, Bottineau, N. D.	1907	Albert F. Arnason	132	169	10	—	4,000
*N. D. St. Nor. & Ind. Sch., Ellendale, N. D.	1889	John C. McMillan	478	576	21	—	18,476
N. D. St. Sch. of Sc., Wahpeton, N. D.	1903	E. F. Riley	700	—	40	—	5,000
N. D. St. Tch. Col., Dickinson, N. D.	1918	Chas. E. Scott	356	376	31	—	13,500
N. D. St. Tch. Col., Mayville, N. D.	1889	Cyril W. Grace	385	—	25	—	19,665
N. D. St. Tch. Col., Minot, N. D.	1913	C. C. Swain	702	1,340	52	—	28,000
N. D., University of, Grand Forks, N. D.	1883	John C. West	1,825	2,263	115	—	86,000
N. E. Mo. St. Tch. Col., Kirksville, Mo.	1867	Walter H. Ryle	836	1,992	63	—	47,407
N. E. St. Col., Tahlequah, Okla.	1909	John Vaughan	1,000	—	55	—	34,420
Northeastern Univ., Boston, Mass.	1898	Carl Stephens Ell	3,012	7,248	345	427,449	31,482
Nor. Ill. State Tch. Col., DeKalb, Ill.	1899	Karl Langdon Adams	1,008	1,662	83	—	44,320
Nor. Mich. Col. of Edu., Marquette, Mich.	1899	Henry A. Tape	522	1,090	60	—	32,967
Nor. State Tch. Col., Aberdeen, S. D.	1901	N. E. Steele	687	722	51	—	26,000
North Georgia College, Dahlonega, Ga.	1873	J. C. Rogers	650	847	34	—	9,800
Northland College, Ashland, Wis.	1892	Joseph D. Brownell	246	—	21	130,000	26,000
*North Tex. Agri. Col., Arlington, Tex.	1917	E. E. Davis	1,821	2,340	74	—	19,061
*Nor. Tex. State Tch. Col., Denton, Tex.	1890	W. Joseph McConnell	3,581	6,581	212	—	115,001
N. W. Mo. State Tch. Col., Maryville, Mo.	1905	Uel W. Lamkin	800	1,500	70	—	35,000
Northwest Nazarene Col., Nampa, Ida.	1913	Russell V. De Long	600	650	46	—	14,000
Northwestern College, Watertown, Wis.	1865	Erwin E. Kowalke	224	—	17	83,300	21,200
Northwestern State College, Alva, Okla.	1897	Chester O. Newlun	950	1,025	42	—	19,823
Northwestern University, Evanston, Ill.	1851	Franklyn B. Snyder	6,137	18,239	1380	30,000,000	668,410
Norwich University, Northfield, Vt.	1819	John M. Thomas	519	645	44	739,981	36,000
Notre Dame College, South Euclid, Ohio.	1922	Mother Mary Evarista	118	202	37	—	19,800
Notre Dame of Md., Col. of, Balti., Md.	1896	Sister Mary Frances	233	249	36	10,000	19,520
Notre Dame, Univ. of, Notre Dame, Ind.	1842	Hugh O'Donnell	3,183	4,300	293	1,010,000	239,400
Nova Scotia Agri. Col., Truro, N. S., Can.	1885	C. Eric Boulden	62	165	18	—	5,000
*Nova Scotia Normal Col., Truro, N.S., Can.	1855	D. G. Davis	300	—	12	—	5,530
O							
Oakland City Col., Oakland City, Ind.	1885	W. P. Dearing	144	220	15	314,850	11,613
*Oberlin College, Oberlin, Ohio	1833	Ernest H. Wilkins	1,640	1,749	181	19,451,314	413,797
Occidental College, Los Angeles, Calif.	1887	Remsen D. Bird	797	818	76	1,232,904	63,113
Oglethorpe University, Atlanta, Ga.	1913	Thornwell Jacobs	300	—	35	—	60,000
*Ohio Northern Univ., Ada, Ohio	1871	Robert Williams	701	722	41	403,521	22,900
*Ohio State University, Columbus, Ohio	1873	H. L. Bevis	—	17,568	800	—	601,358
Ohio University, Athens, Ohio	1804	Herman G. James	3,069	4,305	251	69,719	133,721
Ohio Wesleyan Univ., Delaware, Ohio	1842	H. J. Burgstahler	1,457	1,479	120	3,701,345	160,000
*Okla. Agri. & Mech. Col., Stillwater, Okla.	1891	Henry G. Bennett	6,500	13,865	347	—	138,000
Okla. Baptist Univ., Shawnee, Okla.	1910	John W. Raley	892	955	32	26,000	15,000
Okla. Col. for Women, Chickasha, Okla.	1908	M. A. Nash	975	1,005	60	—	25,000
*Oklahoma, University of, Norman, Okla.	1892	Joseph A. Brandt	8,201	8,527	375	3,649,702	354,479
Olivet College, Olivet, Mich.	1844	Joseph Brewer	204	210	27	206,281	34,578
Olivet Nazarene College, Kankakee, Ill.	1908	A. L. Parrott	428	548	31	—	6,000
Omaha, Municipal Univ. of, Omaha, Neb.	1908	Rowland Haynes	926	—	60	—	75,000
*Ontario Agri. Col., Guelph, Ont., Can.	1874	George I. Christie	352	1,882	130	—	42,000
Oregon Coll. of Ed., Monmouth, Ore.	1882	C. A. Howard	431	715	49	$ —	28,164
Oregon State College, Corvallis, Ore.	1868	F. A. Gilfillan	5,117	6,114	356	260,714	182,000
Oregon, University of, Eugene, Ore.	1872	Donald M. Erb	3,416	4,253	290	794,279	315,000
Ottawa, University of, Ottawa, Ont., Can.	1848	Joseph Hébert	1,415	2,162	152	—	128,000
Ottawa University, Ottawa, Kan.	1865	Andrew B. Martin	254	302	24	459,547	18,500
Otterbein College, Westerville, Ohio	1847	J. Ruskin Howe	427	476	33	1,283,727	31,500
Ouachita College, Arkadelphia, Ark.	1886	James Richard Grant	600	780	40	575,000	24,000
Our Lady of Elms, Col. of, Chicopee, Mass.	1928	Thomas M. O'Leary	164	—	17	—	18,000
*Our Lady of the Lake Col., San Ant., Tex.	1896	John L. McMahon	395	1,070	52	254,080	44,623
Ozarks, The Col. of the, Clarksville, Ark.	1891	Wiley Lin Hurie	177	216	23	399,071	20,000
P							
Pacific College, Newberg, Ore.	1891	Emmett W. Gulley	120	130	17	290,000	10,000
*Pacific, College of the, Stockton, Calif.	1851	Tully C. Knoles	336	802	86	572,234	39,500
Pacific Union College, Angwin, Calif.	1909	Walter I. Smith	500	700	62	—	25,000
Pacific University, Forest Grove, Ore.	1849	Walter C. Giersbach	342	416	30	300,000	28,000
Paine College, Augusta, Ga.	1882	Edmund C. Peters	344	380	22	35,000	17,000
Park College, Parkville, Mo.	1875	William L. Young	520	526	40	1,315,342	35,000
Parsons College, Fairfield, Iowa	1875	Herbert C. Mayer	275	415	30	421,233	22,500
Pasadena College, Pasadena, Calif.	1902	H. Orton Wiley	380	430	32	—	14,000
Pembroke State College for Indians, Pembroke, N.C	1887	Owens Hand Browne	80	110	15	—	3,279
Penn, William, Col., Oskaloosa, Iowa	1873	Henry Edwin McGrew	225	345	22	30,000	23,300
Pa. Col. for Women, Pittsburgh, Pa.	1869	Herbert L. Spencer	332	346	42	619,325	24,068
Pa. Military College, Chester, Pa.	1821	Frank K. Hyatt	225	—	30	—	10,000
Pa. State College, The, State College, Pa.	1855	Ralph D. Hetzel	6,720	10,204	624	517,000	210,000
Pa. State Teachers College, California, Pa.	1849	Robert M. Steele	479	1,313	48	—	20,194
Pa. State Tch. Col., Clarion, Pa.	1867	Paul G. Chandler	260	390	28	—	20,060
Pa. State Tch. Col., E. Stroudsburg, Pa.	1893	Joseph F. Noonan	451	665	55	—	23,317
Pa. State Teachers Col., Edinboro, Pa.	1857	L. H. Van Houten	213	388	26	—	20,000
Pa. State Tch. Col., Lock Haven, Pa.	1870	John G. Flowers	400	459	33	—	24,500
*Pa. State Tch. Col., Shippensburg, Pa.	1871	Albert L. Rowland	478	847	42	13,500	22,600
Pa. State Tch. Col., Slippery Rock, Pa.	1889	Dale McMaster	441	789	54	—	28,233
Pennsylvania, Univ. of., Philadelphia, Pa.	1740	Thomas S. Gates	11,190	14,694	1656	22,911,846	958,523
Pestalozzi Froebel Tch. Col., Chicago, Ill.	1895	Herman H. Hegner	73	541	25	—	5,358
Philander Smith Col., Little Rock, Ark.	1869	M. LaF. Harris	354	666	33	133,000	15,000
Phillips University, Enid, Okla.	1906	Eugene S. Briggs	581	938	42	686,676	38,000
Piedmont College, Demorest, Ga.	1897	M. B. Dana	196	453	24	185,000	19,000
Pittsburgh, Univ. of, Pittsburgh, Pa.	1787	John G. Bowman	6,449	13,379	1251	3,085,407	401,745
Plymouth Teachers College, Plymouth, N.H.	1870	Ernest L. Silver	183	—	33	—	18,000
Pomona College, Claremont, Calif.	1887	Elijah Wilson Lyon	849	978	85	3,843,826	98,500
Portland, Univ. of, Portland, Ore.	1901	Chas. C. Miltner	780	857	54	—	18,000
Prairie View State Col., Prairie View, Tex.	1876	W. R. Banks	1,329	2,580	90	—	21,000
Pratt Institute, Brooklyn, N. Y.	1887	Charles Pratt	1,825	3,035	270	8,000,000	144,462
Presbyterian College, Clinton, S. C.	1880	William P. Jacobs	305	309	25	150,000	20,000
Prince of Wales College, Charlottetown, Prince Edward Island, Canada	1860	George-Douglas Steel	490	—	22	—	6,000
Princeton University, Princeton, N. J.	1746	Harold W. Dodds	2,699	3,001	375	33,273,602	976,260
Principia Col. of Lib. Arts, Elsah, Ill.	1910	Frederic E. Morgan	328	—	30	636,993	26,000
Providence College, Providence, R. I.	1919	John J. Dillon	856	1,015	65	75,000	32,047
*Prov. Inst. Tech. & Art, Calg., Alta., Can.	1916	W. G. Carpenter	563	1,226	33	—	2,400
Puerto Rico, Univ. of, Rio Piedras, P. R.	1903	R. Menendez Ramos	3,653	5,441	300	1,029,654	67,295
Puget Sound, College of, Tacoma, Wash.	1888	Edward H. Todd	719	1,048	44	1,200	40,025
Purdue University, Lafayette, Ind.	1869	Edward C. Elliott	6,499	6,575	521	340,000	161,193
Q							
Queens College, Charlotte, N. C.	1857	Hunter B. Blakely	400	446	43	323,000	18,324
Queen's University, Kingston, Ont., Can.	1841	Robert C. Wallace	1,588	1,966	147	3,513,790	197,571
R							
Radcliffe College, Cambridge, Mass.	1879	Ada L. Comstock	829	950	400	5,524,104	90,000
Radford State Tch. Col., Radford, Va.	1910	David W. Peters	515	1,390	58	—	25,749
Randolph-Macon College, Ashland, Va.	1830	J. Earl Moreland	242	—	17	964,702	24,863
Rdlph.-Macon Wom. Col., Lynchburg, Va.	1893	Theodore H. Jack	674	—	75	1,250,000	55,000
Redlands, University of, Redlands, Calif.	1909	Elam J. Anderson	624	799	66	3,444,427	58,530
*Reed College, Portland, Ore.	1911	Dexter M. Keezer	495	545	60	1,814,865	65,000
Regina College, Regina, Sask., Can.	1941	Stewart Basterfield	192	380	31	—	2,000
Regis College, Denver, Colo.	1888	Robt. M. Kelley	241	—	29	—	47,960
Regis College, Weston, Mass.	1927	Sister Honora	508	830	50	—	20,000
Rensselaer Poly. Inst., Troy, N. Y.	1824	Wm. O. Hotchkiss	1,434	—	175	8,718,000	33,000
R. I. Col. of Edu., Providence, R. I.	1920	Lucius A. Whipple	439	842	61	—	56,529
Rhode Island State Col., Kingston, R. I.	1892	Carl R. Woodward	1,129	1,155	111	—	64,241
Rice Institute, The, Houston, Texas	1912	Edgar O. Lovett	1,422	—	93	15,500,000	160,000
*Richmond, University of, Richmond, Va.	1832	F. W. Boatwright	1,128	2,026	95	3,155,621	95,000
Rio Grande College, Rio Grande, Ohio.	1876	R. Lloyd Pobst	106	—	12	70,000	9,000
Ripon College, Ripon, Wis.	1851	Silas Evans	502	509	36	902,258	39,000
River Falls St. Tch. Col., River Falls, Wis.	1874	J. H. Ames	521	690	45	—	23,500

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Roanoke College, Salem, Va.	1842	Charles J. Smith	375	523	30	$ 675,000	24,000
Rochester, University of, Rochester, N. Y.	1850	Alan Valentine	2,137	3,410	513	51,821,181	376,660
Rockford College, Rockford, Ill.	1847	Mary Ashby Cheek	240	419	41	995,389	30,000
Rockhurst College, Kansas City, Mo.	1910	William Hugh McCabe	303	979	38	—	20,000
Rosary College, River Forest, Ill.	1922	Sister Mary Evelyn	514	1,154	58	120,000	44,275
Rosemont College, Rosemont, Pa.	1922	Mother M. Cleophas	277	318	45	55,000	27,043
Rose Polytechnic Inst., Terre Haute, Ind.	1874	Donald B. Prentice	325	—	30	1,900,000	24,000
Royal Military College of Canada, Kingston, Ont., Canada	1876	H. F. H. Hertzberg	200	—	32	—	14,000
Russell Sage College, Troy, N. Y.	1916	James L. Meader	665	680	98	1,026,618	33,124
**Rust College, Holly Springs, Miss.	1866	Lee M. McCoy	221	546	22	30,000	14,000
Rutgers University, New Brunswick, N. J.	1766	Robt. C. Clothier	2,961	3,783	435	5,000,000	324,000
S							
Sacré-Coeur, Collège du, Sudbury, Ont., Can.	1913	Guy Courteau	235	—	35	—	9,000
Sacré-Coeur, L'Université du, Bathurst, N.B., Can.	1899	Simon Larouche	325	400	30	—	10,000
**Sacred Heart College, Louisville, Ky.	1864	Sister M. Dominica	85	85	26	—	11,609
Saint-Alphonse, Séminaire, Aylmer-est. P.Q., Canada	1907	L. Routhier	65	—	15	—	20,000
St. Ambrose College, Davenport, Iowa.	1882	Ambrose J. Burke	1,075	1,368	50	740,000	25,000
Ste-Anne-de-la-Pocatière, Collège of, Sainte-Anne-de-la-Pocatière, Que., Can.	1827	W. Lebon	700	1,500	90	200,000	35,000
St. Anne's College, Church Point, N.S., Can.	1890	Jules Comeau	135	220	20	—	5,000
*St. Anselm's College, Manchester, N. H.	1893	Bertrand C. Dolan	275	—	31	—	13,000
St. Benedict, College of, St. Joseph, Minn.	1913	Mother R. Pratschner	229	413	37	—	30,000
St. Benedict's College, Atchison, Kan.	1858	Martin Veth	315	—	35	—	92,000
St. Bonaventure Col., St. Bonvtre., N. Y.	1859	Thomas Plassmann	425	884	69	—	49,142
St. Catherine, College of, St. Paul, Minn.	1911	Sister Eucharista	624	1,035	55	588,083	67,752
St. Charles-Borromée, Séminaire, Sherbrooke, Que., Can.	1874	Arthur Sideleau	525	—	50	—	30,000
St. Cloud St. Tch. Col., St. Cloud, Minn.	1869	George A. Selke	1,200	1,400	70	—	45,000
St. Edward's University, Austin, Texas	1878	S. F. Lisewski	201	—	41	—	24,000
St. Elizabeth, Col. of, Convent Sta., N. J.	1899	Sister Marie J. Byrne	449	—	45	—	33,000
St. Francis College, Brooklyn, N. Y.	1858	Thomas E. Molloy	200	—	27	—	11,000
St. Francis College, Burlington, Wis.	1930	Isidore Cwiklinski	44	—	6	—	5,605
St. Francis, College of, Joliet, Ill.	1925	Sister M. Aniceta	273	653	40	15,000	22,000
St. Francis College, Loretto, Pa.	1847	John P. J. Sullivan	214	—	28	1,100,000	17,000
St. Francis Xavier University, Antigonish, N.S., Can.	1853	D. J. Macdonald	350	—	26	470,592	35,000
St. Hyacinthe, Séminaire de, St. Hyacinthe, P.Q., Can.	1811	J. Arthur Vézina	420	—	50	?	40,000
St. John's College, Annapolis, Md.	1784	Stringfellow Barr	183	—	30	213,039	38,107
St. John's Lutheran Col., Winfield, Kan.	1893	Carl S. Mundinger	160	170	16	20,000	12,000
*St. John's University, Brooklyn, N. Y.	1870	Edward J. Walsh	7,558	8,731	356	—	60,000
St. John's University, Collegeville, Minn.	1857	Alcuin Deutsch	640	—	58	—	70,000
Saint Joseph College, West Hartford, Conn.	1932	Mother M. Rinaldo	250	754	32	—	13,500
St. Joseph's College, Emmitsburg, Md.	1809	Sister Paula Dunn	205	—	34	—	13,902
St. Joseph's College, Philadelphia, Pa.	1851	Thomas J. Love	505	—	40	—	15,000
St. Joseph's College, Princeton, N. J.	1914	A. deC. Hamilton	85	—	14	—	10,000
St. Joseph's Col. for Women, Brooklyn, N.Y.	1916	Thomas E. Molloy	386	—	44	—	18,000
St. Joseph's Col. for Women, Portland, Me.	1915	George H. Derry	52	202	11	—	1,540
St. Joseph, Séminaire, Mont-Laurier, P.Q., Can.	1915	Robert Jutras	156	—	28	—	8,100
St. Joseph, Séminaire, Trois Rivières, Que., Can.	1860	Chanoine Joseph Desilets	590	—	50	—	20,000
St. Joseph's Univ., St. Joseph, N.B., Can.	1864	J. Hervé Morin	330	535	35	—	10,000
St. Lawrence University, Canton, N. Y.	1856	Millard H. Jencks	687	803	64	5,300,091	76,000
St. Louis University, St. Louis, Mo.	1818	H. B. Crimmins	3,624	7,301	640	1,800,000	374,303
Ste. Marie, Collège, Mon., Que., Can.	1848	Emile Cambron	450	—	40	—	100,000
St. Mary College, Leavenworth, Kan.	1923	Arthur M. Murphy	367	704	39	530,674	25,000
*St. Mary, College of, Omaha, Neb.	1923	Mother M. Gerard	123	126	18	—	8,450
St. Mary of the Lake Sem., Mundelein, Ill.	1921	Reynold Hillenbrand	283	403	32	—	80,000
*St. Mary of the Springs Col., Columbus, O.	1912	Sister M. Aloyse	150	350	40	—	25,000
St. Mary-of-Wasatch, Col. of, Slt. Lk. Cty., U.	1926	Sister Mary Agnes	87	173	20	—	13,243
St. Mary-of-the-Woods Col., Indiana.	1840	Mother Mary Bernard	224	958	41	606,700	55,000
St. Mary's Col., Notre Dame, Holy Cross, Ind.	1844	Sister Mary Madeleva	381	702	54	100,000	27,905
**St. Mary's College, St. Mary, Ky.	1821	A. A. Eicheldinger	85	85	8	—	3,300
*St. Mary's College, St. Mary's Col., Calif.	1863	Brother Albert	503	—	55	—	70,000
*St. Mary's College, St. Mary's, Kan.	1848	Daniel H. Conway	188	—	20	—	31,958
St. Mary's College, Winona, Minn.	1912	Brother Leopold	333	336	32	—	20,000
St. Mary's Sem. & Univ., Baltimore, Md.	1791	John F. Fenlon	508	—	32	—	56,000
St. Mary's University, San Antonio, Tex.	1852	Walter F. Golatka	316	1,154	35	—	21,000
St. Michael's College, Winooski Park, Vt.	1904	J. E. Petty	200	275	23	77,844	21,000
*St. Norbert College, West De Pere, Wis.	1898	Bernard H. Pennings	336	823	51	—	21,500
St. Olaf College, Northfield, Minn.	1874	L. W. Boe	1,088	1,103	79	954,109	51,285
St. Paul Norm. & Indus. Sch. Lwrencville., Va.	1888	J. Alvin Russell	967	—	62	175,000	9,250
St. Peter's College, Jersey City, N. J.	1878	Dennis J. Comey	380	—	38	—	18,000
*St. Procopius College, Lisle, Ill.	1890	Procopius Neuzil	103	—	21	—	31,000
St. Rose, College of, Albany, N. Y.	1920	Edmund Gibbons	340	560	42	$ —	9,525
St. Teresa, College of, Winona, Minn.	1910	Sister M. A. Molloy	380	708	52	—	30,194
Ste. Thérèse, Séminaire de, Ste. Thérèse de Blainville, Que., Can.	1825	Philippe Chartrand	310	—	31	—	30,000
St. Thomas, College of, St. Paul, Minn.	1885	James H. Moynihan	790	797	59	322,500	33,368
St. Vincent College, Latrobe, Pa.	1846	Alfred Koch	432	458	52	2,479,041	64,000
Salem College, Salem, W. Va.	1888	S. Orestes Bond	198	455	22	152,263	14,000
Salem College, Winston-Salem, N. C.	1772	H. E. Rondthaler	326	347	43	455,000	22,000
San Antonio, Univ. of, San Antonio, Texas	1894	W. W. Jackson	230	270	20	—	9,100
San Francisco Col. for Wom., SanFran., Cal.	1930	Mother Leonor Mejia	300	450	35	—	100,000
San Francisco, Univ. of, San Fran., Calif.	1855	William J. Dunne	900	1,285	77	—	55,000
San Jose State College, San Jose, Calif.	1857	T. W. MacQuarrie	3,554	4,752	215	—	75,000
*Santa Barbara St. Col., Santa Barbara, Cal.	1909	Clarence L. Phelps	1,664	1,965	100	—	34,000
Santa Clara, Univ. of, Santa Clara, Calif.	1777	Charles J. Walsh	556	—	74	—	60,000
Sarah Lawrence College, Bronxville, N. Y.	1926	Constance Warren	296	298	57	496,196	37,000
Saskatchewan Univ., Saskatoon, Sask., Can.	1909	James S. Thomson	2,429	3,556	163	162,401	70,000
Scripps College, Claremont, Calif.	1926	Ernest J. Jaqua	212	—	24	824,617	23,566
Seattle Pacific College, Seattle, Wash.	1891	Chas. Hoyt Watson	253	302	33	85,000	15,000
Seton Hall College, South Orange, N. J.	1856	James F. Kelley	688	2,247	103	300,000	22,000
Seton Hill College, Greensburg, Pa.	1918	James A. Reeves	648	709	57	505,000	28,000
Shaw University, Raleigh, N. C.	1865	Robert P. Daniel	451	899	45	333,067	16,748
Shenandoah College, Dayton, Va.	1875	Wade S. Miller	150	192	20	45,945	5,391
*Shepherd St. Tch. Col., Shepherdstwn., W.Va.	1872	W. H. S. White	320	600	20	—	16,100
Shorter College, Rome, Ga.	1873	Paul M. Cousins	213	278	25	400,000	17,925
Shurtleff College, Alton, Ill.	1827	Guy Wimmer	250	392	26	168,449	22,589
Simmons College, Boston, Mass.	1899	Bancroft Beatley	1,365	1,629	195	3,348,878	58,656
Simmons University, Louisville, Ky.	1873	M. B. Lanier	56	—	12	83,000	1,225
Simpson College, Indianola, Iowa	1860		770	771	30	1,250,000	33,000
Sioux Falls College, Sioux Falls, S. D.	1883	Barrett Lowe	175	255	25	—	14,525
Sisters College of Cleveland, Cleveland, O.	1928	Jos. Schrembs	173	603	27	—	20,265
Skidmore College, Saratoga Springs, N. Y.	1911	Henry T. Moore	800	—	78	876,688	47,338
Smith College, Northampton, Mass.	1871	Herbert Davis	2,069	—	254	6,437,945	285,132
Snow College, Ephraim, Utah	1888	James A. Nuttall	165	167	23	—	8,000
South Dakota State Col., Brookings, S. D.	1881	Lyman E. Jackson	1,307	1,541	141	556,272	71,300
So. Dak. St. Sch. of Mines, Rapid City, S.D.	1887	Joseph P. Connolly	404	406	36	—	16,000
South Dakota, Univ. of, Vermillion, S. D.	1882	I. D. Weeks	834	880	110	—	106,025
S. E. Mo. St. Tch. Col., Cape Girardeau, Mo.	1873	Walter W. Parker	1,200	1,250	60	—	70,000
Southeastern State College, Durant, Okla.	1909	T. T. Montgomery	809	856	58	—	32,173
Southeastern Univ., Washington, D. C.	1917	James A. Bell	—	875	70	—	16,500
So. Calif., Univ. of, Los Angeles, Calif.	1879	R. B. von KleinSmid	4,876	14,542	710	1,600,000	292,213
Southern Illinois Normal University, Carbondale, Ill.	1869	Roscoe Pulliam	1,700	2,658	153	—	41,625
Southern Methodist Univ., Dallas, Texas	1911	Umphrey Lee	2,092	3,564	186	2,430,474	130,000
Southern Oregon College of Education, Ashland, Ore.	1926	Walter Redford	463	503	32	—	14,642
Southern St. Norm. Sch., Springfield, S. D.	1897	Wm. A. Thompson	200	203	25	—	10,000
So. Uni. & Agri. & Mech. Col., Scotlndvl., La.	1914	F. G. Clark	968	1,426	121	—	20,774
South, University of the, Sewanee, Tenn.	1858	Alexander Guerry	355	—	31	1,750,000	53,003
S. W. Tex. St. Tch. Col., San Marcos, Tex.	1903	C. E. Evans	1,641	—	63	—	47,000
Southwestern College, Memphis, Tenn.	1848	Charles E. Diehl	404	509	31	480,237	49,721
Southwestern College, Winfield, Kan.	1885	Frank E. Mossman	514	616	37	594,478	24,500
S. W. In. of Tech., Weatherford, Okla.	1901	James B. Boren	1,014	—	72	—	28,000
Southwestern La. Inst., Lafayette, La.	1900	Joel L. Fletcher	2,757	2,793	148	—	37,851
*Southwestern Univ., Georgetown, Texas	1840	John W. Bergin	478	717	34	800,000	62,000
*Spelman College, Atlanta, Ga.	1881	Florence M. Read	369	384	48	3,137,357	65,000
Spring Hill College, Spring Hill, Ala.	1830	Wm. D. O'Leary	315	600	44	200,000	35,000
*Stanford Univ., Stanford University, Calif.	1885	Ray L. Wilbur	—	5,179	650	29,705,083	810,000
Stanstead Col., Stanstead, Que., Can.	1872	Errol C. Amaron	280	—	25	100,000	3,000
State Normal School, Farmington, Me.	1864	Lorey C. Day	260	547	33	—	10,000
Stephens College, Columbia, Mo.	1833	James M. Wood	1,733	—	231	144,504	32,000
Sterling College, Sterling, Kan.	1887	Hugh A. Kelsey	261	314	26	458,000	18,500
Stevens Inst. of Tech., Hoboken, N. J.	1870	Harvey N. Davis	626	1,115	82	—	32,000
Storer College, Harpers Ferry, W. Va.	1867	Henry T. McDonald	103	120	17	120,000	18,000
Stout Institute, The, Menomonie, Wis.	1893	Burton E. Nelson	601	—	45	—	22,200
Sue Bennett College, London, Ky.	1896	Kenneth C. East	126	—	12	—	9,500
Sullins College, Bristol, Va.	1870	Wm. E. Martin	452	—	48	150,000	9,482
Sul Ross State Tch. Col., Alpine, Tex.	1920	Horace W. Morelock	521	927	30	—	25,000
*Susquehanna University, Selinsgrove, Pa.	1858	G. Morris Smith	337	—	35	410,000	18,000
Swarthmore College, Swarthmore, Pa.	1864	John Nason	718	723	99	7,895,958	128,290
Sweet Briar College, Sweet Briar, Va.	1901	Meta Glass	452	—	52	644,495	53,653
*Syracuse Normal School, Syracuse, N. Y.	1924	William W. Wright	149	153	12	—	4,025
Syracuse University, Syracuse, N. Y.	1870	Wm. Pratt Graham	5,691	7,913	715	4,462,851	278,682
T							
Talladega College, Talladega, Ala.	1867	Buell G. Gallagher	306	—	30	1,200,000	31,000
Tarkio College, Tarkio, Mo.	1883	M. Earle Collins	231	326	22	659,702	16,900
*Taylor University, Upland, Ind.	1846	Robt. Lee Stuart	325	—	24	307,368	16,655
Tch. Col., Athenaeum of O., Cincinnati, O.	1928	Carl J. Ryan	61	612	30	—	23,031
Temple University, Philadelphia, Pa.	1884	Robert L. Johnson	5,239	9,690	800	110,014	166,497

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Tenn. Agri. & Indus. St. Tch. Col., Nashvle.	1912	Wm. J. Hale	1,281	1,512	52	$ —	29,923
Tennessee Poly. Inst., Cookeville, Tenn.	1916	Everett Derryberry	800	900	50	—	25,000
Tenn. State Tch. Col., Johnson City, Tenn.	1911	Chas. C. Sherrod	1,066	1,176	52	—	30,057
Tennessee State Tch. Col., Memphis, Tenn.	1912	Richard C. Jones	1,000	1,050	63	—	30,000
Tenn. State Tch. Col., Murfreesboro, Tenn.	1909	Q. M. Smith	950	1,150	55	—	25,000
Tennessee, Univ. of, Knoxville, Tenn.	1794	James D. Hoskins	5,092	—	273	400,000	176,652
Tex., Agri. & Mech. Col. of, Col. Station	1871	Thomas O. Walton	6,674	—	411	209,000	88,000
Texas Christian Univ., Fort Worth, Tex.	1873	M. E. Sadler	1,046	1,737	85	3,900,000	54,705
Texas College, Tyler, Texas	1894	D. R. Glass	475	811	45	—	9,500
Tex. Col. of Arts and Indus., Kingsville, Tex.	1925	J. L. Nierman	1,040	—	65	—	23,178
Tex. Col. of Mines and Metal., El Paso, Tex.	1914	Dossie M. Wiggins	1,438	—	60	586,937	26,500
Texas St. Col. for Women, Denton, Tex.	1901	Louis H. Hubbard	—	3,787	165	—	75,000
*Texas Technological Col., Lubbock, Tex.	1923	Clifford B. Jones	4,076	5,598	211	—	75,076
Texas, University of, Austin, Tex.	1881	Homer Price Rainey	11,146	16,556	594	44,203,548	675,000
*Texas Wesleyan College, Fort Worth, Tex.	1890	Law Sone	—	933	34	167,481	18,223
Tillotson College, Austin, Texas	1881	Mary E. Branch	250	426	25	—	20,000
Toledo, University of, Toledo, Ohio	1872	Philip C. Nash	1,943	2,871	106	25,000	104,415
Toronto, University of, Toronto, Ont., Can.	1827	Henry J. Cody	6,548	7,402	963	13,763,000	394,178
Tougaloo College, Tougaloo, Miss.	1869	Judson L. Cross	161	—	18	45,412	12,061
Transylvania College, Lexington, Ky.	1780	Raymond F. McLain	323	335	27	684,000	41,381
Trinity College, Burlington, Vt.	1925	Mother Emmanuel	75	135	15	—	10,000
Trinity College, Hartford, Conn.	1823	Remsen B. Ogilby	529	537	61	3,601,078	130,000
Trinity College, Sioux City, Ia.	1912	Edwin Leimkuhler	86	183	10	—	10,000
Trinity College School, Port Hope, Ont., Can.	1865	P. A. C. Ketchum	235	—	23	—	6,000
Trinity University, Waxahachie, Tex.	1869	F. L. Wear	316	—	30	713,677	21,588
Tri-State College, Angola, Ind.	1884	Burton Handy	950	—	35	—	7,000
Tufts College, Medford, Mass.	1852	Leonard Carmichael	2,259	2,271	756	7,000,000	200,000
Tulane University, New Orleans, La.	1834	Rufus C. Harris	3,059	5,041	558	11,106,896	270,000
Tulsa, University of, Tulsa, Okla.	1894	C. I. Pontius	708	1,097	92	1,231,613	79,977
Tuskegee Inst., Tuskegee Institute, Ala.	1881	F. D. Patterson	1,398	2,325	257	7,063,711	50,994
U							
Union College, Barbourville, Ky.	1879	Conway Boatman	279	500	21	396,550	15,138
Union College, Lincoln, Neb.	1891	A. H. Rulkoetter	394	445	35	—	31,000
Union College, Schenectady, N. Y.	1795	Dixon Ryan Fox	772	—	75	4,500,000	120,000
Union University, Jackson, Tenn.	1834	John J. Hurt	361	605	31	326,000	16,000
U.S.Coast Guard Acad., New London, Conn.	1876	James Pine	334	—	40	—	17,000
U. S. Military Academy, West Point, N. Y.	1802	Robert L. Eichelberger	1,873	—	298	—	109,000
U. S. Naval Academy, Annapolis, Md.	1845	Russell Willson	3,104	—	314	—	90,794
United Theological College, The, Mont., Que., Can.	1926	George G. D. Kilpatrick	33	34	4	832,889	11,000
Upper Iowa University, Fayette, Iowa	1857	V. T. Smith	280	446	18	513,500	15,284
Upsala College, East Orange, N. J.	1893	E. B. Lawson	444	597	32	200,000	22,000
Ursinus College, Collegeville, Pa.	1869	Norman E. McClure	530	—	44	650,000	30,000
*Ursuline College, Louisville, Ky.	1919	Mother M. Roberta	103	240	27	—	13,000
Ursuline Col. for Women, Cleveland, Ohio	1871	Mother Marie	203	—	33	—	16,321
Utah State Agri. Col., Logan, Utah	1888	Elmer G. Peterson	3,512	3,838	160	6,215	78,000
Utah, University of, Salt Lake City, Utah	1850	LeRoy E. Cowles	3,801	—	291	—	155,935
V							
Valleyfield, Séminaire de, Valleyfield, Que., Can.	1893	Lionel Deguire	315	—	?	—	10,000
Valparaiso University, Valparaiso, Ind.	1859	O. P. Kretzmann	479	528	47	551,276	30,868
Vanderbilt University, Nashville, Tenn.	1872	Oliver C. Carmichael	1,645	—	401	25,191,285	391,524
Vassar College, Poughkeepsie, N. Y.	1861	Henry N. MacCracken	1,240	—	182	10,791,522	226,029
Vermont State Norm. Sch., Castleton, Vt.	1867	Ermo Houston Scott	126	129	12	—	7,000
Vermont St. Norm. Sch., Johnson, Vt.	1867	D. W. McClelland	74	—	8	—	7,148
**Vermont St.Norm.Sch., Lyndon Center, Vt.	1921	Rita L. Bole	125	—	11	—	7,500
Vermont, University of, Burlington, Vt.	1791	John S. Millis	1,322	2,319	266	?	150,000
Villanova College, Villanova, Pa.	1842	E. V. Stanford	971	3,168	159	—	50,000
Vincennes University, Vincennes, Ind.	1806	W. A. Davis	124	151	12	150,000	25,000
Virginia Intermont College, Bristol, Va.	1884	Hugh G. Noffsinger	450	485	40	300,000	10,000
Virginia Military Inst., Lexington, Va.	1839	C. E. Kilbourne	721	—	59	271,503	59,088
Va. Polytechnic Inst., Blacksburg, Va.	1872	Julian A. Burruss	3,413	4,212	265	344,319	91,000
Va. St. Col. for Negroes, Petersburg, Va.	1882	John M. Gandy	1,012	1,648	104	173,000	30,745
Virginia State Tch. Col., Farmville, Va.	1884	Joseph L. Jarman	899	—	53	—	35,418
Va. Theol. Sem. & Col., Lynchburg, Va.	1888	Wm. H. R. Powell	70	—	20	—	4,000
Virginia Union University, Richmond, Va.	1899	John Malcus Ellison	545	961	39	877,000	30,000
*Virginia Univ of, Charlottesville Va.	1819	John L. Newcomb	2,992	4,715	189	11,509,079	360,000
W							
Wabash College, Crawfordsville, Ind.	1832	Frank Hugh Sparks	371	—	32	2,145,531	87,076
Wagner Mem.Luth.Col.Staten Island, N.Y.	1883	C. C. Stoughton	280	327	30	339,200	32,000
Wake Forest College, Wake Forest, N. C.	1834	Thurman D. Kitchin	1,102	1,635	70	3,000,000	61,800
Walla Walla College, College Place, Wash.	1892	George W. Bowers	510	630	40	—	17,000
Wartburg College, Waverly, Iowa	1868	E. J. Braulick	256	350	25	42,000	20,919
Washburn Municipal University of Topeka, Topeka, Kan.	1865	Arthur G. Sellen	671	833	64	1,100,000	51,000
Washington & Jefferson Col., Wash., Pa.	1780	Ralph C. Hutchison	541	617	51	1,580,785	59,549
Washington and Lee Univ., Lexington, Va.	1749	Francis P. Gaines	881	—	65	3,035,695	123,100
Washington College, Chestertown, Md.	1782	Gilbert W. Mead	335	—	30	45,000	24,000
Washington Miss. Col., Takoma Pk., D. C.	1915	Benj. G. Wilkinson	—	684	37	$ —	26,000
*Washington, State Col. of, Pullman, Wash.	1890	Ernest O. Holland	4,274	5,081	251	4,697,879	450,000
Washington St. Norm.Sch., Machias, Me.	1909	Philip H. Kimball	89	—	16	—	6,000
Washington University, St. Louis, Mo.	1853	George R. Throop	3,420	4,679	812	17,857,506	293,267
Washington, University of, Seattle, Wash.	1861	Lee Paul Sieg	8,774	12,130	678	635,000	478,687
Wayland College, Plainview, Texas	1909	George W. McDonald	205	225	13	15,000	6,000
Wayne University, Detroit, Mich.	1868	Frank Cody	4,226	12,511	815	—	141,046
*Waynesburg College, Waynesburg, Pa.	1849	Paul R. Stewart	382	480	23	189,500	19,000
*Weatherford College, Weatherford, Texas	1868	G. C. Boswell	378	466	19	72,000	11,681
Weber College, Ogden, Utah	1889	H. A. Dixon	800	852	76	—	16,000
Webster College, Webster Groves, Mo.	1915	George F. Donovan	182	446	47	—	20,475
Wellesley College, Wellesley, Mass.	1870	Mildred H. McAfee	—	1,512	200	10,790,691	204,161
Wells College, Aurora, N. Y.	1868	William E. Weld	282	—	46	1,437,983	91,000
Wesleyan College, Macon, Ga.	1836	Arthur J. Moore	311	327	42	430,000	26,437
Wesleyan University, Middletown, Conn.	1831	J. L. McConaughy	717	757	84	7,751,604	267,181
Wessington Sprgs. Col., Wess. Sprgs., S. D.	1887	W. A. Harden	80	90	15	9,000	7,000
West Chester St. Tch.Col., West Chester, Pa.	1869	Chas. S. Swope	1,390	2,040	85	—	35,000
*Western Carolina Tch.Col., Cullowhee, N.C.	1889	Hiram T. Hunter	457	502	47	—	16,137
Western College, Oxford, Ohio	1853	Mary D. Thomson	250	—	40	910,621	42,052
*Western Ill. St. Tch. Col., Macomb, Ill.	1899	Walter P. Morgan	1,867	2,489	85	—	45,398
West. Ky. St. Tch. Col., BowlingGreen, Ky.	1907	Paul L. Garrett	1,795	—	121	—	61,906
Western Maryland Col., Westminster, Md.	1867	Fred G. Holloway	587	814	57	902,654	37,000
West. Mich. Col. of Ed., Kalamazoo, Mich.	1904	Paul V. Sangren	2,501	3,726	225	—	54,089
West. Ontario, Univ.of, London, Ont., Can.	1878	W. Sherwood Fox	1,316	1,857	245	733,643	153,978
*Western Reserve Univ., Cleveland, Ohio	1826	Winfred G. Leutner	3,312	11,297	745	14,345,864	546,000
West. St. Col. of Colo., Gunnison, Colo.	1911	Chas. C. Casey	400	792	30	—	20,000
Western Union College, LeMars, Iowa	1900	David O. Kime	298	516	23	196,034	13,225
Westfield State Teachers College, Westfield, Mass.	1839	Edward J. Scanlon	126	—	24	—	15,000
West Liberty St.Tch.Col., W.Liberty, W.Va.	1838	Paul N. Elbin	229	475	25	—	17,771
Westminster College, Fulton, Mo.	1853	Franc L. McCluer	299	—	21	600,000	27,500
Westminster Col., New Wilmington, Pa.	1852	R. F. Galbreath	647	665	55	640,000	24,000
Westminster Col., Salt Lake City, Utah.	1875	Robert D. Steele	145	160	24	140,000	14,500
Westminster College, Tehuacana, Texas	1895	Sprigg Harwood	100	130	9	18,000	10,000
*West Texas St. Tch. Col., Canyon, Tex.	1910	J. A. Hill	1,159	1,205	84	—	49,974
West Virginia State Col., Institute, W. Va.	1891	John W. Davis	1,015	1,305	55	—	25,000
West Virginia Univ., Morgantown, W. Va.	1867	Charles E. Lawall	2,845	3,952	211	105,300	167,179
*West. Wash. Col. of Edu., Bellingham, Wash.	1899	W. W. Haggard	830	884	68	—	60,824
Wheaton College, Norton, Mass.	1834	J. Edgar Park	400	—	72	1,187,859	49,907
Wheaton College, Wheaton, Ill.	1860	V. R. Edman	1,100	1,266	75	650,000	60,000
Whitman College, Walla Walla, Wash.	1859	W. A. Bratton	574	582	48	1,177,088	72,152
Whittier College, Whittier, Calif.	1888	W. O. Mendenhall	497	826	50	693,173	44,952
Whitworth College, Spokane, Wash.	1890	Frank F. Warren	260	—	27	—	14,000
Wichita, Municipal Univ. of, Wichita, Kan.	1926	William M. Jardine	1,345	1,854	80	96,444	62,000
Wiley College, Marshall, Texas	1873	Matthew W. Dogan	400	—	26	600,000	17,071
Willamette University, Salem, Ore.	1842	Carl Sumner Knopf	728	819	62	1,700,000	35,000
William and Mary, Col.of, Williamsburg, Va.	1693	John Stewart Bryan	1,300	—	107	1,381,406	200,000
Wm. Jennings Bryan Univ., Dayton, Tenn.	1925	Judson A. Rudd	75	—	11	—	33,000
William Jewell Col., Liberty, Mo.	1849	John F. Herget	404	495	34	1,208,621	49,300
Williams College, Williamstown, Mass.	1793	James P. Baxter	869	873	93	11,038,969	183,147
William Woods College, Fulton, Mo.	1890	Harlie L. Smith	293	300	30	575,000	10,445
Willimantic State Teachers College, Willimantic, Conn.	1889	George H. Shafer	175	200	40	—	25,000
Wilmington College, Wilmington, Ohio	1870	S. Arthur Watson	200	477	22	320,000	17,000
Wilson College, Chambersburg, Pa.	1869	Paul Swain Havens	372	—	53	850,836	48,000
Winona State Teachers Col., Winona, Minn.	1860	O. Myking Mehus	523	855	50	—	25,000
Winthrop College, Rock Hill, S. C.	1886	Shelton Phelps	1,814	2,402	108	—	54,312
Wisconsin State Tch. Col., Eau Claire, Wis.	1916	W. R. Davies	580	592	47	—	26,111
Wisconsin St. Tch. Col., Milwaukee, Wis.	1880	Frank E. Baker	1,187	1,228	93	—	51,163
Wisconsin State Tch. Col., Oshkosh, Wis.	1871	Forrest R. Polk	656	1,188	50	—	30,000
Wisconsin State Tch. Col., Platteville, Wis.	1866	Asa M. Royce	523	898	46	—	26,063
Wisconsin State Tch. Col., Superior, Wis.	1896	Jim Dan Hill	591	932	57	—	31,188
Wisconsin St. Tch. Col., Whitewater, Wis.	1868	Claude M. Yoder	736	1,256	57	—	50,000
Wisconsin, University of, Madison, Wis.	1848	Clarence A. Dykstra	—	15,000	1700	1,644,335	1,100,000
Wittenberg College, Springfield, Ohio	1845	Rees E. Tulloss	685	925	74	2,138,376	68,068
Wofford College, Spartanburg, S. C.	1851	Henry N. Snyder	461	694	29	796,382	37,894
Woodstock College, Woodstock, Md.	1869	David Nugent	254	—	30	—	200,000
Wooster, College of, Wooster, Ohio	1866	Charles F. Wishart	872	927	75	3,514,493	91,635
Worcester Poly. Inst., Worcester, Mass.	1865	Wat T. Cluverius	613	638	73	4,534,205	25,000
Wyoming, University of, Laramie, Wyo.	1887	J. L. Morrill	1,852	2,822	150	3,987,479	109,977
X							
Xavier University, Cincinnati, Ohio	1831	Celestin J. Steiner	525	1,584	72	—	76,400
Y							
Yale University, New Haven, Conn.	1701	Charles Seymour	5,105	5,205	548	102,110,753	3,074,817
Yankton College, Yankton, S. D.	1881	J. L. McCorison, Jr.	368	459	31	695,708	40,500
Yeshiva College, New York, N. Y.	1928	Bernard Revel	224	229	39	506,200	10,000
York College, York, Neb.	1890	D. E. Weidler	232	372	25	90,000	16,000
Youngstown College, Youngstown, Ohio	1908	Howard W. Jones	881	1,878	95	—	22,000

Updike, Daniel Berkeley (1860–1941), U.S. printer, was born Feb. 24 in Providence, R.I. A leader in the revival of classical typography, he established the Merrymount press in 1893 and was senior partner at the time of his death in Boston, Dec. 28. (See *Encyclopædia Britannica.*)

Uranium. When the radium refinery at Oolen, Belgium, fell into German hands, shipments of ores from the Belgian Congo were shifted from Belgium to the United States. Before the surrender of Belgium, much of the refinery stocks had been shipped to the United States, resulting in a rise in imports of uranium compounds from 376,708 lb. in 1938 to 1,439,324 lb. in 1939. With Belgium no longer a source of supply, imports declined in 1940 to 240,199 lb., largely from Canada, but imports of uranium ore, formerly purely nominal in amount, rose to 2,400,198 lb., all from the Congo. (*See* also RADIUM.) (G. A. Ro.)

Urology. Sulphathiazole, as expected, was found most efficacious in the treatment of infections of the urinary tract and also in combating gonorrhoea. One of the newer derivatives, sulphadiazine, was employed and some observers claimed that it would displace all other sulphonamide drugs. It apparently is somewhat less toxic than sulphathiazole and causes less discomfort to the patient. The uncontrolled administration of the sulphonamide drugs is not without danger.

Knowledge concerning carcinoma of the prostate gland was greatly enhanced. Bilateral orchiectomy will cause reduction in size of carcinoma of the prostate gland and in the majority of cases will temporarily control metastasis when it is present. Pain caused by metastasis of carcinoma of the prostate gland was eliminated almost immediately following castration. Roentgenograms of metastatic involvement of bone showed that the lesions regress and often apparently disappear. There is marked general improvement in the well-being of the patient, accompanied by increase in weight and appetite and improvement in the condition of the blood. Although the prostate gland will be reduced in size and in some cases evidence of metastasis seems to disappear, in other cases the obstruction to urinary drainage will persist and require surgical removal, preferably by trans-urethral resection.

The serum phosphatase, particularly in the acid form, becomes elevated in most cases of prostatic carcinoma in which metastasis has occurred. The serum phosphatase usually returns to normal following orchiectomy, but becomes elevated if metastasis recurs. Androgens, when administered, will cause hyperplasia of the prostatic carcinoma, together with elevation of the phosphatase, while subsequent administration of oestrogen will reduce the hyperplasia and cause a decrease in the amount of phosphatase. Correlation of the results indicated that carcinoma of the prostate gland is an adult form of carcinoma. The effect of sex hormones in the treatment of benign enlargement of the prostate gland, however, was under investigation. Stilbestrol was shown to cause a shrinkage of the gland and, in many cases, amelioration of the patient's symptoms. In most cases, however, any considerable amount of urinary obstruction is not relieved by the use of stilbestrol and other types of treatment are necessary. In some cases, it was found of value in controlling haematuria having its origin in the enlarged prostate gland. Stilbestrol was also found to be of benefit in cases of priapism. Although in many cases the ingestion of small doses will suffice to relieve the symptoms, in others large doses will be necessary. Attention should be called to the reactions which sometimes accompany the use of sex hormones. These reactions include nausea, vomiting, diarrhoea, fever and painful enlargement of the breasts. These hormones should not be used without supervision of an experienced physician.

Interstitial cystitis (Hunner ulcer; submucous fibrosis) has long offered a difficult therapeutic problem. The many methods of treatment suggested for this condition have been of temporary value in some cases but seldom have controlled the lesion. During 1941 it was shown that the instillation of a solution of silver nitrate into the bladder in increasing concentrations gave more relief than any other form of treatment yet suggested. It is best to use dilute solutions of silver nitrate when starting the treatment and gradually increase the strength until a concentration of 1:100 is reached.

In the treatment of renal tuberculosis the value of postoperative care, including improvement in nutrition, rest and solar therapy, was more fully appreciated. Contributions showed that while nephrectomy is sometimes indicated in cases of bilateral renal tuberculosis, the span of life in most cases without operation is much longer than is generally supposed. Duration of life with this condition as long as ten or 15 years is common and in a few cases clinical evidence would suggest a complete arrest of the disease.

In the field of urinary obstruction it was shown that malfunction of the neck of the bladder frequently results from moderate degrees of sphincteric hypertrophy, or contraction. These lesions frequently are erroneously regarded as being of neurogenic origin. Correction of these conditions is frequently possible by means of resecting a small amount of tissue from the neck of the bladder, permitting adequate relaxation. The differential diagnosis of neurogenous lesions and their classification may sometimes be aided by careful cystometrographic studies. (*See* also CHEMOTHERAPY.) (W. F. Br.)

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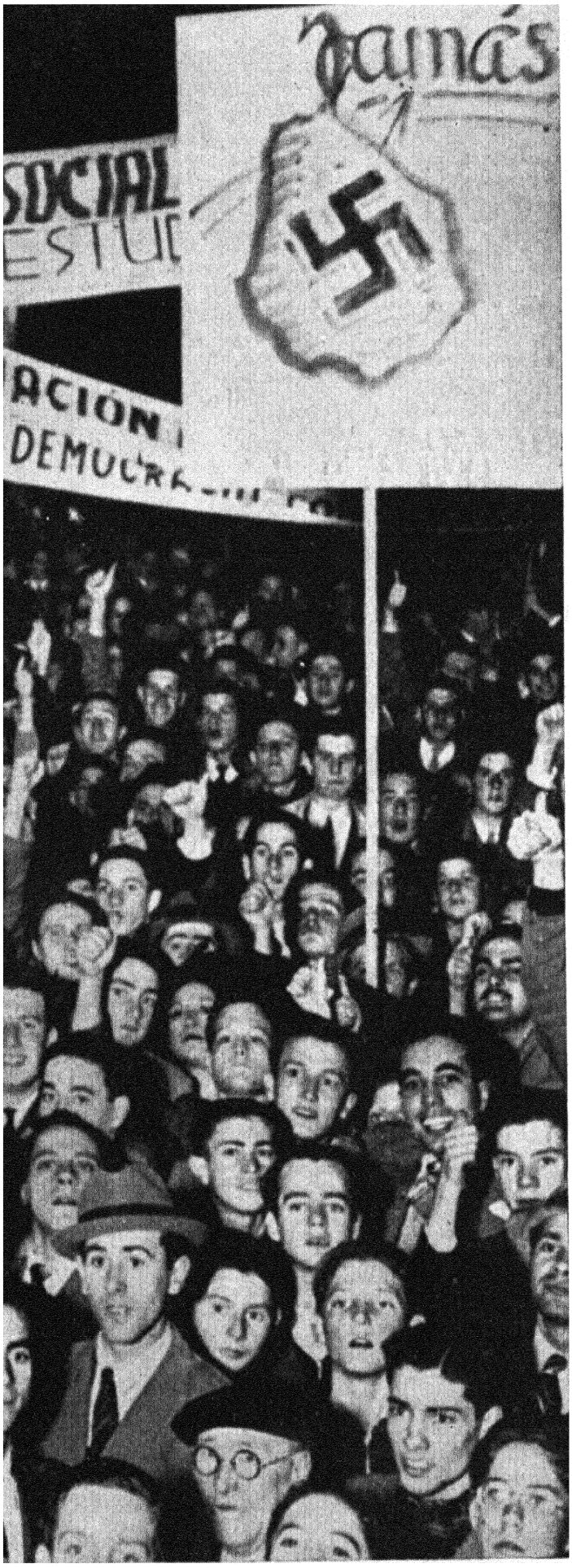
Uruguay. The smallest of the South American republics, on the Atlantic coast between Argentina and Brazil. Area, 72,153 sq.mi.; pop. (1939 official est.) 2,132,888. The percentage of whites is higher than in any American country except Argentina and Canada. Capital, Montevideo, pop. (1941 official est.) 770,000. President in 1941: General Alfredo Baldomir.

History.—Uruguayan developments throughout 1941 stemmed generally from World War II conditions. Several cabinet and congressional crises occurred during the year, with their origins usually in the peculiar constitutional provisions giving the Blanco Nationalist (minority) party, headed by Luis Alberto Herrera, a minimum of three cabinet posts and half the senate membership. To correct this situation, President Baldomir actively supported constitutional reforms. Herrera, strongly anti-United States and inclined to be pro-axis in his sympathies, steadily opposed the administration's foreign policy, the keystone of which was Pan-American co-operation. As early as June 9, President Baldomir formally reiterated Uruguay's traditional policy of granting bases and other facilities for defense of the American continent against external aggression, in line with the principles of American solidarity. Nationalist opposition and Argentine's protests prevented direct granting of bases to the United States; in September, however, a $17,500,000 "lend-lease" grant was made for construction of a huge naval-air base at Laguna Negra, close to the Brazilian border, with the reported understanding that the United States would be allowed full use of its facilities.

Nazi and fascist propaganda and other activity were pro-



STUDENTS IN MONTEVIDEO demonstrating in the Uruguayan capital June 6, 1941 against a pro-axis newspaper. On the placard with the swastika is the word "Never"

nounced throughout the year. Launching of a pro-axis propaganda journal caused riots in May; subsequently its editor, a member of the chamber of deputies, was suspended by that body. Meanwhile, several provocative incidents occurred, notably serious fascist rioting at Durazno on June 28, in which two persons were killed. Following disclosure of widespread nazi intrigue in Argentina, the chamber of deputies appointed a special committee (Oct. 8) to investigate anti-Uruguayan activities in the country.

The Japanese attack on the United States Dec. 7 was met by prompt Uruguayan declarations of American solidarity. Although diplomatic relations with axis countries continued, President Baldomir and Foreign Minister Alberto Guani formally expressed Uruguay's intention to follow its own 1917 precedent and regard any American countries at war as still possessing full nonbelligerent rights, and declared it Uruguay's determined policy to work with the United States at the Rio de Janeiro conference in Jan. 1942.

The Río de la Plata Conference.—In late January and early February, Uruguay was host to the Río de la Plata Regional conference at Montevideo. This meeting of representatives of the four Plata republics (Argentina, Bolivia, Paraguay and Uruguay) and Brazil was attended also by observers from Chile and Peru. As a result, Argentina and Uruguay granted special trade treatment for ten years to landlocked Bolivia and Paraguay, with provisions for reciprocal preferential treatment of each nation's products and freedom of transit, and generally laid the groundwork for possible eventual customs union of the whole area.

Education.—Education is free and compulsory. There were about 1,700 primary schools (enrolment over 200,000) in 1941, and the national university at Montevideo.

Defense.—The army of some 8,000 men (nominal war strength 50,000) was considerably strengthened during 1941.

Finance.—The monetary unit is the peso (value: approx. 52.6 cents U.S. on Dec. 27, 1941; 1940 average value: 37.55 cents U.S.).

Trade.—In 1940 exports were valued at 110,473,000 pesos (a 9.0% increase), and went chiefly to the United States, 25.8% (1939: 13.9%); Great Britain, 20.8% (18.5%); Netherlands, 6.5% (3.4%); Brazil, 5.5% (6.0%). They consisted largely of wool, 49.1% (1939: 36.2%); meats and extracts, 22.1% (21.5%); hides and skins, 9.1% (11.0%); linseed, 6.7% (7.3%); livestock, 4.6% (4.4%); cereals, 0.7% (6.6%). In 1940 imports (principally textiles, foodstuffs, fuel and miscellaneous manufactures) rose 14.4%, to 74,773,000 pesos, mainly from Great Britain, 18.5% (1939: 18.2%); United States 16.3% (5.2%); Argentina, 13.5% (6.7%); and Brazil 9.5% (8.3%).

Communication.—External communication is principally by water and by Pan American Airways, with supplementary rail and highway connections to Argentina and Brazil. There were more than 22,500 mi. of highways in 1941, and 1,683 mi. of railway, with considerable extension of both under construction.

Agriculture and Manufacturing.—Uruguay is primarily pastoral (sheep and cattle), with nearly 80% of the country in grazing land. There is important acreage in wheat, flax, maize and oats. Processing and packing of meat products is an important industry. (*See* also ARGENTINA; HISPANIC AMERICA AND WORLD WAR II.) (L. W. BE.)

USHA (United States Housing Authority): *see* HOUSING.

U.S.O.: *see* UNITED SERVICE ORGANIZATIONS.

Ussishkin, Menahem (1863–1941), Zionist leader, was born Aug. 15 in Dubrovna, Russia. Interested in the Zionist movement at an early age, he came in close association with Theodor Herzl, founder of the modern political movement to resettle Jews in Palestine. In 1897 Ussishkin took a leading role in the first Zionist congress at Basle. He was president of the Jewish National fund, a Zionist land purchasing agency, and was instrumental in the establishment of Jewish settlements in the Holy Land. He was a militant foe of the British plan to partition Palestine and urged retention of the Biblical boundaries of the Holy Land "from Dan to Beersheba." Ussishkin was president of the Zionist general council and executive chairman of the Hebrew university in Palestine at the time of his death in Jerusalem, Oct. 2.

U.S.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Utah. A Rocky Mountain state, admitted to the union in 1896, popularly known as the "Mormon state." Area 84,916 sq.mi.; pop. (1940) 550,310. The rural (nonfarm) population was 150,465, (farm) 94,352; urban 305,493, with the following origins: white (native) 510,662, (foreign born) 32,298; Negro (native) 1,225, (foreign born) 10. Capital, Salt Lake City (149,934). Other principal cities are Ogden (43,688), Provo (18,071) and Logan (11,868).

History.—In 1941 the 24th legislature adopted the sweeping governmental reorganization scheme recommended by the Democratic governor, Herbert B. Maw, in the regular and two special sessions. It created departments of finance and publicity and industrial development and effected greater executive control over finance. Greater co-ordination of boards and commissions was also effected.

In 1941 E. E. Monson was secretary of state, Reese M. Reese, auditor, Oliver G. Ellis, treasurer; Grover A. Giles, attorney-general and Charles H. Skidmore, superintendent of public instruction.

Education.—There were 137,437 children in the public schools in 1940. The total cost of education was $13,271,541.42, with $9,754,606 devoted to operating expenses. There were 4,102 teachers and 611 principals. The University of Utah had 4,000 students and 248 teachers; the Utah State Agricultural college had a net total resident enrolment of 3,641 and a teaching staff of 160. Brigham Young university, with a teaching staff of 155, issued institutional credit to 3,890 students.

Public Welfare, Charities, Correction.—Total state obligations of $8,208,960.03 incurred in 1941 for public assistance were distributed as follows: old-age assistance, $4,521,929.58; aid to dependent children, $1,985,749.69; aid to blind, $57,115.23; general (unemployables) $825,724.45, (employables) $672,401.62; miscellaneous $146,039.46. A total of 21,528 households were receiving state assistance in Dec. 1941 as compared with 21,037 in Dec. 1940.

Communication.—Highway mileage in 1941 was as follows: state, 5,106; county 14,584; city, 2,269. State expenditures in 1941 totalled $4,230,000; federal aid, $2,400,651.43. An additional $800,000 was available from the state licence tax to local areas. There were 2,157 mi. of steam railway in 1938. Utah had more than 30 airports and fields in 1941.

Banking and Finance.—Sixty banks, 47 state and 13 national, had total assets of $227,403,617.52 in 1941; and 15 building and loan associations had aggregate assets of $20,677,678.94. Total bank deposits reached $206,418,293.03. State receipts for the year ending June 30, 1941 were $30,706,852.57; expenditures were $29,183,472.51. The total of outstanding bonds in 1941 was $2,105,000.

Agriculture.—The farm cash income figure of $62,000,000 for the first nine months of 1941 brought Utah agriculture almost back to the peak year of 1925 as producers strove to increase the farm yield as part of the defense program. Stockyards in Ogden and Salt Lake alone handled $56,000,000 worth of cattle, hogs, sheep and calves. Farming gains were aided by new irrigation projects.

Table I.—*Principal Agricultural Products of Utah, 1941 and 1940*

Crop	1941	1940
Hay (tame and wild), tons	1,307,000	1,123,000
Potatoes, bu.	1,782,000	2,040,000
Sugar beets, short tons	570,000	504,000
Celery, crates	139,000	101,000
Tomatoes, tons	73,500	54,800
Onions, lb.	25,000,000	22,000,000
Peas, tons	19,170	13,520

Manufacturing.—The upward trend in manufacturing continued in 1941, with new industries enabling Utah not only to hold its population but to attract newcomers for defense industries. Workers numbered 20,275 at the close of 1941 as compared with 15,982 in the first quarter of the year. Manufacturing pay rolls increased from $23,322,670.16 in 1940 to $28,624,949.60 in 1941, with the final quarter estimated.

Mineral Production.—The United States defense program gave sharp impetus to the state's greatest industry. Production of the nonferrous metals for 1941 was valued at $95,383,057, compared with $86,585,499 in 1940.

Table II.—*Principal Metal Products of Utah, 1941 and 1940*

Metal	Value 1941	Value 1940
Gold	$12,172,460	$12,442,290
Silver	7,967,099	8,655,857
Copper	61,443,018	52,401,264
Lead	7,776,720	7,568,800
Zinc	6,023,760	5,517,288

Military necessity aroused the interest of federal and state authorities as well as private interests in Utah's potentialities with respect to the development of manganese, alunite and other minerals. (F. W. GA.)

Utilities, Public: *see* PUBLIC UTILITIES.

Vanadium. World production of vanadium in 1940 was increased slightly above the 3,000 metric tons estimated for 1939. Reported production was 1,254 tons in Peru, 948 tons in the United States, 428 tons in South-West Africa, and 57 tons in Mexico, while that of Northern Rhodesia is estimated at about 400 tons, making a total of 3,087 tons. Imports into the United States in 1940 were 20,135 long tons of ore, with a vanadium content of 2,574,951 lb., an increase of 21% over 1939, and of 86% over 1938, as compared with a vanadium content of 2,090,601 lb. in ores of domestic origin.

(G. A. Ro.)

Van Devanter, Willis (1859–1941), U.S. jurist, was born April 17 at Marion, Ind. The son of a well-to-do attorney, Van Devanter studied at De Pauw university, graduated from the Cincinnati law school in 1881, and later practised law with his father in Marion. In 1884 he left for Wyoming. Two years after his arrival, he was entrusted with the revision of the state's statutes. In rapid succession he became city attorney of Cheyenne, a member of the territorial legislature, and later chairman of its judiciary committee. In 1889 he became chief justice of the Wyoming supreme court, but left the next year to resume private practice. Active campaigning for McKinley brought him appointment as U.S. assistant attorney-general assigned to the interior department. He remained at this post from 1897 until 1903, when Theodore Roosevelt appointed him judge of the eighth circuit court of appeals; in this capacity he participated in many cases of national importance. In 1910 he was named to the supreme court by President Taft. Ten years later he wrote the unanimous opinion of the court upholding the Volstead act. Van Devanter was not a prolific writer of opinions. A conservative, he dissented frequently in decisions regarding New Deal legislation and he resigned in 1937. Van Devanter was dean of the supreme court after the resignation of Justice Oliver Wendell Holmes in 1932. After his retirement he occasionally sat in the New York federal court. He died in Washington, D.C., Feb. 8.

Van Mook, Hubertus J. (1894?–), Netherlands statesman, was born in Semarang, Java, and entered the Netherlands East Indies government service at the age of 25. He was chief of the bureau of general economics, 1934–37. Later he became director of the department of economic affairs and headed a trade mission to Japan. The Nipponese negotiators, strengthened by the cession of bases in French Indo-China, used "strong-arm" tactics in an attempt to frighten the Netherlands missions into yielding to Japanese demands for economic concessions. But Van Mook stubbornly refused to agree to any move that would imperil the economic and territorial integrity of the Dutch East Indies, and the negotiations ended in a stalemate. On Nov. 20, 1941, he was named minister of colonies in the Netherlands government-in-exile set up in London; this appointment was cancelled, however, on Jan. 2, 1942, and he was appointed lieutenant governor of the Netherlands East Indies at the request of the governor general.

Vargas Diamond: *see* MINERALOGY.

Varnishes: *see* PAINTS AND VARNISHES.

Vassar College. A college for women at Poughkeepsie, N.Y. In 1941 the college announced revised admission requirements designed to give wider opportunity to students with pronounced interests and abilities in certain fields. The new plan, to become effective for entrance in Sept. 1944, maintains the requirements of four years' work in English,

two in mathematics and one in history, to be included in the total of 16 units. By reducing the foreign language minimum from five years to three, and making one year of science an alternative choice instead of a requirement, the college is able to require study beyond the minimum requirement in two of the four fields offered for entrance, still leaving two or three optional units to be chosen from these or other fields leading to the A.B. degree. The committee on admission, which recommended the plan to the faculty after several years' study, believed that the new requirements would equalize entrance opportunities for students from the more conservative private schools and the experimental schools, the large high schools and the small, and benefit rather than lower college standards through the increased vitality of student interest.

The Helen Gates Putnam endowment for conservation, the gift of Dr. Helen Clark Putnam, who graduated from Vassar in 1878, made possible the organization of a graduate division of conservation, in which advanced study in geology, plant science, psychology and zoology, leading to the degree of master of science, is applied to problems of conserving both physical and human resources. Another gift from Dr. Putnam provided a glass laboratory equipped for this work in plant science. (H. N. MacC.)

Vatican City State.

Unusual though it be in peacetime, the Vatican City state becomes unique during war. This tiny area of 108 ac., the residence of the pope and the centre of the world-wide Roman Catholic Church (*q.v.*), enjoys a sovereign and undisputed independence among the nations. Completely encircled by Italian territory, its territorial and other rights were guaranteed by the Lateran treaty, 1929, between the Holy See and Italy, and its integrity is internationally recognized.

It has no defense forces; the gendarmes, numbering about 100, perform police duties; the Swiss, Noble and Palatine guards are employed mostly for official and domestic routine duties. It enjoys free communication with all the nations. Accredited diplomats from 35 nations were attached to the Vatican in 1941.

Pope Pius XII (*q.v.*) continued ruler of the papal domain in 1941, with Luigi Cardinal Maglione as papal secretary of state, and Nicola Cardinal Canali as president of the government of Vatican City. The *Osservatore Romano* is a semi-official daily. The official documentary publication is the *Acta Apostolicae Sedis*. The Vatican radio station became increasingly important because of the war. The population was estimated at about 900 in 1941.

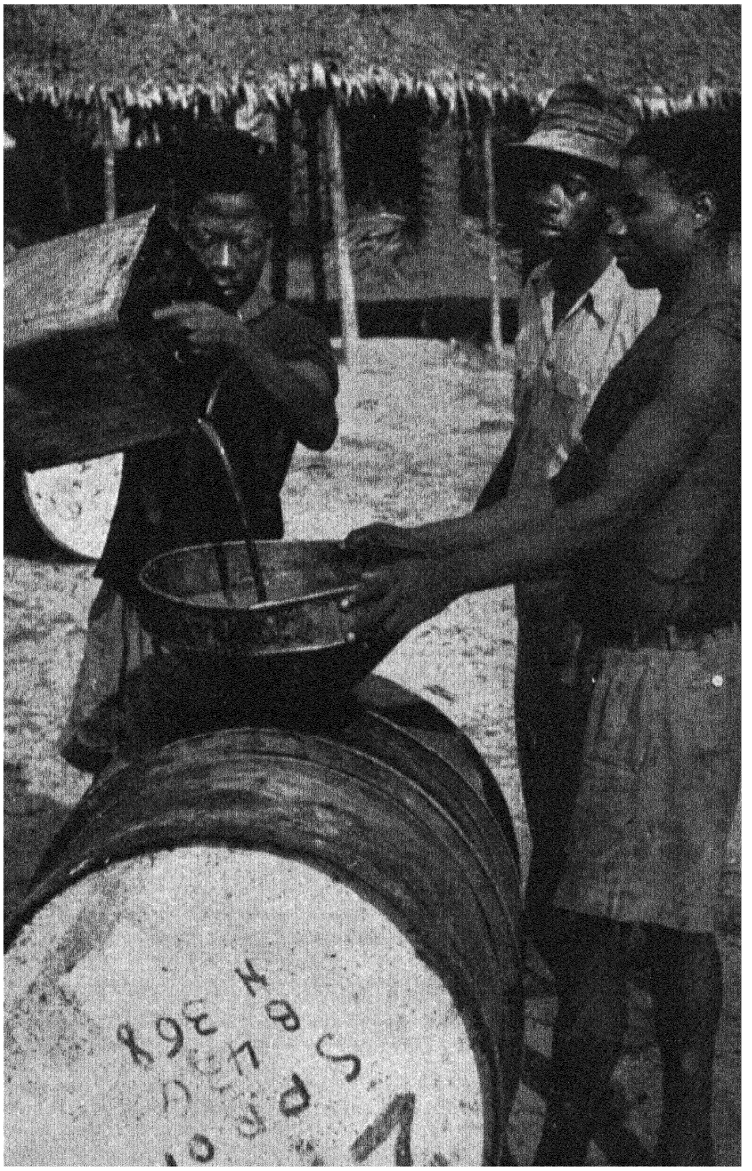
The aim of the Vatican throughout 1941 was the attainment of a just and lasting peace, and its policy was that of strict neutrality between the warring nations. Rigid censorship of news affecting military or political secrets was enforced. Residence was offered to diplomats accredited to Italy and other belligerents. An information bureau for the exchange of information about prisoners and refugees of all nations received, as of Sept. 1941, 364,409 requests; 147,862 replies were sent, mostly by radio. Extensive relief activities were accomplished in war-stricken countries.

The Vatican, through the pope, did not cease to denounce totalitarian principles, and through the radio and *Osservatore Romano* published revelations of persecution and injustice by the nazis and communists. Likewise, it championed the occupied countries of Europe, and expressed approval of democratic principles. In September, the pope held conferences with Myron C. Taylor, representative of President Roosevelt. In May, an agreement was reached with the Spanish government on disputed points, especially the appointment of bishops. An armistice was effected between Peru and Ecuador in the border conflict. (*See* also PIUS XII.) (F. X. T.)

Vegetable Oils and Animal Fats.

Production of oils and fats from domestic materials in the United States in the fiscal year ending June 30, 1941, was estimated by the department of agriculture as about 9,100,000,000 lb. For the year ending June 30, 1942, the same authority estimated that production would be 9,400,000,000 lb. Disappearance of fats and oils in the United States during the year ending June 30, 1941, was placed at 10,500,000,000 lb., with the volume of consumption for the year ending June 30, 1942, estimated at the same figure, including possibly 700,000,000 lb. of lard for export. While consumption outran production and scarcity of shipping handicapped imports in 1941, heavy stocks on hand in the United States prevented a shortage. It was estimated that imports of approximately 1,800,000,000 lb. of vegetable oils and oil seeds (in terms of oil) would be required by the United States for the year ending June 30, 1942. Such imports for the preceding year were 1,600,000,000 lb. The current decline in the production of cottonseed and peanut oils was offset by increases in the output of lard, soybean oil, tallow, greases, linseed, fish and corn oil. In 1941 the demand for vegetable oils and animal fats in the United States reached the highest point in 20 years, owing to the general rise in income that accompanied the expansion of industry in the national defense program and owing to the exports of lard, butter and other edible fats under the lend-lease act. The index number of prices for all fats and oils in Aug.

PALM OIL exported to England was an important source of revenue in 1941 to the Free French possessions of equatorial Africa



1941, in the United States was 91, in percentages of 1924–29 combined averages. This was an advance of 31 points or 52% above Aug. 1940, and 65% above Aug. 1939. Prices for many oils and fats, such as cottonseed and soybean oil and lard, advanced almost 100%. Butter and linseed oil advanced only about 30%. The demand for drying oils in paints and varnishes confronted greater uncertainty than did the demand for oils and fats used in edibles and soaps in 1941. Owing to possible restrictions on building in order to conserve materials and labour for national defense activities, it was believed the demand for drying oils would be limited. The year 1941, however, saw a large increase in the production of linseed oil, 3,400,000 ac. having been planted to flax in the United States in 1941, compared to an average of 2,200,000 ac. in the preceding five years. During the year the U.S. government took steps to increase the exports of butter and lard to Britain. Both of these products had tended to accumulate in the United States in surpluses that required government aid to distribute.

Cottonseed oil from the 1941 cotton crop in the United States was expected to equal 2,800,000 bbl. The carry-over from the preceding crop was 899,000 bbl. Consumption is about 3,000,000 bbl. annually.

Tung Oil.—Annual production of tung oil in the United States is about 5,000,000 lb. The bulk of the U. S. supply comes from China, such imports ranging from 175,000,000 lb. in 1937 to 79,000,000 lb. in 1939. Shipments from China to the United States in the first nine months in 1941 amounted to 26,000,000 lb. On Jan. 8, 1942, the OPM restricted use of tung oil to the following: defense orders with preference ratings of A2 or better; orders placed by the Defense Supplies corporation; orders for manufacturing outside can-coatings where tung oil is essential to withstand normal food processing; orders for uses to comply with underwriters, health, sanitary or safety regulations or laws issued to provide such regulations or laws specifically requiring tung oil. (*See* also BUTTER: *Oleomargarine;* COCO-NUTS; COTTON; SOYBEANS.) (S. O. R.)

Vegetables: *see* CORN; LETTUCE; POTATOES; TOMATOES; TRUCK FARMING; MARKET GARDENING; ETC.

Venereal Diseases.

Protection of the armed and industrial forces of defense in the U.S. from losses due to syphilis and gonorrhoea became the immediate objective of federal, state and local agencies in 1941, the fifth year of their national venereal disease control program.

The selective service regulation requiring for the first time in the history of military medicine a blood test for syphilis on army candidates proved to be one of the greatest case-finding measures ever undertaken. Tabulation of serologic and clinical evidence of syphilis found among the first million drafted men appearing for physical examination showed 4·5% infected. The syphilis rates ranged by states from highs of 17% for Florida and 15.6% for South Carolina to lows of .56% and .63% for New Hampshire and Wisconsin, respectively. The high and low for white persons alone were 5% for Arizona and ·5% for Wisconsin; for Negroes, 40% Florida and 8% Massachusetts.

Table I.—*Prevalence of Syphilis in Drafted Men and General Population*

Region	Drafted Men Rate per 100*	General Population	
		Est. Rate per 100†	Est. No. Cases†
United States	4·5	2·4	3,171,861
16 South. States and D. C.	10.3	4.6	1,904,365
South Atlantic	11.3	5.3	952,651
East South Central	10.3	4.2	454,619
West South Central	9.2	3.8	497,095
32 Northern States	2.1	1.4	1,267,496
New England	1.1	0.6	53,471
Middle Atlantic	2.2	1.4	376,201
East North Central	2.3	1.6	415,971
West North Central	1.7	1.2	168,612
Mountain	2.8	2.0	81,406
Pacific	2.7	1.8	171,835

*Males, aged 21–35. †Males and females, all ages.

The table above shows regional and national conscript rates, and an estimate of 1941 prevalence of syphilis made from them. Statisticians of the U.S. public health service regarded the figures, 3,200,000 cases or 2·4%, as being "probably the closest estimate of the true prevalence of syphilis ever made for the United States," since never before had it been possible to sample so large a section of the population with comparable uniformity. It was hoped that continued study of such data will indicate the trend of syphilis. This trend was difficult to determine from cases reported to state health departments because of the unknown proportion under private medical care which were not reported.

Statistical study of early syphilis cases coming under the treatment of both public clinics and private physicians in certain surveyed areas, however, provided a new estimate that the national incidence had declined from 259,000 new admissions per year in 1936–37 to 173,000 in 1939–40. This 33% decline in the syphilis attack rate, which was supported by other evidence, paralleled the tremendous increase in diagnostic and treatment facilities for syphilis and gonorrhoea from 1937 to 1941.

Table II.—*Venereal Disease Control Activities of State Health Departments*

Fiscal Year	No. of Clinics	Clinic Admissions		Serologic Tests†	Drugs Distributed	
		Syphilis Cases	Gonorrhoea Cases		Doses of Arsenicals†	Sulfonamide Tablets†
1938 . .	1,746*	149,434	44,752	3.6	2.8	‡
1939 . .	2,405*	249,464	62,835	5.6	4.7	3.5§
1940 . .	2,887*	288,778	66,811	10.2	6.9	5.3
1941 . .	3,245	340,615	84,418	16.5	8.2	7.2

*End of calendar year. ‡No data. §Estimate. †In millions.

Expansion of these facilities continued in 1941 as shown in the table of activities reported by state health departments. The figures reflect the 24% increase over 1940 in the budgets of federal ($6,400,000), state ($3,000,000) and local funds ($3,800,000) for 1941, the third year of activity under the Venereal Disease Control Act of 1938. In addition, a $5,000,000 program of local assistance in defense areas was begun by the WPA.

The 1941 venereal disease control program emphasis may be epitomized as (1) rehabilitation of deferred infected selective service men, (2) expansion of gonorrhoea control facilities to match those for syphilis, (3) reinforcement of local clinic and field personnel in boomtown and cantonment areas, and (4) contact-tracing of patients with new infections.

The last point was the public health *modus operandi* against prostitutes, who are the chief sources of military infection. Meanwhile social hygiene leaders sought the police suppression of prostitution as the most effective method of preventing transmission of venereal disease to soldiers. To this end, congress passed the May act (Public Law 163), effective July 11, 1941, prohibiting prostitution in designated civilian areas adjacent to military or naval concentrations.

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Venezuela.

A federal republic in northeast South America. Area, 393,976 sq.mi.; pop. (1936 census) 3,491,159, including 103,492 Indians. Capital, Caracas (203,432; 1941 est. 265,000). Other cities (with 1936 figures): Maracaibo (110,010); Valencia (49,214); Barquisimeto (36,429); Nirgua (30,706); Cárupano (30,163); Maracay (29,759); Río Caribe (29,696); Boconó (25,315); Ciudad Bolívar (25,134).

Venezuela is a federal union of 20 states, a federal district, 2 federal territories and one "federal dependency." The congress is bicameral and is elected indirectly. The president is elected by the congress for a term of five years and is ineligible for the succeeding term. President: Gen. Isaías Medina Angarita (succeeded President Eleázar López Contreras May 9, 1941).

History.—Venezuelan history in 1941 was marked by continued progress toward democracy, and by a peaceful and orderly transfer of presidential power. Under war conditions the country's economic position was on the whole improved and strengthened. Internationally, Venezuelan policy was one of furthering hemispheric solidarity.

On Jan. 30, half the membership of the national Chamber of Deputies was renewed in a nationwide election, of more than usual importance because the new congress was to elect a successor to President López Contreras. The new congress was overwhelmingly in support of the president. He, however, already had rejected earlier suggestions that, owing to world uncertainties, he avail himself of legal loopholes to accept a new term. On April 5

President López formally reiterated his determination not to accept re-election. Congress, therefore, on April 28, by a vote of 120 out of 137, chose General Isaías Medina Angarita, the incumbent minister of war, as the new president. On May 9, President Medina took office, in the first free and open transfer of presidential power from one constitutional president to another in the nation's history. The new president, in his inaugural address, declared his intention to continue the liberal program of his predecessor and to co-operate with the United States. Evidence of his sincerity was seen in September when his opponent for the presidency, the novelist Rómulo Gallegos, was allowed to form without government opposition a new party, the Acción Democrática, a group with slightly leftist leanings.

Closer co-operation with the United States remained a definite part of Venezuelan foreign policy in 1941. Former President López Contreras himself made an extended visit to the United States in September. With the outbreak of war between the United States and axis powers in December, Venezuela hastened to support the program of American solidarity. Increased military precautions were taken, ports were opened to all American powers at war with the axis, and radio communication was restricted to the Americas only. On the last day of the year diplomatic relations with Germany, Italy and Japan were formally severed.

Improved relations with immediate neighbours also characterized Venezuelan foreign policy in 1941. In January, a treaty with Brazil providing for peaceful settlement of all controversial issues was ratified. In April, a hundred-year-old boundary dispute with Colombia was ended through negotiation. The latter agreement called for improved commercial relations between the two countries.

Education.—Primary education is compulsory and under federal control. There were, in 1941, nearly 7,000 schools, with some 250,000 students; also 74 normal and secondary schools (24 private), and two national universities (at Caracas and Mérida).

Finance.—The monetary unit is the bolívar (value in 1941: approx. 27 cents U.S.). Venezuela had no external debt and the internal debt was nominal in 1941. The 1940–41 budget amounted to 344,515,000 bolivares, 17,000,000 less than in 1939–40. About 35% of government receipts was derived from oil royalties and land taxes, and petroleum produced more than 90% of the foreign-exchange income.

Trade.—In 1940 imports, largely foodstuffs, machinery, textiles and other manufactures, were valued at 326,393,000 bolivares (a 4.7% decline), mainly from the United States, 73.7% (1939: 61.1%), Great Britain 7.6% (6.2%), Japan 3.2% (1.9%). Exports totalled 860,909,000 bolivares (a 9.7% decline), with petroleum and its products aggregating 94.0% (1939: 93.9%). Non-petroleum exports in 1940, mostly coffee (36%), gold (32.4%), cacao (16.4%), hides (3.4%) and cattle (2.3%) went principally to the United States, 77.5% (1939: 52.1%), Trinidad 4.3% (2.8%), Italy 3.7% (2%) and Japan 2.8% (0.3%). Germany took 28.8%, mainly coffee, in 1939 and supplied 9.5% of imports.

Communication.—External communication is by frequent steamship service, and by Pan American Airways and Royal Dutch Airways (to Curaçao and Colombia). There were 640 mi. of railway in 1941. Highways are inadequate (less than 6,000 mi. improved in 1941), but the number of automobiles is relatively large (33,016 in 1941). Internal air transport is by a domestic line.

Agriculture.—Coffee is the main agricultural export, and until 1939 more than half was taken by Germany. The Inter American quota allotment (revised) for 1940–41 export to the United States was 438,757 bags, but actual export was some 200,000 bags in excess (deductible from 1941–42 total). The 1941–42 crop was estimated at 800,000 bags, and the quota for export to the United States 465,970 bags.

Mineral Production.—Venezuela is the third largest petroleum producer, with an estimated 1941 production of 227,000,000 bbl. (1940: 184,761,000), almost equal to the U.S.S.R's 242,000,000 bbl. (1942 est.). The main fields lie in the extreme west, but newer fields in the east (Anzoátegui state and the Orinoco valley), first exploited in 1936, contributed much of the 1941 increased output. There are, however, only ten refineries in the country, with a maximum capacity of 40,000,000 bbl. annually. Most of the production goes to refineries in Curaçao, which took 70.8% of 1940 production (1939: 76.3%), the remainder going largely to the United States (1940: 19%; 1939: 13.4%).

A miscellany of other minerals, including gold, diamonds, iron and coal is found, but only gold is exploited to any degree. (L. W. Be.)

Vermiculite. Sales of vermiculite in the United States increased 5% in 1940, to 22,209 short tons, but value decreased 15%. The production is mainly from Montana, with smaller amounts from North Carolina, Colorado, and Wyoming. Attempts were being made to develop a deposit in the Palabora district of the Transvaal. (G. A. Ro.)

Vermont. A north Atlantic state, first to be added to the original thirteen of the United States; popularly known as the "Green Mountain State"; area, 9,718 sq.mi., of which 440 sq.mi. are water. The population in 1940 was 359,231, including 235,992 rural, 123,239 urban. There were 327,079 native whites, 31,727 foreign-born, 384 Negro, 41 of other races. Montpelier is the capital, with a population of 8,006. The two largest cities are Burlington on Lake Champlain (27,686), and Rutland (17,082).

History.—Vermont gained the reputation of being the first state to declare war on the axis powers when in a special legislative session it granted a bonus of $10 a month to its men in service, a sum which had been voted by a previous session in case the United States went to war. During 1941 former Governor George D. Aiken took his seat as U.S. senator from Vermont. Provision was made for a referendum on women jury service to be decided at the general elections in 1942. William H. Wills was governor in 1941; Warren R. Austin and George D. Aiken, U.S. senators; Mortimer R. Proctor, lieutenant governor; Thomas H. Cave, state treasurer; Rawson C. Myrick, secretary of state.

Education.—There were 1,180 elementary schools in Vermont, with an enrolment in 1941 of 44,524 and a teaching staff of 1,954. The secondary schools numbered 92, with an enrolment of 16,637 and a teaching staff of 698. Three normal (teacher-training) schools had an enrolment of 377 and a teaching staff of 29. The University of Vermont had a regular enrolment in 1941 of 1,332 and a faculty of 250.

Public Welfare.—As the town is the unit of government in Vermont, general relief is distributed through the towns by the overseers of the poor. General relief thus distributed in 1941 totalled approximately $640,000. The state department of public welfare, which has under its jurisdiction eight institutions, had an appropriation of $1,099,000. The department also has federal funds for blind assistance and aid to the dependent. Unemployment insurance commanded $2,716,751.59 in 1941; WPA employment from Jan. 1 through Nov. 30, 1941 was given to 2,845 persons. During the same period expenditures for labour amounted to $1,871,156.41 and other expenditures $519,192.79, a total of $2,390,349.20.

Communication.—State highways in 1941 totalled 1,780 mi.; state-aid highways, 2,726 mi.; town highways, 9,653 mi., a total of 14,159 mi. Highway expenditures from July 1, 1940 to June 30, 1941 totalled $5,856,365.95. There were 917 mi. of railroads in the state in 1941. Airways mileage, 145, with 11 airports and 3 seaplane ports. Telephones numbered approximately 64,000 in 1941.

Banking and Finance.—There were 41 state banks in Vermont and 40 national banks in 1941. The deposits in the state banks as of June 30, 1941 were $116,837,463.65, with resources of $136,711,860. National bank deposits were $60,074,000, with resources of $70,524,000. There were 11 savings and loan associations, with resources of $2,634,936.65, a figure which does not include the resources of federal savings and loan associations in the state. The total state expenditures in 1941 stood at $25,178,423.19, the revenues at $18,237,261.55, leaving a net deficit of $6,941,161.64, an improvement of $522,656.06 over the financial condition of the preceding year. The gross debt was $11,402,968.82, a decrease of $322,758 from 1940.

Agriculture.—The total crop land harvested in 1940 was approximately 1,093,230 ac., with a value estimated at $18,381,000 for principal crops. The aggregate value of all livestock, poultry and related products was between $38,000,000 and $39,000,000, with milk accounting for more than three-fourths of the total value. The production of maple syrup was 1,080,000 gal.; of maple sugar, 268,000 lbs. Deep snows and lack of deep frost were unfavourable factors in the 1940 maple season, and the cool growing weather hindered most crops. The dry season of 1941 was also unfavourable to crops.

Leading Agricultural Products of Vermont, 1940 and 1939

Crop	1940	1939	Crop	1940	1939
Corn, bu. . . .	2,627,000	3,040,000	Oats, bu. . . .	1,760,000	1,881,000
Potatoes, bu. .	2,142,000	1,950,000	Hay, tons . . .	1,123,000	1,143,000

Manufactures.—The annual value of manufactures is approximately $50,000,000; there are about 57,000 wage earners, to whom $56,000,000 is paid annually in wages. The granite and marble industries are two of the most important, the business valuation of the former being about $8,000,000 and of the latter $2,000,000. High-grade machine tools are manufactured in Springfield, Windsor and other points, giving employment to 8,000 people before the war expansion of 1941.

Mineral Production.—The total value of mineral products in the state for 1939–40 was $12,283,886. Granite products were valued at $7,304,356; slate at $1,948,315; marble at $1,533,824. (L. W. D.)

Veterans Administration.

Insurance.—As of June 30, 1941, there were 613,320 United States government life insurance policies in force, representing $2,567,154,350 of insurance. Monthly payments were being made to 10,626 policyholders for permanent and total disabilities. Disbursements for this type of insurance during the fiscal year 1941 totalled $55,826,658. As of June 30, 1941, monthly payments on yearly renewable term insurance policies were being made to 10,205 permanently and totally disabled veterans and to the beneficiaries of 8,586 deceased veterans. Monthly payments on automatic insurance policies were being made to 240 veterans and the beneficiaries of 45 deceased veterans. Disbursements for term and automatic insurance during the fiscal year 1941 totalled $15,390,560. During the period Oct. 8, 1940 to June 30, 1941, 367,923 applications for national service life insurance, aggregating $1,193,665,500, were approved. A total of 102 death claims were filed during the same period and awards made in 43 of these cases, representing $237,500 of insurance.

Public 861, 76th congress, Oct. 17, 1940, provides for suspension of enforcement of certain civil liabilities of persons serving in the armed forces of the United States. Article IV of the act provides that the government will, on application by the insured, guarantee to commercial insurance companies premiums on insurance carried with such companies by policyholders while in active service. Through June 30, 1941, 10,135 applications for this benefit had been received, of which 6,718, representing $20,015,076 of insurance, had been approved. Certificates issued to insurers guaranteeing premiums totalled 188, aggregating $163,240 of insurance.

Adjusted Compensation.—Work under the World War Adjusted Compensation act, approved May 19, 1924, has been practically completed. As of June 30, 1941, benefits had been extended to 4,121,543 veterans of World War I or the dependents of deceased veterans, approximating $3,766,840,087 in value. In 3,792,509 cases the veterans received adjusted service certificates equivalent to 20-year endowment policies, aggregating $3,709,991,577 in value. Cash payments had been made in 329,034 cases in the sum of $55,067,180. Awards had been made on 242,414 adjusted service certificates which had matured by the subsequent death of the veteran. The face value of these awards approximated $238,871,780. As of June 30, 1941, 3,513,248 applications had been certified for payment under the Adjusted Compensation Payment act, approved Jan. 27, 1936. The amount certified for payment totalled $1,922,574,962. The maturity value of these certificates approximated $3,437,770,885.

Guardianships.—The guardianship load of the veterans administration, June 30, 1941, was 83,439 wards, of whom 43,476 were incompetents and 39,963 minors. The value of estates of these wards approximated $159,370,982.

Army and Navy Pensions.—Table I shows the number of cases on the rolls as of June 30, 1941, and the net disbursements during the fiscal year 1941 from the appropriations "Army and Navy Pensions."

Medical Care and Treatment.—On June 30, 1941, the hospital load of the veterans administration was 58,417 patients, of whom 58,160 were United States veterans, 38 were Allied veterans of World War I, 99 were employees of the Civilian Conservation corps and Work Projects administration, and 120 were miscellaneous beneficiaries. Of the United States veterans, 54,598 were in veterans administration facilities, 2,531 in other government hospitals and 1,031 in state or civil institutions. Approximately 78.53% of these United States veterans were receiving treatment for disabilities not of service origin. During the fiscal year 1941, 9,716 United States veterans were admitted for observation and treatment of tuberculosis, 9,723 for psychotic or mental diseases, 14,124 for other neurological disorders and 153,811 for general medical and surgical conditions. The veteran population in domiciliary status in veterans administration facilities, June 30, 1941, totalled 13,978. Of this number, 9,151 veterans were disabled by general medical and surgical conditions, 4,588 by neuropsychiatric diseases and 239 by tubercular ailments. During the fiscal year 1941 an average of 5,966 veterans eligible for care in veterans administration facilities was cared for in state or territorial homes. These homes are reimbursed by the federal government at the rate of $240 a year for each of such veterans domiciled therein. During the fiscal year 1941 dental care was provided for 32,300 hospital patients, 11,011 domiciliary members and 3,584 out-patients in clinics maintained by the veterans administration. In these clinics, 35,227 new dentures were made and 8,660 repaired. Dental treatment was authorized to private practitioners for 1,876 veterans. During the fiscal period 1,111,589 examinations were made and 1,176,658 treatments were furnished for out-patient purposes in field facilities. Of the examinations, 98% were medical and 2% were dental. Treatments were 91% medical and 9% dental.

Civilian Conservation Corps.—The total authorized strength of the veterans contingent of the Civilian Conservation corps is 27,200, which represents approximately 9% of the corps strength. As of June 30, 1941, there were 20,200 veterans in enrolment status. There have been approximately 213,000 enrolments in the veterans contingent of the corps since the spring of 1933. The total number of veterans and their dependents who have received direct monetary benefits through allotments approximates 550,000.

Co-operative Employment Activities.—The veterans administration maintains personal contact with local representatives of the United States employment service of the Social Security board and other government agencies with regard to employment of veterans. Employment service reports show that on June 30, 1941, the number of unemployed veterans registered for employment was 212,984, as compared with 239,872 June 30, 1940.

Finance.—Table II shows the net disbursements made by the veterans administration during the fiscal year 1941 from all appropriations and trust funds (including adjustments on lapsed appropriations). (F. T. Hi.)

Table I.—*Number of Cases and Disbursements, Fiscal Year 1941*

War	On roll, June 30, 1941	Disbursements, fiscal year 1941
Honour roll—yellow fever experiments		
Living veterans	10	$ 15,000.00
War of 1812		
Deceased veterans	1	240.00
Mexican War		
Deceased veterans	107	65,772.33
Indian Wars—total	5,791	2,908,462.89
Living veterans	1,955	1,504,114.43
Deceased veterans	3,836	1,404,348.46
Civil War—total	44,873	23,173,466.05
Living veterans	1,560	2,049,976.78
Deceased veterans	43,313	21,123,490.17
Spanish-American War—total	213,627	127,357,083.20
Living veterans	153,072	105,273,098.31
Deceased veterans	60,555	22,083,984.89
Regular establishment—total	48,380	17,660,292.84
Living veterans	37,520	14,382,840.09
Deceased veterans	10,860	3,286,452.75
World War of 1914-18—total	543,662	261,939,634.55
Living veterans	424,819	196,676,253.85
Service connected	340,724	169,142,735.47
Nonservice connected	77,478	23,418,546.58
Emergency officers	2,617	4,114,971.80
Deceased veterans	118,843	65,263,380.70
Service connected	96,833	55,458,891.40
Nonservice connected	22,010	9,804,489.21
Grand total—pensions and compensation	856,451	433,128,952.76
Living veterans	618,936	310,002,183.46
Deceased veterans	237,515	113,226,769.30

Table II.—*Net Disbursements from All Appropriations, Fiscal Year 1941*

Purpose	Disbursements
Salaries and expense	$ 99,406,748.86*
Printing and binding	134,734.91
Public Works Administration act of 1938 (allotment to Veterans administration 1938-1941)	1,115,911.65
Hospital and domiciliary facilities and services, Veterans administration	3,425,168.22
Army and navy pensions	433,128,952.76
Military and naval insurance	15,390,559.61
United States government life insurance fund	55,826,658.44†
National service life insurance	7,055.28
Adjusted service certificate fund	2,056,735.71
Adjusted service and dependent pay	399,566.38
Vocational training	—3,646.83‡
Allotments and allowances	—1,365.18‡
General post fund	37,903.71
Funds due incompetent beneficiaries	350,275.79
Personal funds of patients, Veterans administration	2,405,841.86
Miscellaneous	16,310.07
Total	$914,357,411.25

*Includes $1,320,501.22 net disbursements made to other government agencies for care and treatment of Veterans administration beneficiaries.
†Includes encumbrances.
‡Credits.

Veterans of Foreign Wars.

"One Nation Indivisible" provided the theme for the nation-wide program of activities sponsored in 1940–41 by 3,500 local posts and 2,500 ladies' auxiliary units of the Veterans of Foreign Wars of the United States. As the keynote of the 42nd annual national V.F.W. encampment, Aug. 24–29, 1941, at Philadelphia, Pa., the slogan of "Unity for Victory" for 1941–42 won the endorsement of guest speakers Undersecretary of War Robert P. Patterson; the Honourable Joseph E. Davies, former ambassador to Russia and Belgium; Fiorello H. La Guardia, mayor of New York city and United States director of civilian defense; Brigadier General Frank T. Hines, veterans administrator; Brigadier General Lewis B. Hershey, director of selective service; and L. B. Nichols, assistant director of the Federal Bureau of Investigation. Surveying the world situation, the encampment went on record as "wholeheartedly endorsing and supporting those measures taken by the government of the United States of America to defend and perpetuate the American way of life from any and all aggressors."

One of the V.F.W.'s important achievements of the year was the

inauguration and maintenance of a monthly series of radio programs on the general theme "Speak Up for Democracy." Beginning Dec. 11, 1940, on a network of 50 local radio stations, this program gained momentum and popularity until on Oct. 11, 1941 it was broadcast over a total of 434 stations.

Other major V.F.W. programs throughout the year included the sponsorship of the sixth annual high school Americanism essay contest in which approximately 150,000 boys and girls throughout the United States were entered. A series of preliminary elimination contests in schools, cities and states resulted in the selection of winners in each of 48 states, the territory of Hawaii and Alaska, from among whom were selected the essayists to whom a total of $2,000 in cash prizes was awarded. Miss Barbara Maurin, Fergus Falls, Minn., was presented with a gold medal and $1,000 in cash as first prize.

A 42-point Americanism program, also adopted by the Philadelphia encampment, was formulated on the basis of activities sponsored by the local units in their respective communities. These include thousands of welfare projects such as summer camps for underprivileged children, health clinics, instruction classes for adult aliens, observance of patriotic occasions, supervised playgrounds, sponsorship of Boy and Girl Scout troops and hundreds of junior musical units, rifle clubs, bicycle safety clubs, athletic teams and school programs.

Legislative achievements of the year, in behalf of disabled veterans and their dependents, and the widows and orphans of veterans, included public law no. 775 which provides for the entire personnel of the naval reserve or marine corps reserve pensions and other benefits as provided for the personnel of the regular navy or marine corps, in case of disability or death in line of duty. The V.F.W. also supported an amendment to the Selective Service and Training act, which granted the same pay and allowances to enlisted men of the navy as were provided for enlisted men in similar grades in the army and marine corps. Largely to the efforts of the V.F.W. also was credit for enactment of public law no. 801, which, among other provisions, extended credit for military service rendered during time of any war, for railroad employees' retirement purposes. Public law no. 142, also supported by the V.F.W., eliminated the former "relative needs test" and granted veterans preference on WPA projects. It further provided that receipt of small pensions or compensations would no longer bar veterans from WPA work preference.

Officers elected for 1941–42 include Max Singer, Boston, Mass., commander-in-chief; Robert T. Merrill, Havre, Mont., senior vice commander-in-chief; Carl J. Schoeninger, Detroit, Mich., junior vice commander-in-chief; R. B. Handy, Jr., Kansas City, Mo., adjutant quartermaster general; Philip O. Solon, Oakland, Calif., judge advocate general; the Rev. Hugh Leo Collins, Youngstown, O., national chaplain; Dr. Meredith I. Samuel, Wilmington, Del., surgeon general; Jean A. Brunner, Brooklyn, N.Y., chief of staff; C. R. Christie, Seattle, Wash., inspector general; R. E. Kernodle, Kansas City, Mo., national historian; Teller Ammons, Denver, Colo., national patriotic instructor. (B. Y.)

Veterinary Medicine.

Bovine Tuberculosis.—Livestock sanitary officials in the U.S. found it imperative to warn the people that tuberculosis of farm animals still exists and therefore requires continuous vigilance to prevent the infection from flaring up and reassuming its predaceous character.

In 1941 the secretary of agriculture forbade officers and employees of the U.S. department of agriculture to participate in recruiting members for and organizing general farm societies. Since 1920, county farm advisers have been acting as promotional, financial and business agents for local farm bureaus, functions which have led to the selling of remedies for livestock on a large scale in some states, to the practice of veterinary medicine in violation of state licensure laws in some instances and in violation of the federal law under which the extension service was created. The veterinary profession interpreted the memorandum as a step toward a more scientific control of the farm-animal diseases which threatened to diminish the United States food supply.

Military Service.—The college-trained veterinarians of the United States were well deployed for protecting the nation's food-producing animals against panzootics in times of peace. The number required to guard animal health in the vast farm-animal population would be too few if many of the United States 12,500 veterinarians were inducted into the army from the rural districts. The interruption of animal disease control and food inspection by drafting soldiers from the veterinary service was therefore disapproved by the Selective Service system. The drafting of veterinarians engaged in the treatment of dogs and of those unnecessary in rural districts was left to the discretion of the local draft boards.

Bovine Brucellosis.—The control of brucellosis of cattle (contagious abortion) by vaccination with an attenuated strain of Brucella abortus worked out in the research laboratory of the U.S. bureau of animal industry, was among the new steps in force to lower the incidence of abortion in farm animals.

The vaccination of prepubescent cattle (calfhood vaccination) in addition to the test-and-slaughter method which was so effective in controlling bovine tuberculosis was being slowly introduced under official supervision. The situation, however, was complicated by serological reactions in vaccinated cattle. Since vaccinated cattle cannot be differentiated from spontaneously infected ones, vaccination obstructed free exchange of cattle between states having laws prohibiting the importation of brucella-infected animals. Healthy, but vaccinated cattle, and naturally infected ones were in the same category in interstate trade.

Veterinary Education.—The shortage of veterinarians caused by the closing of the proprietary veterinary colleges in the 1920s and the expansion of the federal and states livestock sanitary services, including extension of municipal milk inspection under the standard milk ordinance of the U.S. public health service, was being gradually overcome by enlarging the capacity of the publicly supported departments of veterinary medicine and the founding of new ones.

The University of California established a division of veterinary medicine which opened with the college year of 1941. The course is six collegiate years, two preveterinary and four professional, an increment of one year over the other ten American veterinary colleges. A wholesome trend was the disapproval of new veterinary colleges which did not comply with the dogmatic standards set down by the U.S. bureau of animal industry, the U.S. civil service commission and the American Veterinary Medical association in regard to financial support, physical equipment and sufficient full-time instructors.

Argentine Beef.—A heated controversy arose among cattlemen and veterinarians of the middle west and intermountain regions over the danger of bringing foot-and-mouth disease and certain tropical infections into the U.S.A. through the importation of South American beef and other meat products. Livestock producers were concerned over the competition as well as the sanitary problem involved, and the veterinary service remained girded to prevent the introduction of foreign plagues into the United States' relatively disease-free animal industry. The question is one of great national and international significance and difficult to handle because it involves the welfare of an important industry, the good neighbour policy of the administration and the price of food for the American people.

Equine Encephalomyelitis.—Although statistical data for 1941 were incomplete, the prevalence of this disease was comparatively low. Spreading was promptly checked by vaccination with the chick-embryo vaccine of Wyckoff wherever the infection broke out.

New reservoirs of the virus were discovered and its relation to so-called St. Louis encephalitis was signalized by the U.S. public health service. Natural summer infection in horses occurs concurrently with outbreaks in man. Although the eastern strain of the virus was isolated in 1938 and 1939 in pheasants and pigeons, the western strain, except in man and horses, was found for the first time in other animals, when isolated from the brain of a prairie chicken in North Dakota during an epidemic of encephalitis (human) in the same neighbourhood.

Artificial Ensemination.—A noteworthy development in animal production is the increasing resort to artificial ensemination, particularly in cows. Breeding societies organized for that purpose have become numerous and methods of determining the virility of bulls and of preserving the viability of semen have been greatly improved. Sires of known potency can be purchased and technicians trained in the art can be employed at low per capita cost to the members, and since several cows can be bred from one mating, the sexual life of bulls can be prolonged. The percentage of conceptions obtained is practically the same as from natural coition. Better offspring for owners of small herds who cannot afford to keep bulls of the best types through the year is one of the strikingly apparent advantages of artificial ensemination.

Military Horses and Mules.—Although the exact proportion of transport animals to soldiers is not yet available, facts collected from press reports and veterinary literature indicated that horses and mules were being employed in sizeable numbers for cavalry, artillery and the service of supply. Procurements by the remount service for the U.S. army in training indicated that the animal transportation had a prominent place in modern military organization.

Chronic Streptococcic Mastitis of Cows.—Mastitis of dairy cows affects the quality and quantity of market milk and being located in the depth of the lactating udder safely encased against systemic remedies, local treatment instilled by way of the milk channels was held out as the only hope

of restoring health to the affected glands. Diagnosis is no deterrent. The infected quarters can be quickly detected by simple tests of the milk, but when the percentage of affected cows runs high, sacrificing them for slaughter is out of the question. The very milk supply of the people would be reduced materially. The discovery of effective local, antiseptic treatment during 1941 was therefore an eventful achievement. Three products came into use: gramicidin, an alcohol-soluble substance isolated from a sporulating anaerobic bacillus; a solution of silver oxide, an acridine dye named entozon and iodized mineral oil. These liquids when instilled and kneaded into the recesses of the affected quarter stop the shedding of streptococci in a large percentage of the cases treated and tend to effect permanent cures.

Sulphanilamide.—The "sulpha" compounds have been found to have many uses in animal medicine but they have been declared useless in chronic infections (tuberculosis, brucellosis, actinomycosis, streptococcic mastitis, endometritis). In acute wound infections, surgical peritonitis, puerperal metritis, they are regarded as a near panacea in veterinary practice. Many an erstwhile fatal infection has been conquered by the proper local and internal use of these drugs.

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(L. A. M.)

Vichy. A town of central France, department of Allier, on the right bank of the Allier, 33 mi. southeast of Moulins; pop. (1939) 20,000. Vichy has been well known as a medicinal spa since the latter part of the 17th century; its alkaline waters are especially recommended for diseases of the stomach and the liver, including diabetes and gout. "Vichy" was one of the most popular French table waters.

RESIDENTS OF VICHY lined up in 1941 to get their daily ration of tobacco

The town acquired political significance in the summer of 1940, when the French government, headed by Chief of State Marshal Henri Philippe Pétain (*q.v.*) took up residence there, after Paris had been occupied by the Germans. It was convenient as a seat of government because of the many hotels which could be converted into government buildings or used as residences by officials. What was originally thought of as a makeshift arrangement remained in force during 1941, since the war did not come to an end and the Vichy government did not arrive at any understanding with Hitler which would have made possible the substitution of a permanent peace for the armistice. A considerable amount of "collaboration" was forced on the Vichy regime in 1941; its forces resisted the British in Syria and yielded without a struggle to the Japanese in Indo-China. But a complete passing into the German camp, although often rumoured, had not taken place by the end of 1941. (*See* also FRANCE.) (W. H. CH.)

Victoria. A state of the Australian commonwealth; area 87,884 sq.mi.; pop. (est. Dec. 31, 1940), 1,918,774. Chief towns (pop. Dec. 31, 1939): Melbourne (1,046,750); Geelong (40,100); Ballarat (38,590); Bendigo (30,150). Governor, Maj. Gen. Sir W. J. Dugan.

History.—The Country party government, under the premiership of Albert A. Dunstan, remained in office throughout 1941. Precedence was given to matters concerning the prosecution of war, legislation of a contentious nature being avoided.

Owing to the shortage of refrigerated shipping space, the government decided to increase the capacity of the government cool stores by 400,000 cu.ft., and 150,000 cu.ft. had been completed by Sept. 1941.

Following a severe drought in agricultural areas in 1940, the wheat crop was the lowest since 1914. Conditions improved during the year and dairy production was well maintained. An area of 28,000 acres of flax was planted, and three additional retting mills were erected. The work of salvaging fire-killed timber was continued by the government, and over 400,000,000 feet were recovered.

Industry was working at high pressure on government orders and a new ordnance factory was being built at Bendigo. The dockyard and shipbuilding facilities at Williamstown were being enlarged to enable merchant ships of 10,000 tons to be constructed. Six anti-submarine and mine sweeping vessels were under construction.

Under commonwealth regulations rents were pegged at Dec. 1940 levels, but the state rents board was given power to reduce such rents in cases where they might have risen unreasonably before that date.

Finance.—In 1940–41: revenue £A29,183,000; expenditure £A29,041,000; debt outstanding (June 30, 1941) £A181,219,000.

Communication.—Roads and streets fit for motor traffic (Sept. 30, 1939) 103,929 mi. Railways (1939–40) 4,767 mi. Motor vehicles licensed (1939–40): cars, trucks, etc., 240,912; cycles 25,765. Wireless receiving set licences (March 31, 1941) 360,115. Telephones (June 30, 1939) 208,230.

Agriculture, Manufacturing, Mineral Production.—Production in 1940–41: wheat 13,521,000 bushels; wool 185,000,000 lb.; coal, brown (1939) 3,651,014 tons; gold (1939) 156,522 fine ounces. Industry and labour, 1939–40: factories 9,250; employees 204,494; gross value of output £A174,300,000; unemployment (trade union returns) (March 1941), 3.2%.

(W. D. MA.)

Vincent, George Edgar (1864–1941), U.S. educator, was born March 21 at Rockford, Ill. After his retirement as president of the Rockefeller foundation in 1929, he served in 1931 on President Hoover's Public Works committee which planned a broader federal program to aid employment. In 1935 the Carnegie corporation appointed him chairman of a survey designed to undertake a study of New York hospitals in relation to public health. He died in New York city, Feb. 1. (*See* also *Encyclopædia Britannica.*)

Vincent, Henry Bethuel (1872–1941), U.S. composer, was born Dec. 28 in Denver, Colo. Founder and director of the Erie playhouse, Vincent was composer of more than 100 musical works for piano, organ and orchestra. He wrote an opera and two operettas. He was a well known organist and lecturer at the Chautauqua institute in New York. His musical compositions include *The Prodigal Son*, an oratorio (1902); *The Garden of Kama*, an oriental song cycle (1905); *Indian Days* and *Savageland*, operettas; and *Esperanza*, an opera presented in 1906 in Washington. He was conductor of the Federal Music Project orchestra in 1936–37. He died Jan. 7 at Erie, Pa.

Virginia. The most southerly of the middle Atlantic group of states and one of the original states of the United States; popularly known as "The Old Dominion"; first settled permanently in 1607. Area, 40,815 sq.mi.; pop. (1940) 2,677,773. Of the population, 35·3% were urban and 64·7% rural; an estimate based upon 5% of the census showed a white population of 2,013,723, nonwhite of 664,050. Capital, Richmond (193,042). Other cities include Norfolk (144,332) and Roanoke (69,287).

History.—The general assembly did not meet in 1941. As usual, Democratic nominees for Virginia's three elective offices won in the general election of 1941, with Colgate W. Darden, Jr., as candidate for governor; William M. Tuck for lieutenant governor, and Abram P. Staples for attorney-general for the third successive term. Democrats won 17 contests out of 25 in the house of delegates and three out of the four special elections for vacancies in the state senate. James H. Price was governor in 1941; Saxon W. Holt, lieutenant governor, died in 1940.

COLGATE W. DARDEN, JR. (Dem.), elected governor of Virginia in Nov. 1941

Education.—In 1940–41, elementary school enrolment was 438,738; teaching staff, 11,894; secondary school enrolment, 135,701; teaching staff, 5,660; 299 additional teachers divided their services between the two systems. In the regular 1940–41 session, 3,151 students attended and 267 faculty taught at the University of Virginia, while nine other state-owned institutions of higher learning had enrolment of 12,376 and teaching staff of 1,064.

Public Welfare, Charities, Correction.—For the year ending June 30, 1941, 22,681 persons received $907,555.49 in general relief; a monthly average of 22,767 persons received $10,793,742.73 in WPA funds; 23,424 persons received $2,313,234.02 in old-age assistance; 5,433 dependent children, $947,904.09; 1,218 blind, $155,199.86; and in 1941, 374,325 unemployment compensation cheques were written for $2,961,650. An average daily population of 4,790 were in six penal institutions for adults and 838 were in four industrial schools for juveniles.

Communication.—On Jan. 1, 1941, there were 9,632 mi. in Virginia's primary highway system and 36,745 mi. in the secondary system. Expenditures of the state highway department for the fiscal year ending June 30, 1941, were $24,795,885.29. On Dec. 31, 1941, Virginia had 4,261 mi. of railroad.

Banking and Finance.—On Jan. 1, 1941, Virginia had 184 licensed state banks and 130 national banks. Deposits of the former totalled $276,551,000; of the latter, $423,503,000; assets of state banks, $317,956,000; of national banks, $478,002,000. Resources of 22 industrial loan associations, 58 building and loan associations and 32 credit unions were $42,789,013.89. The state budget for the fiscal year ending June 30, 1941, showed receipts of $96,772,092.47; expenditures of $88,514,494.43; gross debt was $19,214,003.86; net debt, $13,917,054.60.

Agriculture.—The value of principal Virginia crops in 1941 was estimated at $115,668,000, an increase of 14% over 1940, although the total acreage harvested, estimated at 3,744,000 ac., was a decrease of 4% under 1940. The estimated farm income in 1941 was 18% higher than in 1940, when the total income was $127,289,000 (crops, $63,534,000; livestock, $59,031,000; government payments, $4,724,000). The extensive drought in 1941 caused a damage of approximately $8,650,000 to Virginia crops.

Table I.—*Leading Agricultural Products of Virginia, 1941 and 1940*

Crop	1941 estimated	1940
Cotton, lint, bales	28,000	25,000
Corn, all, bu.	32,942,000	36,396,000
Apples, commercial, bu.	11,505,000	10,660,000
Wheat, all, bu.	7,665,000	8,168,000
Potatoes, bu.	6,916,000	10,286,000
Sweet potatoes, bu.	2,970,000	3,875,000
Oats, bu.	2,625,000	2,619,000
Peaches, bu.	2,017,000	1,392,000
Barley, bu.	1,800,000	2,160,000
Peanuts for nuts, lbs.	169,200,000	215,670,000
Tobacco, lbs.	91,122,000	100,509,000
Hay, all tame, tons	1,250,000	1,492,000

Manufacturing.—The total value of manufactures in 1940 was $1,255,354,533; 194,662 wage earners were paid $184,506,965.

Table II.—*Principal Industries of Virginia, 1940 and 1938*

Industry	Value of products	
	1940	1938
Tobacco products	$424,198,041	$377,124,411
Transportation equipment	183,784,622	92,149,029
Textiles and their products	179,711,490	119,512,362
Food and kindred products	135,308,438	114,798,308
Paper and printing	96,924,436	68,170,599
Wood products	79,869,851	53,876,609
Chemical products	73,131,229	60,905,257
Metals and machinery	38,787,922	24,748,367
Stone, clay and glass products	20,081,586	13,766,843
Leather and its products	17,611,003	15,901,358

Mineral Production.—The total value of mineral production in 1940 was $37,670,935; 19,057 wage earners were paid $20,382,889.

Table III.—*Principal Mineral Products of Virginia, 1940 and 1938*

Mineral	Value of products	
	1940	1938
Coal	$27,103,764	$22,578,035
Coke	928,239	664,550

(J.S.Bk.)

Virginia, University of. A state institution for higher education at Charlottesville, Va. The original university was designed and built by Thomas Jefferson. There are six departments: two academic— the college and department of graduate studies; and four professional— law, medicine, engineering and education. The institution has a productive endowment fund amounting to $11,512,570, and received from the state an annual appropriation of $565,938 (1940–41).

The total budget for 1941–42 was $2,845,347. The corporate name of the university is "The Rector and Visitors of the University of Virginia."

In 1941 the faculty and officers numbered 366 (professors and instructors); the students 2,992 (103 women; 2,889 men). Number of books in the library, 360,000, July 1941.

(J. L. N.)

Virgin Islands. A United States dependency in the West Indies, east of Puerto Rico, comprising St. Croix (pop. 12,902), St. Thomas (11,265) and St. John (722) islands. Area: 133 sq.mi. The population by the 1940 census was 24,889, a 13·1% increase from 1930, reversing a half-century steady decline, with whites 9%, Negroes 69% (1930: 78·3%), "mixed and other races" 22% (1930: 12½%). The chief cities are: Charlotte Amalie, the capital, on St. Thomas, 9,801 (1930: 7,036); Christiansted, 4,495 (3,767) and Frederiksted, 2,498 (2,698) on St. Croix.

Legislative functions are vested in the municipal councils of St. Croix and St. Thomas; the governor is appointed by the president of the United States. On Jan. 6, 1941, Charles Harwood was named governor.

History.—The dominant feature in the Virgin Islands' history in 1941 continued to be the dependency's development as a major

link in U.S. Caribbean defenses. Economically, the islands were strongly affected by general war conditions. Withdrawal of cruise ships and consequent loss of tourist trade was offset by enhanced U.S. army and navy spending and by increased ship bunkering and freight transshipment, especially of bauxite. Similarly, effects of the rehabilitation program of the 1930s were felt, especially in greater demand for handwork.

Education.—In 1940–41, 26 elementary schools had 3,281 enrolment (including 1,471 in eight accredited private schools), and three high schools 750. In 1940 (United States census), illiteracy of persons 10 years of age and over was 13.4% (1930: 16.1%), with whites 12.6% (17.9%), Negroes 14.8% (17%), mixed and others 9.2% (8.9%).

Finance.—The monetary unit is the United States dollar. An annual United States government subsidy is made to assist in defraying government expenses.

Trade.—Official policy, enunciated in 1941, was to withhold complete trade statistics. Virgin Islands imports from the United States (normally 60–75% of the total) in 1940 were valued at $3,023,979 (1939: $2,487,805); exports (normally around 95% of the total) $1,448,020 (1939: $1,558,523), and in the first nine months of 1941, $3,003,200 (Jan.–Sept. 1940: $1,958,993) and $1,725,053 ($1,029,950), respectively. Rum and sugar provide most of the export values.

Communication.—External communication is by steamer and Pan American Airways, through Charlotte Amalie. In 1940–41, 1,220 vessels called at Charlotte Amalie (1939–40: 985; 1931–40 average: 659).

Agriculture.—St. Thomas depends on both shipping and agriculture (fruits and vegetables), St. Croix and St. John on agriculture. In 1940 (census report) 828 "farms" of 3 ac. or more totalled 55,228 ac. (1930: 329, totalling 68,322 ac.). St. Croix had 610 farms (38,953 ac.), St. Thomas 188 (10,419 ac.), St. John 30 (5,855 ac.). St. Croix (1938: 4,078 ac.: 1929: 5,820 ac.) produces practically the entire sugar crop. Other crops are diversified vegetables and tree crops (guava, cacao, coconuts, limes, lemons, oranges).

Manufacturing.—Under federal government stimulus, handwork and other local manufactures increased greatly. Handwork production rose 42% from 1940 to 1941.

(L. W. BE:)

Virgin Islands, British: *see* WEST INDIES, BRITISH.

Viruses: *see* EPIDEMICS AND PUBLIC HEALTH CONTROL; INFANTILE PARALYSIS; MEDICINE; VETERINARY MEDICINE.

Vital Statistics: *see* BIRTH STATISTICS; DEATH STATISTICS; INFANT MORTALITY; MARRIAGE AND DIVORCE; SUICIDE STATISTICS; CENSUS, 1940.

Vitamins.

A number of years ago the interesting observation was made that the feeding of large amounts of raw egg white to experimental rats resulted in a severe nutritional deficiency, analogous in many respects to acrodynia of infants. This condition in animals could be prevented by heating the egg white, thus coagulating the proteins, or by feeding large amounts of yeast. Further work by Parsons and by György led to the view that egg-white injury, as it came to be called, was a vitamin deficiency. It was not until 1941, however, that three groups of investigators, led by György, Williams and du Vigneaud were able to explain the phenomenon. It now appears that there is in egg white a protein called avidalbumin or avidin, which unites with biotin to form a complex that cannot be absorbed from the intestinal tract. Hence, animals fed uncoagulated egg white may suffer from a deficiency of biotin. Heating the egg white presumably decomposes the biotin-avidin complex. Biotin, which is a member of the vitamin B complex, was prepared in crystalline form and was found to have a composition that corresponds to the empirical formula $C_{10}H_{16}O_3N_2S$. The titration curve indicated that the substance is a mono-carboxylic acid. The functions of this substance in human nutrition were in 1941 unknown.

It is of interest that the biotin content of egg yolk was great enough to more than compensate for the avidin content of the white.

It is well known that animals on deficient diets frequently exhibit abnormal conditions of their fur. Black-coated rats fed a milk diet turn gray, and the normal color is restored by administration of iron and copper, elements which are present in deficient amounts in milk. Another type of graying was observed by Agnes Fay Morgan as a result of maintaining black-coated animals on a diet that did not contain all of the members of the vitamin B complex. The pantothenic acid was known in 1941 to be the factor primarily concerned in this condition—nutritional achromotrichia. Animals fed on diets lacking in pantothenic acid, but otherwise complete, developed graying of the hair in about six weeks or less and the normal colour could be restored by administration of suitable amounts of the missing vitamin. Some interest was aroused by reports that para-aminobenzoic acid is a factor involved in the maintenance of normal colour in animals with pigmented fur. This substance was shown to be the material in yeast which counteracts the bacteriostatic action of sulphanilamide. Ansbacher reported that para-aminobenzoic acid, which others have isolated in pure form from yeast, is a growth factor for the chicken and a factor which prevents graying of the hair in black rats. Several investigators were unable to confirm Ansbacher's observations about the relationship of this substance to the prevention or cure of gray hair in animals. There was therefore little rationale to the report by Sieve that the administration of comparatively large amounts of para-aminobenzoic acid to persons with gray hair would result in darkening of the hair. It was hardly likely that persons whose hair was gray were necessarily suffering from any vitamin deficiency. If para-aminobenzoic acid darkens the hair, the explanation of its action was in 1941 unknown.

Inositol is a water soluble substance found in muscle tissue, especially in the muscle of the heart, and elsewhere in the body. It had long been known that this substance was of importance in the growth of yeast cells. Woolley found that white mice fed on synthetic diets containing all of the known vitamins lost much of their hair unless inositol was added to their diets. Other workers, however, showed that other strains of mice, such as the Rockland strain of black mice used by Martin, did not develop alopecia on a diet lacking inositol.

It was apparent that much more work needed to be done on the biochemistry and physiology of the various factors of the vitamin B complex. One interesting contribution was made by Elvehjem and his collaborators, who showed that the riboflavin requirements of experimental animals increased as the fat content of the diet was increased. It might be that riboflavin is involved in the intermediary metabolism of fat. These investigators, however, pointed out that it was also possible that increasing the fat produced a change in the bacterial flora of the intestinal tract, which might synthesize or consume riboflavin, or produce an adverse effect on the absorption of riboflavin.

Vitamin Deficiency.—Important work continued to be done on the detection of mild degrees of vitamin deficiency in man. A most significant contribution in this connection was that by H. D. Kruse who, by means of biomicroscopic examination combined with gross examination was able to detect in the eye early pathological changes that were indicative of vitamin A deficiency. These included drying of the conjunctiva, the appearance of Bitôt's spots and corneal changes leading to ulceration and definite kerotomalacia. It was especially significant that in examining 143 persons in a low income group, he found 45% to have gross lesions and another 54% to have the microscopic ocular lesions which he believed were caused by lack of sufficient vitamin A. Administration of vitamin A led to a recession or disappearance of the conjunctival lesions. A long period of time was required for complete recovery, a matter of months even with large amounts of vitamin A. If these observations would be confirmed, it would mean that vitamin A deficiency is much more extensive than had been supposed hitherto.

Other studies of vitamin A deficiency by use of the biophotometer, the Hecht adaptometer, and chemical determinations of the carotene and vitamin A content of the blood were continued and showed that the inclusion of adequate amounts of vitamin A in the diet doubtless is a major nutritional problem. No uniformity of opinion resulted, however, as to the best method for assessing the vitamin A status of persons. Jeans, who pioneered in these efforts to find a measure of the vitamin A nutrition of human beings, carefully re-evaluated the biophotometer method and reported that about one-fifth of the school children examined by him in Iowa had poor adaptation to dim light of such a degree that they could be considered as being deficient in vitamin A. Recovery following the administration of vitamin A was slow.

Lund and Crandon reported further observations on induced vitamin C deficiency in man. In addition to low values for the ascorbic acid content of the blood, the appearance of petechial haemorrhages in the skin and some of the other signs of vitamin C deficiency, they found an extraordinary retardation of the rate of healing of wounds.

Vitamins in Foods.—Improvements continued to be made in the development of rapid methods for the determination of vitamins in foods. Except for a few specific items which were fairly well studied, it was generally conceded that this work had not yet progressed to the point where it could replace the more tedious bioassays with animals. In the case of nicotinic acid, however, there was in 1941 no suitable and convenient bioassay method and it was important therefore that shorter methods of precision had been developed for the accurate determination of this dietary essential. By these newer methods, Elvehjem showed that white flour contained more nicotinic acid than had been supposed hitherto. Even without the addition of nicotinic acid, most ordinary white flour contained nearly as much nicotinic acid as the minimum level of enriched flour, according to the specifications of the Food and Drug administration of the United States. As a result, it was likely that new standards for the amount of nicotinic acid to be added to flour would have to be formulated. At the end of the year, a committee of the National Research Council, Washington, D.C., acting at the request of numerous persons, suggested the adoption of the terms "niacin" and "niacin amide" in place of nicotinic acid and nicotinic acid amide, respectively. These shorter synonyms undoubtedly would be used to a large extent by food manufacturers in place of the longer terms which frequently proved confusing to the public because of the seeming relationship to nicotine.

In the United States flour, to be entitled to the designation "enriched," had to contain added thiamin, nicotinic acid and iron. Later, riboflavin would be required. In Great Britain, specifications for national flour required that the flour consist of about 85% of the wheat grain, instead of the usual 70%. Bread made from such flour had a darker colour than ordinary white bread, but it supplied more of the important dietary essentials found in whole grains. The enriched bread of the United States was almost equal nutritionally to whole wheat bread. (*See* also ALIMENTARY SYSTEM, DISORDERS OF; BIOCHEMISTRY; CHEMISTRY; CHEMOTHERAPY; DENTISTRY; DERMATOLOGY; DIETETICS; EYE, DISEASES OF; FLOUR AND FLOUR MILLING; GYNAECOLOGY AND OBSTETRICS; LEPROSY; MEDICINE;

NERVOUS SYSTEM; PHYSIOLOGY.)

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Vocational Education: *see* EDUCATION.

Von (in personal names): *see* under proper names.

Voroshilov, Klementiy E.

(1881–), Russian army officer, was born Feb. 4 in Verkhnyi, Ukraine. In 1903, he joined the Social-Democratic party. He was exiled to Archangel in 1907 for revolutionary activities but escaped to Baku. During World War I, he was a revolutionary organizer, but after the Bolsheviks seized power he entered active military life. In 1917, he was made defense chairman of Petrograd and helped Dzerzhinsky organize the Cheka, forerunner of the G.P.U. (Russian secret police). He led guerrilla detachments against German armies in the Ukraine in 1918. He was people's commissar of the army and navy in 1925 and has been a member of the communist party central committee since 1921. On May 8, 1940, Voroshilov was named vice-premier and Marshal Timoshenko (*q.v.*) succeeded him as defense commissar. In Aug. 1941, Marshal Voroshilov was in command of the northwestern front which included Leningrad and in Oct. 1941, he was charged with formation of new Russian armies. A Berne dispatch dated Dec. 23, 1941, said Voroshilov had been appointed commander of the red army in eastern Asia.

Wages and Hours.

During 1941 employment and pay rolls in manufacturing and non-manufacturing industries improved substantially as a result of European war orders and the U.S. defense program. The improvement was particularly noticeable during the latter part of 1940 and proceeded continuously to higher and higher levels in 1941. Advance newspaper releases from the bureau of labour statistics gave an employment index for San Diego of 467·5 for Nov. 1941 (1937=100). Wichita, Kan. was 271·9 and Seattle 215·2. Sixteen cities had employment indexes above 150, though seven cities had lower employment indexes than in Sept. 1937. Table I shows the employment indexes for 1940 and the first nine months of 1941. Table I and Table II show improved employment and higher average weekly earnings during the first half of 1941 as compared with the first half of 1939. Figures for the latter half of 1941 were expected to show improvement.

Employment during the first nine months of 1941 was about 20% better than during the corresponding months of 1940 (Table I). This was caused principally by the improvement in employment in the durable goods industries where employment increased more than 25% over the corresponding months in 1940. This rise in durable goods employment continued during the latter half of 1941.

During the period 1937–39 average hourly earnings increased. This was an unusual event. In periods of increased unemployment, such as prevailed from late 1937 through 1938, labour ordinarily experiences reductions rather than increases in average hourly earnings. The contra-cyclical rise in hourly earnings 1937–39 appears to have been the result principally of the upsurge

Table I.—*Employment, Pay Rolls and Earnings in Manufacturing Industries in the U.S.*

(Indexes are based on 3-year average, 1923–25=100, and are adjusted to preliminary 1939 census of manufacturers. Not comparable to indexes published by the U.S. Bureau of Labor Statistics prior to August 1939.)

	All Manufacturers				Durable Goods				Nondurable Goods			
	Employment		Pay Rolls		Employment		Pay Rolls		Employment		Pay Rolls	
	1941	1940	1941	1940	1941	1940	1941	1940	1941	1940	1941	1940
Jan.	115.5	101.4	120.7	98.3	118.3	97.4	132.0	98.2	112.7	105.3	108.1	98.4
Feb.	117.8	101.4	126.8	97.8	121.0	96.6	139.2	96.7	114.7	106.1	112.9	99.1
Mar.	119.9	100.8	131.2	98.2	123.7	96.4	144.6	97.6	116.3	105.1	116.3	99.0
Apr.	122.6	99.6	134.7	96.3	127.7	96.0	149.9	97.2	117.8	103.0	117.7	95.4
May	124.8	99.0	144.0	96.3	131.2	96.5	163.0	97.5	118.7	101.5	122.7	94.9
June	127.9	99.4	152.2	97.9	135.1	97.0	173.9	100.0	121.1	101.7	127.9	95.5
July	130.7	99.5	152.7	96.5	137.7	95.6	172.4	96.0	123.9	103.3	130.8	97.1
Aug.	133.0	103.8	158.3	104.0	138.7	99.8	177.9	105.5	127.7	107.6	136.3	102.4
Sept.	135.3	107.7	163.0	110.1	142.2	105.5	184.0	114.1	128.7	109.8	139.5	105.6
Oct.		113.8		116.2		112.8		123.4		114.8		108.1
Nov.		114.7		116.4		115.5		125.1		113.9		106.6
Dec.		116.2		122.4		117.0		131.0		114.8		112.1

This table compiled from tables published monthly in the *Monthly Labor Review*, United States Bureau of Labor Statistics.

of unionism which began in 1933–34. By 1937 a large number of the new unions had become sufficiently consolidated and effective, and the older unions sufficiently strengthened, so that their increased bargaining power more than counterbalanced the temporarily adverse business trend of late 1937 and 1938 and enabled them, both in union and nonunion industries, to push the wage level higher. In the first half of 1940 the higher hourly earnings were maintained but not increased in the majority of industries. Table II shows that hourly earnings rose gradually and with increasing rapidity in late 1940 and in 1941, both because of increases in rates and because of overtime.

The bureau of labour statistics figures show a downward trend of hours in most industries, from 1937 to 1939 because of reduction in hours-standards effected by union agreements. But in 1940 and 1941 average hours increased, particularly in the heavy industries, because so much overtime was worked as a result of the war.

The much higher hourly earnings in some industries are due to one or more of the following factors: (1) character of the labour supply employed, as to sex, age and skill, (2) productivity of the industry, principally determined by its degree of modernization, technical equipment and proportion of skilled workers, (3) degree to which union working conditions prevail, (4) necessity of paying high wages to attract labour supply.

Weekly earnings are really of greater significance than hourly rates, from the point of view of living standards. There were only eight industries of the 24 studied in which average weekly earnings exceeded $30 per week in July 1940, and the maximum was $34.75 in electric light and power industries. The lowest weekly earnings were in hotels: $15.54. In July 1941, there were 15 industries in which average weekly earnings exceeded $30. Three of these were: $40.51 in transportation equipment; $37.51 in machinery; and $36.05 in crude petroleum. The lowest, hotels, were but $16.03. The average weekly earnings of durable goods manufacturers were $35·83 in July 1941 compared with $28.52 a year earlier and $26.40 in 1939.

Five industries fell between $20 and $25 per week and four between $25 and $30; two below $20 in July 1941.

The wages of farm labour were higher in 1941 than in 1940, judging by the reports of the U.S. bureau of agricultural economics.

Monthly wages, with board, averaged $28.77 on Oct. 1, 1940, and $37.45 on Oct. 1, 1941; daily wages, with board, $1.39 on Oct. 1, 1940 and $1.88 on Oct. 1, 1941. (*See* also AGRICULTURE; BUSINESS REVIEW; CANADA: *War Price and Wage Control;* LAW: *Labour.*) (D. D. L.)

Great Britain.—The latest available detailed figures of earnings relate to July 1940 and covered 15 industries. In these industries, weekly earnings averaged, for all workers, 53/3*d.* in Oct. 1938 and 69/2*d.* in July 1940—a rise of nearly 30%. But employment, and therewith weekly earnings, improved between Oct. 1938 and the outbreak of war (though wage *rates*, as distinct from earnings, rose by less than 1% over this period); and July 1940 was a period of abnormally heavy overtime, following upon the disaster in France, so that earnings were larger then than a few months later, when the uneconomic character of much of this overtime work had been realized. Therefore, wage *rates*, as distinct from earnings, rose on the average by only about 10% at most between Sept. 1939 and July 1940; and 20% would be a better guess than 30% for the rise in earnings, apart from the abnormal overtime.

The 30% average rise in earnings up to July 1940 shown by the crude figures was unevenly distributed both between industries and between men and women. Men's earnings rose by 29% or 30% and women's by less than 20%. Boys and youths showed the biggest rise—one of 34½%. Earnings naturally increased most in the metal and engineering trades (men 37%, women 31½%, boys and youths over 40%). At the other extreme, men's earnings in the printing and kindred trades actually fell, owing to slackness of work, and earnings in the clothing industry rose by only 12% for men and 10½% for women. The building trades and the government factories showed the largest increases, after the metal and engineering group.

The only available method of bringing up these figures to the end of 1941 is by using the published monthly statements of changes in *rates* of wages —not earnings—in the principal industries. During the first eight months of 1941 there was in the industries covered by the available statistics a total net increase of about £1,500,000 a week in the wages of about 7,300,000 workers. This compares with an increase of about £1,700,000 a week in the wages of about 7,450,000 workers during the corresponding months of 1940. In other words, wage rates continued to advance in 1941 at about the same moderate pace as in 1940.

Table II.—*Average Hours per Week, Average Earnings per Hour, and Average Weekly Earnings in Major Industrial Classifications, January and July, 1941 and 1940 in the U.S.*
(Compiled from the *Monthly Labor Review* of the United States Bureau of Labor Statistics)

Industry	Average Hours per Week				Average Earnings per Hour				Average Earnings per Week			
	1941		1940		1941		1940		1941		1940	
	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July
ALL MANUFACTURING INDUSTRIES	39.0	40.3	37.4	37.3	Cents 68.9	Cents 74.4	Cents 66.3	Cents 66.7	$27.71	$31.24	$25.51	$25.25
Durable Goods	40.6	41.5	38.1	37.9	75.8	82.6	72.7	72.7	31.90	35.83	28.96	28.52
Nondurable Goods	37.3	39.0	36.9	36.7	62.0	65.7	60.7	61.5	22.64	25.12	21.87	21.87
Iron and Steel (not including machinery)	39.8	39.9	37.6	37.2	78.6	86.2	76.6	77.7	31.46	35.49	29.07	28.89
Machinery	43.2	44.6	40.4	40.5	76.8	83.6	73.5	74.4	33.35	37.51	29.74	30.29
Transportation equipment	40.4	41.2	37.4	36.2	91.1	98.8	89.4	89.1	36.57	40.51	33.23	31.88
Nonferrous metals	41.4	42.0	39.2	38.6	74 0	80.3	70.1	70.1	30.71	33.81	27.37	27.12
Lumber and products	38.9	39.9	36.9	37.0	52.9	57.7	51.2	51.9	20.72	23.21	19.10	19.37
Stone, Clay, Glass	36.5	37.4	35.1	35.5	68.2	72.0	66.4	66.5	25.17	26.97	23.58	23.55
Textiles and products	35.7	37.4	34.8	33.8	51.2	55.0	49.9	50.2	18.13	20.54	17.26	16.85
Leather and products	37.3	38.7	37.2	35.9	55.5	60.9	53.4	55.3	20.67	23.68	19.89	19.80
Food and kindred products	39.0	41.1	39.7	39.9	64.9	66.1	64.1	62.4	24.89	26.63	25.32	24.33
Tobacco manufactures	35.7	37.3	33.3	36.8	49.8	52.3	49.6	50.2	17.76	19.45	16.52	18.36
Paper and printing	38.8	39.6	38.1	38.0	80.2	82.5	78.4	79.1	29.75	31.70	28.66	29.00
Chemicals and petroleum refining	38.9	40.0	38.4	38.5	77.0	83 8	75.6	78.3	30.31	33.81	29.22	30.12
Rubber products	39.0	39.2	36.6	35.7	78.8	84.5	77.6	78.5	30.85	33.18	28.54	27.90
NONMANUFACTURING												
Coal Mining:												
Anthracite	27.0	23.2	36.8	26.3	92.5	99.8	91.9	91.8	25.13	23.25	33.46	23.52
Bituminous	29.7	28.7	29.4	26.6	88.5	102.8	87.6	89.1	26.00	31.22	25.71	23.65
Metalliferous mining	40.7	39.6	40.6	38.0	74.8	79.5	73.5	72.2	30.31	31.62	29.68	27.34
Quarrying and nonmetallic mining	38.2	42.0	34.9	39.8	57.6	63.5	56.3	56.8	22.06	26.67	19.66	22.63
Crude petroleum	37.8	38.1	37.5	38.0	88.3	93.0	88.8	87.6	33.27	36.05	33.99	33.92
Telephone and telegraph	39.7	40.5	39.2	40.0	80.4	79 6	80.5	79.8	31.69	32.04	31.79	31.75
Electric light, power and gas	39.4	39 9	39.1	39.1	90.3	91.9	88.7	89.1	35.49	36.50	34.63	34.75
Wholesale trade	40.6	40.9	40.6	41.0	75.0	79.7	72.9	74.0	30.59	32.45	29.65	30.41
Retail trade	42.7	42.6	43.0	43.0	54.5	57.4	54.1	55.3	21.53	22.54	21.43	21.68
Hotels (year-round)	45.9	46.1	46.2	46.7	33 8	34.6	33.2	33.1	15.05	16.03	15.39	15.54
Building	32.6	35.4	30.8	33.6	98.6	100.0	97.0	94.7	32.10	35.38	29.74	31.78

These increases have to be considered against the background of a rising cost of living. In August 1939 the cost of living index stood at 155 (August 1914=100). By July 1940 it had advanced to 187, and by August 1941 to 199.

The advance was retarded, especially during 1941, by government subsidies designed to stabilize the cost of some of the principal articles of working-class diet, as well as by more general measures of price control.

There was considerable controversy over wage policy. In June the government issued a White Paper explaining that the policy of stabilizing the prices of certain necessaries had been deliberately adopted to avoid inflation, that the shortage of supplies called for reduced consumption, not only of rationed but of unrationed goods, and urging that, save in exceptional cases, wages should be increased further only when the increase was linked with a rise in output, to avoid higher costs. The recognized exceptions were readjustments in the wages of "comparatively low-paid grades" or changes "owing to changes in the form, method or volume of production." The government's policy, however, was to leave the regulation of wages to be dealt with by the traditional and well-tried practices of collective bargaining, under which advances in wages had in fact been reasonable.

The Trades Union congress, in reply, argued that the government was endeavouring to influence wage-fixing bodies against granting increases, while pretending to leave wages unregulated by the state. The danger of inflation was admitted; but it was contended that the provision made for increases to the worse-paid workers was quite inadequate, and that, by the government's own admission, wage advances had been "reasonable"; the trade unions held that there was no reason for a change in the government's policy of nonintervention. They refused to join the government in any public statement based on the White Paper, and reserved their freedom of action.

The remaining significant development was the grant of the "guaranteed week" to a number of classes of workers who were subjected to special disciplinary conditions of war work. The dockers who were formed into special squads for work at any port were the most important of these groups.

There was much dissatisfaction over agricultural wages, especially since agricultural labourers were tied to the land as essential workers. In most counties weekly rates were advanced by a few shillings above the 48/— national minimum rates granted in 1940. But the claim for a minimum of 60/— was rejected. In other trades in which wages are statutorily regulated there were moderate advances.

Normal hours of labour were left unchanged in nearly all trades. (*See* also LABOUR UNIONS.) (G. D. H. C.)

Table III.—*Rise in Hourly Earnings Rates in U.S.A., 1939–41*

Industry	Hourly earnings in January		
	1939	1940	1941
Manufactures in general	$.651	$.663	$.689
Durable goods manufactures	.729	.727	.758
Nondurable goods	.585	.607	.620
Iron and steel	.755	.766	.786
Machinery	.724	.735	.768
Lumber and products	.541	.512	.529
Food and kindred products	.628	.641	.649
Tobacco products	.481	.496	.498
Rubber products	.768	.776	.788
Anthracite mining	.928	.919	.925
Bituminous mining	.883	.876	.885
Wholesale trade	.707	.729	.750
Building	.932	.970	.986

Wakefield, Charles Cheers Wakefield,

1ST VISCOUNT, of Hythe (1859–1941), British philanthropist and business executive, was born in December in Liverpool. His father, a civil servant, wanted the boy to follow in his footsteps, but the son entered a business career and became one of the richest oil magnates in England. In 1915 he became lord mayor of London, and two years later he received a baronetcy. He was a patron of the arts and a generous contributor to hospitals and charities. Known as the "father of English aviation," he was associated with nearly every important event in flying from 1905. He backed many flights, including several record-breaking air voyages by Sir Alan Cobham and Amy Johnson. He also financed efforts by Sir Henry Segrave, Sir Malcolm Campbell, Capt. George Eyston and Kaye Don to set new records for racing cars and speedboats. Elevated to the peerage in 1929, he was made a viscount in 1934. He died Jan. 15 at his home in Beaconsfield, England.

Wake Island.

A mid-Pacific atoll some 2,600 acres in area, owned by the United States of America since 1899, Wake Island lies in latitude 19° 15′ N., longitude 166° 38′ E. It is about 2,104 miles west of Honolulu, Hawaii and 1,334 miles from Port Apra, Guam. By executive order dated Dec. 29, 1934, Wake island was placed under control and jurisdiction of the navy department. Prior to establishment of the Pan American Airways base, under license from the navy department, Wake had no regular inhabitants.

Wake island was attacked by air and sea Dec. 8, 1941, almost simultaneously with the Japanese attack on Hawaii (the atoll lies west of the international date line). During the next two weeks a small garrison of 385 U.S. marines repulsed a number of separate attacks and, according to a report of the U.S. navy, knocked three Japanese destroyers, a cruiser and a submarine out of action. On Dec. 22, after the last U.S. marine plane had been forced down, the Japanese effected a landing and subdued the remainder of the defending garrison. (G. L. WF.; X.)

Wales: *see* GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Wallace, Henry Agard

(1888–), vice-president of the United States. (See *Encyclopædia Britannica.*) Wallace was secretary of agriculture in the cabinet of Franklin D. Roosevelt from March 4, 1933 until Sept. 5, 1940, when he resigned to campaign for the vice-presidency to which he had been nominated by the Democratic convention in Chicago, Ill., July 19, 1940. After his election Nov. 5 he was named official representative at the inauguration of President Manuel Avila Camacho of Mexico at Mexico City Dec. 1.

Wallace was inaugurated with President Roosevelt Jan. 20, 1941. In the summer of 1941 he became an important figure in the U.S.

defense program.

President Roosevelt appointed him head of the Economic Defense board (later the Economic Warfare board, *q.v.*) on July 31, and chairman of the Supply Priorities and Allocations board (*q.v.*) on Aug. 28.

Walpole, Sir Hugh Seymour (1884–1941), British novelist, was born in Auckland, N.Z., the son of a clergyman. He attended King's school at Canterbury and Emmanuel college, Cambridge. Destined for the clergy, he preached for a time at a water-front mission in Liverpool, but soon discovered he was not cast in the mould of a preacher. He turned to writing and his first novel, *The Wooden Horse,* was published in 1909. His literary career was temporarily interrupted by the war of 1914–18, at the outbreak of which he joined the Russian Red Cross.

After the war, Walpole established his success as a novelist with *The Secret City* (1919), which won him the James Tait Black prize. In addition to turning out novels at the rate of one a year, Walpole also wrote short stories, children's tales and plays.

He was knighted in 1937. Among his books are *Maradick at Forty* (1910); *Mr. Perrin and Mr. Traill* (1911); *The Prelude to Adventure* (1912); *The Duchess of Wrexe* (1914); *The Young Enchanted* (1922); *The Cathedral* (1922); the Jeremy series, which includes *Jeremy* (1919), *Jeremy and Hamlet* (1923) and *Jeremy at Crale* (1927); the Herries series, which was adapted to screen, stage and radio, includes *Rogue Herries* (1930), *Judith Paris* (1931), *The Fortress* (1932), *Vanessa* (1933) and *Bright Pavilions* (1940); *Wintersmoon* (1928); *The Inquisitor* (1935); and *Blind Man's House* (1941). His plays were *The Cathedral* (1932); *The Young Huntress* (1933); and *The Haxtons* (1939). He died at his home, Brackenburn, near Keswick, in the lake district, England, June 1.

War Debts. A statement follows showing the indebtedness of foreign governments to the United States as of June 30, 1941:

Country	Principal	Accrued Interest	Total Indebtedness
Funded debts:			
Belgium	$ 400,680,000.00	$ 69,524,713.74	$ 470,204,713.74
Czechoslovakia	165,241,108.90	614,608.97	165,855,717.87
Estonia	16,466,012.87	5,727,233.41	22,193,246.28
Finland	8,039,601.83	373,442.70	8,413,044.53
France	3,863,650,000.00	434,108,632.70	4,297,758,632.70
Germany (Austrian indebtedness)[1]	25,980,480.66	40,098.78	26,020,579.44
Great Britain	4,368,000,000.00	1,437,850,288.81	5,805,850,288.81
Greece	31,516,000.00	3,598,880.32	35,114,880.32
Hungary	1,908,560.00	585,591.10	2,494,151.10
Italy	2,004,900,000.00	27,182,255.48	2,032,082,255.48
Latvia	6,879,464.20	2,275,164.25	9,154,628.45
Lithuania	6,197,682.00	2,001,072.04	8,198,754.04
Poland	206,057,000.00	71,674,410.31	277,731,410.31
Rumania	63,860,560.43	3,794,134.96	67,654,695.39
Yugoslavia	61,625,000.00	539.21 .78	62,164,218.78
Total	$11,231,001,470.89	$2,050,889 746.35	$13,290,891,217.24
Unfunded debts:			
Armenia	11,959,917.49	13,030,178.36	24,999,095.85
Russia	192,601,297.37	216,957,681.08	400,558,978.45
Total	$ 204,561,214.86	$ 230,996,859. 4	$ 434,558,074.30
Total of above	$11,435,562,685.75	$2,289,886,605.79	$13,725,449,291.54
Germany[2]			
Army costs (reichsmarks)	997,500,000.00	31,431,405.40	1,028,931,405.40
Awards of Mixed Claims Commission (reichsmarks)	2,040,000,000.00	91,290,000.00	2,131,290,000.00
Total (reichsmarks)	3,037,500,000.00	122,721,405.40	3,160,221,405.40
Total (in dollars at 40.33 cents to the reichsmark)	$ 1,225,023,750.00	$ 49,493,542.80	$ 1,274,517,292.80

[1] The German government had been notified that the government of the United States would look to the German government for the discharge of this indebtedness of the government of Austria to the government of the United States.

[2] Indebtedness to the United States under agreements of June 23, 1930 and May 26, 1932.

(D.W.B.)

War Department, U.S.: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

War Labor Board, National: *see* DEFENSE MEDIATION BOARD, NATIONAL.

War Production Board: *see* SUPPLY PRIORITIES AND ALLOCATIONS BOARD; PRODUCTION MANAGEMENT, OFFICE OF: *The War Production Board.*

War Propaganda: *see* PROPAGANDA.

War Relief Contributions. Private organizations in the United States engaged in soliciting contributions for war relief in other countries in 1941 were divided into two categories: (1) Those having as their purpose the supply of relief to countries which had been designated "belligerents" in presidential proclamations issued pursuant to the neutrality act and hence subject to supervision and control by the department of state; and (2) organizations having as their purpose relief activities in "nonbelligerent countries," for example, China and Japan (prior to Dec. 7–8, 1941), the soviet union and Finland, subject to no supervision by any agency of the federal government. The need for some supervision over activities of organizations in the second category was definitely recognized in 1941, prior even to the opening of hostilities in the Pacific.

The American National Red Cross (*see* RED CROSS) is specifically exempted from the requirement of registration with the department of state because it is required, by the terms of its charter, to submit to the secretary of war "a full, complete and itemized report of receipts and expenditures of whatever kind."

Hence unnecessary duplication would result if the Red Cross were required to submit additional reports to the department of state.

In March 1941, at the suggestion of the secretary of state, the president set up the President's Committee on War Relief Agencies to conduct a survey of relief activities, both foreign and domestic, with a view to making suggestions regarding co-ordination of such activities.

The committee released on Oct. 4, 1941, an interim report of its findings. In foreign relief, the committee recommended additional supervision by the department of state to minimize conflict in the timing of various drives.

Circumstances in 1941 prevented extensive relief activities in the countries occupied by the axis forces. It is contrary to the German policy to permit relief agencies other than their own to operate in territory controlled by them, and in each instance where a country was conquered, U.S. and other relief agencies were requested to leave.

No satisfactory supervision over distribution could, therefore, be maintained. In addition, the U.S. government in 1940–41 pursued a policy that paralleled that of Great Britain regarding relaxation of the British blockade to permit passage of food to the conquered countries. Consequently, most relief efforts were directed toward Great Britain. The grand total of funds received by the 326 agencies registered with the department of state (plus several agencies whose licences were revoked) for this period was $48,399,563.44. Of this amount, $37,093,682.22 had been disbursed for relief in various countries. Unexpended balances on Dec. 31, 1941, amounted to $5,546,498.02. The estimated value of contributions in kind sent to the various countries was $14,201,362.31; value of such contributions on hand, $536,241.61. Funds spent for administration, publicity, etc., were $5,761,158.89. Six agencies had received more than $1,000,000 apiece by Dec. 31, 1941, as follows: British War Relief society, $12,285,081.25; Greek War Relief association, $5,373,245.25; American Jewish Joint Distribution committee, $5,117,458.96; Bundles for Britain, $2,809,102; British American Ambulance corps, $1,950,849; and Hadassah, Inc., $1,695,162. (*See* also RELIEF.) (E. D. K.; X.)

Washington. A state in the extreme northwest United States, popularly known as the "Evergreen state," admitted to the union Nov. 11, 1889. Area, 68,192 sq.mi.; pop. (1940) 1,736,191. Capital, Olympia (13,254). The three largest cities are Seattle (368,302); Spokane (122,001); and Tacoma (109,408). The urban population in 1940 was 921,969 or 53·1%.

History.—Although the governor was a Republican and the legislature was preponderantly Democratic in 1941, the 27th session of the latter was remarkably free from partisanship. To meet the substantially increased old-age pensions voted in Nov. 1940, the sales and use taxes were increased from 2% to 3%, and a gift tax was enacted. Defense legislation gave the governor authority to designate defense areas, authorized the transfer of state property to the United States, protected the interests of residents who entered the military or naval services, and made provision for housing those engaged in defense activity. Other reactions to the crisis were an amendment to the criminal anarchy law of 1909 and the requirement that U.S. and Washington history and government be taught in the schools.

The chief state officers in 1941 were as follows: Arthur B. Langlie, governor; Victor A. Meyers, lieutenant governor; Mrs. Belle Reeves, secretary of state; Cliff Yelle, state auditor; Otto A. Case, state treasurer; Smith Troy, attorney-general.

Education.—During the school year 1939–40, average daily attendance in elementary and secondary schools was 274,565; the number of teachers was 10,583. Total instructional cost was $29,442,858.32, and the cost per pupil in daily attendance was $107.23. Salaries of teachers, exclusive of superintendents, averaged $1,641.17. The University of Washington at Seattle and the State College of Washington at Pullman had enrolments of 12,130 and 4,577, respectively, in 1940–41. The three state colleges of education, at Bellingham, Ellensburg and Cheney, had a total enrolment of 3,410.

Public Welfare, Charities, Correction.—The total amount spent upon public assistance in the state, including federal direct expenditures and state-aid, was $47,815,000 for the year Aug. 1940 to July 1941. An average number of 13,049 cases on relief received subsidies totalling $2,418,000. The average number of persons on WPA was 21,103, and the total expenditure was $16,900,000. Old persons averaging 46,174 in number received a total of $15,196,000. An average of 12,014 dependent children received a total of $2,004,000. An average number of 1,044 blind people received aid totalling $398,000. During the period from Sept. 1940 through Aug. 1941, unemployment claims averaging 45,690 per month required an outlay of $6,592,265. In 1940 there were 11 state charitable institutions with a total of 9,068 patients, and four correctional institutions with 2,442 inmates.

Communication.—On Dec. 31, 1938 there were 6,341 mi. of highways in the state. During 1939, $24,289,000 was spent on highways. Railroad mileage was 5,281 mi. and water-borne commerce amounted to 1,845,189 tons in 1938.

Banking and Finance.—State revenue receipts for the fiscal year 1941 were $137,742,561.45; expenditures, $130,737,591. Bonds outstanding to the amount of $10,461,000 represented the indebtedness in 1941. One hundred and thirty-nine banks in the state reported total capital of $30,433,000; capital surpluses and undivided profits of $54,633,000; deposits of $745,962,000 and resources of $812,910,000. On June 30, 1940, there were 31 savings and loan associations with total resources of $25,179,175.

Agriculture.—The total value of 66 farm crops increased from $88,468,000 in 1939 to $95,416,000 in 1940. Acreage harvested in 1940 was 3,547,800 ac. Income from crops in 1940 was $83,444,000; from livestock, $61,898,000; from government payments, $6,443,000.

Leading Agricultural Products of Washington, 1941 and 1940

Crop	1941 (est.)	1940
Wheat, bu.	59,360,000	41,808,000
Apples, bu.	28,350,000	27,469,000
Hay (wild and tame), tons	2,107,000	1,900,000
Potatoes, bu.	8,170,000	8,325,000
Oats, bu.	9,900,000	8,658,000
Pears, bu.	6,099,000	6,100,000

Manufacturing.—In 1937 the total value of manufactured products was $675,640,000; 114,268 salaried persons and wage earners earned a total of $155,061,000. Lumber and saw-mill products, paper and pulp were the chief industries. The defense program dominated the economy of the Puget sound area completely during 1940 and 1941.

Mineral Production.—Production of minerals, valued at $31,590,023 in 1941, reached a postdepression high. Copper was profitable in 1941 largely because of the use of the flotation process at the Howe Sound company in Chelan county. The construction of a new plant to apply this process to magnesite for production of magnesium was completed at Chewelah.

(H. J. De.)

Washington, District of Columbia, national capital of the U.S.A., and 11th largest of U.S. cities, with a population of 663,091 by federal census of 1940. Washington continued to grow after the census of 1940, both within the District of Columbia and in the near-by Maryland and Virginia districts; the growth was due in part to the influx of population in connection with defense activities. In March 1940, about the time of the census-taking, there were 65,437 federal employees. On Dec. 31, 1941 more than 200,000 federal employees were reported, with a probable peak of at least 250,000. The peak of World War I federal employees, on Nov. 11, 1918, was 117,760.

During 1941 a number of monumental public buildings was completed, notably the National Gallery of Art, designed by John Russell Pope, to house the Mellon and other collections of art. The Municipal Center building was erected according to plan for the District of Columbia but was temporarily assigned to federal defense activities. The armory, long projected, was built in 1941 at the end of East Capitol street, overlooking the Anacostia river. A new naval medical centre was erected near Bethesda, Md. The Thomas Jefferson memorial, located on a compromise site on the south axis of the White House, projecting into the Tidal basin, was completed during the year. A first unit for the war department was erected in the northwest triangle, according to the plan of the National Capital Park and Planning commission. Not conforming to the plan, a huge war department building was located in Arlington county, on the understanding that it could be used after the emergency for minor offices, files and storage records. During the year the public buildings plan for Washington was made public by the National Capital Park and Planning commission. Under this comprehensive plan, the principal public buildings were to be located on a four-mile-long belt on the axis of the historic Mall, stretching from the Potomac to the Anacostia river. The congestion in the sector immediately south of the downtown district would be lessened, and the street-and-avenue system would provide a wide choice of routes for traffic to and from government buildings.

In 1941, 23,524 homes and about 1,000 dormitory units were erected or were in course of erection at the end of the year, in the District of Columbia. The new housing program was to provide 22,000 dwellings to be erected by private enterprise and public funds, and 1,500 new dormitory units. In many locations temporary war buildings were erected, but an effort was made to keep the public parks free from unnecessary encroachments.

In 1941 three stream valley parks were completed. Along the Anacostia the additions included the site for the national stadium and lands near the Shaw Lily gardens acquired by the government. The last important gap in the 23½-mi. Fort drive was acquired. Six outlying recreation centres and playgrounds were purchased. Within the congested city, the National Capital Park and Planning commission, which is charged with the duty of purchasing and developing all parks and playgrounds, completed four play areas. Recreational facilities were developed in 18 areas previously acquired by the commission.

During 1941, Washington, planned and developed as the seat of the federal government of the United States, became an increasingly important world capital, and added substantially to the public and private buildings needed to care for its rapidly growing permanent and transient population. (H. Js.)

Water-Borne Commerce of the United States.

Since 1866 the corps of engineers, U.S. army, has been charged with the duty of collecting and compiling statistics showing the water-borne commerce of the United States. Table I shows the commerce at Atlantic, Gulf, Pacific and Great Lakes ports and on the rivers, canals and connecting channels of the United States for each year

Table I.—*Comparative Statement of the Water-borne Commerce of the United States, Eliminating All Known Duplications, by Calendar Years*
(Thousands of tons of 2,000 pounds)

Year	Grand adjusted total*	Ports													Rivers, canals and connecting channels		
		Total, ports	Atlantic, Gulf and Pacific coasts				Great Lakes										
			Foreign		Domestic		Foreign				Domestic						
							Imports		Exports				Receipts and shipments				
			Imports	Exports	Coastwise	Other domestic	From Canada	Overseas via St. Lawrence river	To Canada	Overseas via St. Lawrence river	Lakewise	Internal and local†	Via New York State Barge canal: Coastwise	Via New York State Barge canal: Internal	Via Illinois waterway	Total	Bulk	Package
1920	399,000	326,080	36,581	63,803	47,262	67,295	3,323	‡	9,065	‡	98,370	381	§	§	§	125,100	115,000	10,400
1921	332,000	266,944	31,030	48,521	45,245	70,089	3,991	‡	8,518	‡	58,611	336	§	§	§	110,300	100,900	9,400
1922	376,000	309,344	43,354	43,521	63,501	64,030	5,711	‡	7,204	‡	80,038	395	§	§	§	111,800	100,600	11,200
1923	478,000	389,175	38,682	44,316	88,090	91,970	5,705	‡	8,955	‡	110,349	508	§	§	§	153,700	143,500	10,200
1924	453,700	392,890	36,425	49,008	88,554	109,071	4,962	‡	11,167	‡	93,193	510	§	§	§	173,200	159,200	14,000
1925	483,400	432,109	42,703	49,251	105,090	104,827	7,317	‡	9,187	‡	111,568	2,076	§	§	§	204,000	189,400	15,200
1926	540,500	479,479	44,834	60,859	108,023	119,369	6,424	‡	10,176	‡	116,486	4,308	§	§	§	217,000	200,200	16,800
1927	532,500	471,830	43,388	56,550	121,030	110,495	8,098	‡	12,487	‡	113,017	5,859	§	§	§	219,000	206,400	12,600
1928	530,200	480,020	46,090	56,151	120,075	107,397	8,548	‡	15,379	‡	119,301	6,479	§	§	§	227,300	214,000	13,300
1929	583,800	519,870	51,591	55,701	124,909	126,175	6,385	‡	13,773	‡	135,838	5,348	§	§	§	245,000	230,000	15,000
1930	520,280	458,726	46,448	48,148	117,821	111,068	7,590	‡	11,924	‡	109,791	5,936	§	§	§	226,700	215,300	11,400
1931	445,648	380,120	37,375	38,841	113,049	99,136	3,983	33	9,289	5	71,788	5,721	§	§	§	179,700	166,200	13,500
1932	342,489	280,494	29,843	30,039	94,434	77,265	2,859	213	7,430	45	39,544	4,822	§	§	§	151,300	135,000	15,400
1933	304,104	330,291	27,070	31,108	110,346	70,749	2,749	285	7,486	70	68,583	4,488	658	‖	§	182,900	165,000	17,000
1934	414,308	358,820	30,553	33,570	113,240	90,380	4,016	271	9,117	72	71,575	5,513	219	‖	§	194,800	178,300	16,500
1935	453,331	393,131	33,942	33,022	115,442	106,695	4,393	323	9,038	21	83,508	5,608	239	‖	§	225,900	205,800	20,100
1936	525,842	470,400	37,507	37,154	132,367	125,058	5,090	333	10,005	98	115,102	7,390	296	‖	§	270,300	255,500	20,800
1937	583,100	545,581	43,764	52,909	149,417	138,397	3,772	330	13,580	57	134,751	7,957	647	‖	§	313,300	289,500	23,800
1938	466,900	448,824	33,886	55,476	138,478	122,683	4,925	185	10,642	69	72,778	6,567	135	‖	§	277,800	254,000	23,800
1939	569,400	526,684	37,854	57,711	150,890	138,744	4,736	205	12,049	112	113,309	4,912	185¶	2,213	3,856	329,400	303,600	25,800
1940	607,900	577,233	40,740	49,568	156,831	155,547	4,102	15	10,822	7	141,103	5,276	196	2,550	4,476	306,800	342,000	23,000

*Less than cross addition for reason that the ports and rivers are each credited with their respective total net tonnage, some of which is applicable to both ports and rivers. This duplication is eliminated in the grand adjusted total.
†Tonnages for 1920 to 1932, inclusive, include New York State Barge canal and Illinois waterway traffic entering or departing from Great Lakes; for 1933 to 1938, inclusive, exclude New York Barge canal tonnages, and in 1939 exclude both New York Barge canal and Illinois waterway traffic.
‡Unknown tonnages are included in imports from, and exports to, Canada.
§Shown in column "Internal and local."
‖New York State Barge canal coastwise and internal traffic combined, not separated.
¶One-half of amount included in "Total ports."

from 1920 through 1940 with the totals for each year, adjusted to eliminate all unknown duplications between ports, between waterways, and between waterways and ports. (*See* also CANALS AND INLAND WATERWAYS.) (J. L. S.)

Table II.—*Tonnage of 12 U.S. Ports in 1940*

Port	Tonnage (short tons)	Port	Tonnage (short tons)
New York, N.Y.	129,712,186	Norfolk, Va.	22,625,352
Duluth-Superior, Minn. and Wisconsin	54,147,695	Buffalo, N.Y.	22,527,794
Philadelphia, Pa.	30,788,760	Chicago, Ill.	19,894,064
Toledo, Ohio	28,401,896	New Orleans, La.	19,745,599
Houston, Tex.	27,385,598	Beaumont, Tex.	19,387,986
Baltimore, Md.	26,905,898	Boston, Mass.	19,018,305

Water Power.

Increase of installed capacity of water wheels in the world reported in 1941 was: 2,313,500 h.p. The total reported capacity as of Jan. 1, 1942, was nearly 72,000,000 h.p. on the basis of the report of the United States Geological survey. These capacities which are known to be incomplete, especially from the countries of Europe and Asia, were reported at that time in totals by countries and not in detail by plants because of the world-wide war conditions, the relation of the supply of mechanical and electric energy to the production of military necessities, and the consequent danger of aerial attacks. The increase included 602,800 h.p. completed in 1940. The 1940 increases are distributed by countries in horsepower of plants as shown in the following table:

Brazil	910	Manchoukuo	294,800
Ceylon	670	Norway	33,320
India	18,100	Sweden	121,000
Japan	134,000		

The increase in horsepower capacity of plants completed, 1,710,727 h.p., and the capacity of plants under construction in 1941 is shown by countries in Table I.

In the utilization of water power, the United States, with about 19,800,000 h.p. in installed water wheels, continued to lead the nations of the world in the generation of energy from falling water; and the North American continent, with nearly 30,000,000 h.p. in water wheels, was surpassed only slightly by the European continent. The United States had about 27% in 1941, North America had about 42%, and North America and Europe combined had about 84% of the installed water wheels of the world.

Those two continents, each with about 11% of the world's water-power resources, had, therefore, the major part of the world's installed water wheels in 1941.

The other large continents, Asia, Africa and South America, lag far behind in utilization, although the water-power resources of each equalled or exceeded those of Europe or North America. Japan, including Chosen (Korea) and Manchoukuo, was the only country outside of those continents that had comparable water-power developments, and it had 10% of the world's water-wheel capacity. Asia with 22% of the world's water-power resources had, including Japan's 10%, only about 11% of the installed water wheels; Africa, with 41% of the resources, had only a third of 1% of the water wheels; and South America, with 11% of the resources, had 2·4% of the water wheels.

Table I.—*World Statistics Showing the Increase of Horsepower Capacity of Plants in 1940*

Country	Completed	Under Construction
Alaska	77	600
Argentina	..	19,900
Brazil	13,000	27,527
Canada	260,600	650,000
Chile	..	207,500
Colombia	..	6,330
Costa Rica	..	6,670
Eire	..	45,000
England	..	18,750
Mexico	..	46,700
Newfoundland	..	6,600
New Zealand	394,500	311,400
Panama	..	150
Peru	200	121
Philippine Islands	37,500	..
Portugal	3,850	24,000
Spain	5,000	62,000
Switzerland	48,000	348,000
United States	948,000	6,785,000

The industrial capacity of North America is not dependent primarily on water power, however, and statistics on water-power utilization indicate only a small part of the industrial development on that continent. Such development rests more largely, in the ratio of about 20 to 1, on power derived from the fuels, coal, oil and gas, of which it has great resources of excellent quality. Although the water-power installations in North America are essentially equal to those of Europe, the fuel resources of the former far exceed those of the latter continent. The elimination of all developed water power in North America would remove only about 5% of its developed power, but similar elimination in Europe would have a far greater relative effect on the industrial situation of that continent which must transport overseas a large part of its fuels. (*See* also DAMS; ELECTRICAL INDUSTRIES; TENNESSEE VALLEY AUTHORITY.) (N. C. G.)

Watson, John Christian (1867–1941), Australian politician, born April 9 at Valparaiso, Chile, was the first Labour party member to sit in the commonwealth parliament and the party's first prime minister (1904). He died in Melbourne, Nov. 18. (See *Encyclopædia Britannica.*)

Wavell, Sir Archibald Percival (1883–), British soldier, born in May, was the son of Maj. Gen. A. G. Wavell. Following his father's career, he enlisted in the Black Watch in 1901 after studying at the royal military college and the staff college and saw action in the Boer war, in India and in World War I. He then served with the Egyptian expeditionary force until 1920. In 1938 he was promoted to lieutenant general. From 1937 to 1938 he commanded the British troops in Palestine and Trans-Jordan, and in 1940 he became commander in chief of the British forces in the middle east. In this command he became, late in 1940 and early in 1941, the most famous British general of World War II and, in fact, the only successful allied general of the war to that time. His small force of empire soldiers swept the Italians out of Cyrenaica in Libya, and he supervised the operations in East Africa which recaptured British Somaliland and took Italian Somaliland, Eritrea and Ethiopia from the Italians. Wavell also directed the successful campaigns in Iraq and (in part) in Syria. He suffered serious reverses at the hands of the Germans, however, in Libya, Greece and Crete, and on July 1, 1941, he was succeeded as middle east commander by Gen. Sir Claude Auchinleck (*q.v.*), whose post as commander of the British forces in India Wavell thereupon took over. In August, Wavell directed the British campaign which resulted in the joint British-Russian occupation of Iran. On Nov. 2, 1941, as tension mounted in the far east, he arrived at Singapore for staff talks. After the Japanese declaration of war Dec. 7, Wavell met at Chungking with U.S. Gen. George H. Brett and Chiang Kai-shek (*qq.v.*) to discuss measures for common prosecution of the war against Japan. On Jan. 3, 1942, Wavell was named supreme commander of the allied forces in the far east, with Gen. Brett as his deputy.

Wealth and Income, U. S. Distribution of,

One method of analyzing flow of income is that of its size distribution; *i.e.*, a study of the number of individuals or consumer units receiving incomes of different amounts. Historically, interest in this subject grew out of the social and economic reform movement, with its emphasis on the abolition of poverty. Information on the size distribution of income has many other uses, however, both for government and business economic policy. Such data are used extensively by the marketing research organizations of business in planning sales campaigns, determining advertising media and even production schedules, since the character of the market for any particular product is in part determined by the number of persons with income sufficient to purchase the product. The distribution of income is an important category of information for determining possible yields of various sorts of taxes and tax rates, and the need for such social legislation as Social Security. Inasmuch as the bulk of society's savings is made by the higher income groups, data on the size distribution of income are basic for examination of under-investment theories of the business cycle which have come to the fore in recent years.

Despite the wide interest in this subject, very few attempts have been made to provide quantitative information on the size distribution of income because of the difficulty of the task and the lack of basic data.

A study for the year 1918 in the United States was made by the National Bureau of Economic Research and one for 1929 was provided by the Brookings institution in its report on *America's Capacity to Consume.* The most extensive and most recent study is that issued by the National Resources committee. It provides a wide variety of data on both the distribution of income and the disposition of income for the year 1935–36. Three reports have been published: *Consumer Incomes in the United States, Consumer Expenditures in the United States* and *Family Expenditures in the United States.* These studies were developed from income data for some 300,000 consumer units (augmented by income tax data for the higher incomes) and expenditures data for about 60,000 units. Some of the basic information in these reports is presented in Tables I and III.

The relatively high degree of concentration of income is evident from the data in Table I. It may be calculated that the average income per consumer unit for the year 1935–36, that obtained by dividing the aggregate income by the total number of consumer units, was $1,502. Yet half of the consumer units had incomes below $1,070 because of the large incomes received by a relatively small number of consumer units at the upper end of the income scale. The largest number of consumer units was in the group receiving incomes from $500 to $1,000. This group contained almost 30% of all consumer units and received a little less than 15% of aggregate income. Slightly more than 17% of the consumer units received income of less than $500 and, as a group, received less than 3½% of aggregate income. At the upper end of the income scale it may be noted that the number of individuals included in the various groups fell off sharply after the $3,000 level was reached. Altogether, less than 7% of the consumer units had incomes of over $3,000. This group received over 30% of total income.

The disparity of incomes is strikingly revealed by grouping the total number of consumer units by tenths. The poorest tenth of the consumer units received incomes up to $340 and in the aggregate accounted for less than 2% of total income. The second tenth had incomes ranging from $340 to $545 and received 3% of the total. On the other hand, the tenth of consumer units with the highest incomes included those receiving $2,600 and over and in the aggregate accounted for 36% of the total income. This highest tenth received about the same total income as the 70% at the bottom of the income scale.

As much public discussion has been concerned with the lower third of the population, it is interesting to compare the size distribution of income on the basis of the three thirds of consumer units. Each of these thirds contains 13,000,000 families and single individuals. During 1935–36 the

Table I.—*Size-Distribution and Utilization of Consumer Incomes in the U.S., 1935–36*

(In millions)

Income Level (Dollars per Year)	Consumer Units		Aggregate Income		Income Utilization		
	Number (Millions)	% of Total	(Million Dollars)	% of Total	Current Consumption	Gifts and Personal Taxes*	Savings
Total	39.46	100.00	$59,259	100.00	$50,214	$3,067	$5,978
Under $ 500	6.71	17.01	2,061	3.48	2,817	44	−800
500— 1,000	11.65	29.52	8,745	14.76	9,007	284	−636
1,000— 1,500	8.73	22.12	10,698	18.05	10,204	496	−2
1,500— 2,000	5.19	13.15	8,875	14.98	8,072	362	441
2,000— 3,000	4.44	11.25	10,577	17.85	9,043	465	1,069
3,000— 4,000	1.35	3.42	4,599	7.76	3,631	226	742
4,000— 5,000	.46	1.17	2,045	3.45	1,404	117	434
5,000—10,000	.60	1.52	4,092	6.90	2,604	270	1,218
10,000—20,000	.22	0.56	2,922	4.93	1,532	238	1,152
20,000 and up	.11	0.28	4,645	7.84	1,630	655	2,360

Source: *Consumer Incomes in the U.S.* and *Consumer Expenditures in the U.S.*, National Resources Committee.

*Personal income taxes, poll taxes and certain personal property taxes.

lower third of the nation received incomes of less than $780, with an average income for the group of $471. The share of the aggregate income received by this lower third of the nation was just over 10% of the total of $59,000,000,000. It should not be thought that these 13,000,000 families and single individuals constitute a distinct and unusual group. All types of consumer units, from single individuals to large families, are included in the group; they live in all types of communities; and they work in all the major types of occupations. Apart from receiving less incomes, they differ from the other two thirds of the nation principally in that a larger proportion received relief for some part of the year; a larger number lived on farms; and a smaller number had occupations in the professional, business and clerical fields. Although the proportion receiving relief in this group for some part of the year was relatively large, it was not essentially a group dependent upon relief since 70% of the total number were completely nonrelief families and individuals.

In the middle third of the nation were the 13,000,000 consumer units receiving from $780 to $1,450 during the year. They had an average income of $1,076. As contrasted with the lower third, only 13% were at all dependent upon relief; twice as many lived in large cities; and twice as many worked at professional, business and clerical occupations.

The upper third of the consumer units contained all those with incomes above $1,450, reaching, of course, to over $1,000,000. In total, this group received about two-thirds of the aggregate income of all consumer units.

In interpreting the above data on the distribution of income, it should be kept in mind that the figures refer to dollar income. As the cost of living and the mode of living differ widely from community to community, the dollar incomes do not accurately measure the differences in real income or economic well-being. An obvious illustration of this is the fact that any given income, say $1,000, will provide a higher standard of living in rural communities than in urban centres. On the other hand, the average rural family is larger than the average urban family, and this means a smaller amount of per capita income. It is concluded in the report on *Consumer Incomes in the United States* that the advantages in living costs accruing to farm families are probably insufficient to fully offset differences between their incomes and those of other groups.

With the data and studies available at this time, it is not feasible to compare changes in the entire income distribution over time. However, a study prepared for the Temporary National Economic committee, *Concentration and Composition of Individual Incomes, 1918–37*, provides information on the changing proportion of total income received by those in the highest brackets.

This information is derived from income tax returns.

It would appear from this data, shown in Table II, that the concentration of income in the higher brackets increases with the cyclical expansion of total income and decreases in the downward phase of the business cycle. This tendency is due largely to the fact that the incomes in the higher brackets reflect changes in business profits, which fluctuate more violently with changes in business activity than other forms of income. Over the period covered by this study, there is little evidence of a drastic change in the degree of concentration at the highest income levels.

Disposition of Income.—It may be seen in Table I that more than two-thirds of the nation's consumer units spent considerably more than their aggregate income in 1935–36 for all purposes. In other words, as a group they had negative savings. The proportion of savings to aggregate income became relatively large with those receiving above $5,000 during the year and in the income group above $20,000 approximately half of the aggregate income was saved.

Table II.—*Shares of Total Income Received by Selected Proportions of Income Recipients in the U.S., 1926–37

(Aggregate Income in Millions)

Year	Aggregate Income	Percent of Aggregate Income Received by		
		Highest 2%	Highest ½ of 1%	Highest 1/100 of 1%
1926	$74,484	20.52	12.60	2.70
1927	74,654	21.54	13.51	3.02
1928	79,224	23.65	15.56	3.94
1929	81,050	22.84	14.89	4.00
1930	68,409	18.99	11.22	2.38
1931	54,288	18.51	10.19	1.88
1934	49,400	16.95	9.57	1.76
1934	50,028	17.41	9.86	1.75
1935	54,561	17.81	10.19	1.81
1936	63,943	18.83	10.17	1.97
1937	69,387	17.37	10.14	1.77

Source: *Concentration and Composition of Individual Incomes, 1918-1937*, Temporary Economic Committee.

*Income defined as total income less business expenses. Second figure for 1934 and data for 1935–37 slightly overstated relative to earlier years due to change in income concept.

The average expenditures of each third of the nation for various categories of consumption are shown in Table III. These data reveal the very high proportion of income expended on the necessities of life by the lower third of the nation, as well as the low dollar expenditure totals of this group.

Almost 75% of its income goes for food and housing, and the addition of household operation and clothing brings this to more than 95%. On the other hand, the upper third of the nation spent only a little more than half of its income for these purposes.

The data in Table III give some indication of the vast market for consumer goods which remains to be tapped, even though the standard of living in the United States is the highest in the world.

For example, it may be calculated that in the lower third of the nation the per capita expenditure on food was about $82 for the year, or $1.60 per week. The middle and upper thirds average $125 and $186 per capita or an expenditure of $2.40 and $3.60 per week, respectively.

Table III.—*Average Disbursements of Consumer Units* in Each Third of Nation, 1935–36*

Category of Disbursement	Average disbursements of families and single individuals in:			Percentage of Income		
	Lower third, incomes under $780	Middle third, incomes of $780 to $1,450	Upper third, incomes of $1,450 and over	Lower third	Middle third	Upper third
Current consumption:						
Food	$236	$404	$642	50.2	37.5	21.7
Housing	115	199	408	24.4	18.5	13.8
Household operation	54	108	240	11.4	10.0	8.1
Clothing	47	102	251	10.0	9.5	8.5
Automobile	16	57	215	3.3	5.3	7.2
Medical care	20	41	106	4.3	3.9	3.6
Recreation	9	28	89	1.8	2.6	3.0
Furnishings	9	28	72	1.8	2.6	2.4
Personal care	12	22	44	2.5	2.1	1.5
Tobacco	10	23	40	2.2	2.1	1.4
Transportation other than auto	11	19	37	2.4	1.7	1.3
Reading	6	12	23	1.3	1.2	.8
Education	2	7	30	.5	.6	1.0
Other items	3	6	15	.6	.5	.5
All consumption items	550	1,056	2,212	116.7	98.1	74.8
Gifts and personal taxes†	13	39	181	2.8	3.7	6.1
Savings	-92	-19	566	-19.5	-1.8	19.1
All items	471	1,076	2,959	100.0	100.0	100.0

Source: *Consumer Expenditures in the United States*, National Resources Committee 1939.

*Includes all families and single individuals, but excludes residents in institutional groups.

†Taxes shown here include only personal income taxes, poll taxes and certain personal property taxes.

State Distribution of Income Payments.—Additional information on the geographic distribution of income in the United States is provided by the department of commerce annual estimates of income payments to individuals in the various states. It may be seen from Table IV that the variations in both total and per capita income are substantial. These data relate to dollar income and consequently do not take account of geographic differences in the cost of living. The variations, however, are too large to be explained by this factor. The data bring out the lower levels prevailing in predominantly agricultural states, and the comparatively lower per capita income in the south as against the rest of the nation.

The importance of the prevalence of agricultural activity in an area in determining the level of per capita income is strikingly illustrated by the District of Columbia. This area stands highest in the table of per capita income because it is entirely a metropolitan area, without an agricultural industry. It is known that other metropolitan areas would show an even higher per capita income level if adequate data were available, particularly those dominated by manufacturing industries. As previously mentioned of course, the high per capita income figure shown for the District of Columbia does not take account of the high cost of living in that area and the fact that there are many types of expenses required in urban communities which do not materially add to the standard of living.

Table IV.—*Income Payments to Individuals in the Various States, U.S., 1940*

State	Aggregate ($000,000)	Per Capita* ($)	State	Aggregate ($000,000)	Per Capita* ($)
United States	75,512	573	Montana	325	579
Alabama	748	264	Nebraska	585	444
Arizona	240	478	Nevada	106	960
Arkansas	494	253	New Hampshire	275	560
California	5,680	819	New Jersey	3,011	852
Colorado	621	551	New Mexico	190	356
Connecticut	1,477	864	New York	11,543	814
Delaware	224	836	North Carolina	1,136	317
District of Columbia	845	1,022	North Dakota	247	385
Florida	888	465	Ohio	4,453	644
Georgia	1,006	321	Oklahoma	828	354
Idaho	248	470	Oregon	639	586
Illinois	5,462	691	Pennsylvania	6,185	624
Indiana	1,890	551	Rhode Island	521	730
Iowa	1,197	471	South Carolina	534	281
Kansas	753	418	South Dakota	248	384
Kentucky	941	330	Tennessee	949	325
Louisiana	830	350	Texas	2,715	422
Maine	428	504	Utah	268	487
Maryland	1,208	703	Vermont	195	542
Massachusetts	3,271	757	Virginia	1,135	455
Michigan	3,466	656	Washington	1,101	633
Minnesota	1,473	526	West Virginia	764	401
Mississippi	427	195	Wisconsin	1,690	537
Missouri	1,890	499	Wyoming	162	638

Source: U.S. Department of Commerce.

*Before computing per capita incomes, salaries and wages and total income were reduced in the District of Columbia and New York and increased in Maryland, Virginia and New Jersey to account for residents of the latter states employed by establishments located in the District of Columbia and New York.

Distribution of Wealth.—No official estimates of national wealth or of its distribution have been made since the Federal Trade commission issued a report entitled *National Wealth and Income*, giving figures for the year 1926. The estimated value of national wealth there reported was $353,000,000,000. This figure compares with an estimate of $205,000,000,000 for 1912, but the increase over the ten-year period was influenced heavily by price advances, as well as by quantity additions to physical assets.

The Federal Trade commission also reported data on the values of 43,512 decedents' estates during the 1912–23 period. This study showed that 1% of the estates held 59% of the total wealth of all of the estates analyzed and that more than 90% of the assets of all estates was accounted for by about 13% of the estates. The data also tended to demonstrate a declining degree of wealth concentration over the period and a greater concentration in cities than in towns and rural areas. The sample of estates was very small, however, and it is unlikely that decedents' estates are entirely representative of the asset holdings of living persons, so the wealth-distribution significance of these figures is somewhat limited.

In the June 1927 issue of the *Journal of the American Statistical Association*, Dr. Wilford I. King gave estimates of the distribution of wealth among all property owners in the United States in 1921. He found that approximately half of the 41,000,000 property owners in that year (total population 108,000,000) owned assets worth less than $2,500 each, and, in the aggregate, accounted for less than 10% of the total national wealth. The 10% of property owners who held assets worth more than $10,000 possessed more than two-thirds of the total national wealth. The highest 2% of property owners claimed 40% of the total, and the highest 1% owned approximately one-third. (*See* also BUDGETS, NATIONAL; NATIONAL INCOME.)

(M. GT.)

Weather: *see* METEOROLOGY.

Welles, Sumner (1892–), U.S. undersecretary of state, was born Oct. 14 at New York city and was educated at Groton (Mass.) school and at Harvard. He was secretary of the U.S. embassy at Tokyo from 1915 to 1917, was stationed at Buenos Aires during the next two years, and in 1921 became chief of the Latin-American affairs division of the state department in Washington. In 1922 he was U.S. commissioner to the Dominican Republic, and in 1924 he was President Coolidge's personal representative in Honduras, then in the throes of revolution.

Welles was appointed assistant secretary of state April 6, 1933, and except for a short period as ambassador to Cuba in 1933 held this office until his appointment May 21, 1937, as undersecretary of state.

In the spring of 1940 he undertook a "fact-finding mission" to Germany, Italy, France and Great Britain. During 1941 he held innumerable interviews with various European and Asiatic diplomats, with particular attention to the status of unoccupied France in its relationship to Germany. He also initiated moves to settle the clash between Ecuador and Peru in the summer of 1941, and on July 25 sent identical pleas to both countries to cease hostilities. In August Welles was present at the meeting between Churchill and Roosevelt which produced the Atlantic charter.

Welles headed the U.S. delegation to the Pan-American conference which opened at Rio de Janeiro Jan. 15, 1942.

Wellesley College. A women's college in Wellesley, Mass., founded in 1870 by Henry Fowle Durant, Wellesley occupies 400 ac. bordering on Lake Waban. A four-year liberal arts college enrolling approximately 1,500, Wellesley is pre-eminently for candidates for the B.A. degree, but offers also the degrees of master of arts, master of science, master of arts in education and a certificate in hygiene and physical education. In 1941, 201 faculty members offered instruction in 27 departments.

Extracurricular courses to prepare students for defense work were offered in 1941, and the college opened dormitories for six weeks in the summer to provide housing and recreation for 124 British children in co-operation with the national board of the English Speaking union.

Trust funds in 1941 were $10,790,690.68; the value of the plant was $11,064,229.30. (M. H. McA.)

West Africa, British: *see* BRITISH WEST AFRICA.

Western Australia. A state of the Australian commonwealth; area 975,920 sq.mi.; pop. (est. Dec. 31, 1940) 468,311. Chief town: Perth (pop. Dec. 31, 1940—including Fremantle) 228,000. Governor: (vacant); lieutenant governor: Sir James Mitchell.

History.—The state government, under the premiership of J. C. Willcock, remained in office throughout the year.

The state's water-supply position was greatly improved by the completion of the pipe linking the Canning and Mundaring reservoirs, thereby increasing the capacity by 730,000,000 gal. a year. Work was also begun on a new 25,000,000 gal. reservoir 18 mi. west of Coolgardie.

Agricultural conditions were favourable. Efforts were made to establish the growing of linseed for grain. It was expected that the state would become self-supporting in linseed oil production, and linseed cake would be a valuable stock food. In 1941, 8,000 ac. were sown to flax and the area under tobacco was extended. Existing factories worked to full capacity on government orders and a small-arms factory was being erected.

Finance.—Revenue (1940–41), £A11,432,000; expenditure, £A11,421,000; debt outstanding (June 30, 1941), £A97,792,000.

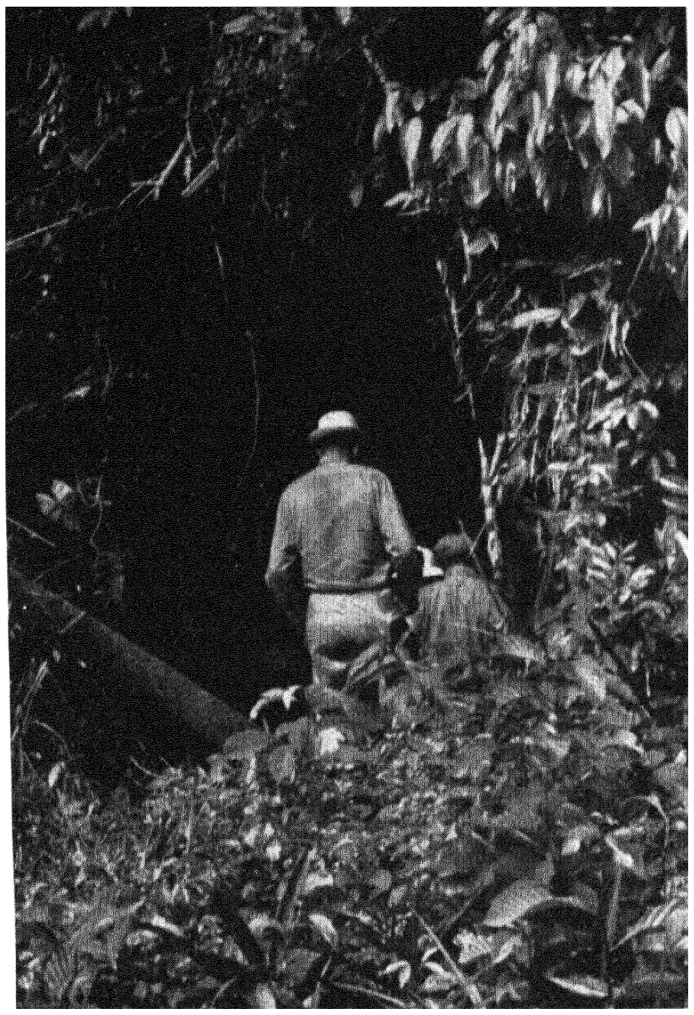
Communication.—Rapid progress was made on the construction of an 800-mi. strategic east-west road between Norseman (W.A.) and Port Pirie in South Australia. The work was authorized in June 1941, and by the end of August the state main roads authority had cleared 195 mi. and completed 105 mi. of the 450-mi. section within the state. It was planned to be completed by the end of 1941.

Roads (June 30, 1939) 29,722 mi. fit for motor traffic; railways (1938–39), government 4,378 mi.; motor vehicles licensed (Dec. 31, 1939): cars 36,058; trucks 22,172; cycles 6,015. Wireless receiving set licences (June 30, 1939) 79,262.

Agriculture and Manufacturing.—Production: wheat (1940–41) 21,600,000 bu.; wool (1940) 81,000,000 lb.; gold (1940) 1,191,481 fine oz. Industry and labour (1939): factories 2,129; employees 23,211; gross value of output £A19,548,511; unemployment (trade union returns) (March 1941) 4.3%. (W. D. MA.)

West Indies. An archipelago lying between Florida and South America, embracing the Greater Antilles (Cuba, Hispaniola, Puerto Rico and Jamaica, with lesser dependent islands) and the Lesser Antilles (extending from the Virgin islands to Trinidad). The area is approximately 99,000 sq.mi. The population (estimated at roughly 12,500,000 at the end of 1941) is three-fourths white and one-fourth Negroid in Cuba and Puerto Rico and 80% to 99% Negroid elsewhere, except in Trinidad, where it is 40% East Indian. Languages: Spanish, English, French and Dutch. Religion: generally Roman Catholic. The West Indies includes three republics, one Netherlands, two French and six British colonies, and two U.S. dependencies.

During 1941, World War II and its effects dominated West Indian history. By the year's end the entire archipelago, with the technical exception of the French colonies, was at war. Normally, trade is mainly with the United States and, in the European colonies, with their respective metropolises. But, under war conditions, difficulty of access to customary markets and sources of supply turned trade toward the United States, especially, and Canada, and caused heavy surpluses to accumulate. By 1941, however, and especially after spread of the war to the Pacific, sugar (the most important product), long under restriction because of world overproduction, came into heavy demand. Piled-up stocks were generally cleared, and 1942 crops were contracted for in advance. Cacao and other tropical agricultural products, including spices, are also grown. These products, with sugar, constitute practically the sole exports, except in Trinidad and Curaçao, and to some extent in Cuba, where mineral exploitation is under way. Petroleum and asphalt are important in Trinidad, and some metals are found in Cuba and Hispaniola. Curaçao is a major world oil-refining centre. External communication is by sea, with Pan American airways linking the main centres with all parts of America. (See CUBA; CURAÇAO; DOMINICAN REPUBLIC; FRENCH COLONIAL EMPIRE: *French Colonies*



DENSE JUNGLES hampered the work of surveyors and engineers building the U.S. army base at Trinidad in 1941

in America; HAITI; HISPANIC AMERICA AND WORLD WAR II; PUERTO RICO; VIRGIN ISLANDS; WEST INDIES, BRITISH.

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West Indies, British.

The several British islands in the West Indies have an area of 8,240 sq.mi. The population is approximately 2,300,000 (see Table I for latest available official estimates). Racially the population ranges from 75% to 99% Negro and Negroid, except in Trinidad, where some 40% is East Indian and 1% Chinese. The chief cities are the capitals (see table). Only Kingston, Port of Spain, and to some extent Bridgetown are important in the West Indies as a whole. Politically, the islands are administered separately or in groups as British crown colonies: Jamaica, with its dependencies; the Leeward islands, a loose federation of the "presidencies," or colonies, of Antigua, Montserrat, St. Kitts-Nevis and Virgin islands (British); Barbados; Trinidad and Tobago; Dominica; Grenada; St. Lucia; and St. Vincent. The four last-named, collectively called the Windward islands, have a common governor, who usually resides at St. George's, Grenada, and with the Leeward colonies form a single judicial system, but are otherwise separate colonies. As an outgrowth of the recommendations of the 1938–39 West India Royal commission (headed by Lord Moyne), the post of comptroller for development and welfare was created in 1940. The comptroller supervises and directs plans for social and economic rehabilitation and development of the island colonies and of British Guiana and British Honduras. At the same time the courts of the Leeward and Windward colonies were placed under a single chief justice. These steps were regarded as tentative moves toward eventual political federation of the West Indian colonies.

Each colony has a governor or other chief executive appointed by the crown (for names of governors, *see* BRITISH EMPIRE), an appointed executive council and a partially elected legislative council or assembly. Barbados has a representative legislature (the third oldest in the British Empire), but not full responsible government and until 1941 was the only West Indian colony electing a majority of its legislative body. In 1941 Jamaica and Trinidad and Tobago were both granted new constitutions providing universal suffrage and a majority-elected lower house (in Jamaica for the first time since 1866), checked, however, by an increased gubernatorial veto power. Suffrage and officeholding are generally restricted by property and other qualifications.

History.—During 1941, as in 1940, the British West Indies were profoundly influenced by World War conditions. The colonies continued to send recruits and to make colonial and private gifts toward the war effort on a large scale, along with interest-free colonial loans for the duration of the war. Thus, the government of Trinidad and Tobago alone made gifts and loans in excess of £1,000,000. Trinidad, too, served as a censorship and trade control station.

In January, difficulties with the United States over locations of new bases in Trinidad were adjusted, and on Mar. 27 a definitive agreement was signed at London replacing the tentative arrangements concluded in Sept. 1940. Specific grants were made of five areas in Jamaica aggregating some 55 sq.mi., including Portland Bight, the Portland Ridge peninsula shoreline, Manatee Bay shoreline and adjacent areas, and Pigeon island; six in St. Lucia, around 1,300 ac., including Gros Islet bay, along with other privileges; two tracts on Antigua, at Parham harbour and on Judge's bay (about 700 ac.); and four air and naval base areas on the west coast of Trinidad, 32 sq.mi. in extent, special anchorage rights in the Gulf of Paria, and wharfage facilities at Port of Spain.

During the course of the year construction of the main facilities at the United States bases was rushed and occupation was effected. Economic effects of the construction work were felt in some instances, notably in Trinidad, with labour shortage, rising wage scales, and stimulated buying power. Labour shortage in Trinidad, the greatest single centre of base development, with an expenditure of over $17,000,000, necessitated relaxing of immigration restrictions to permit entry of Barbadian and other agricultural labour. The local expenditure alone in Jamaica was estimated at in excess of £1,000,000.

Continued attention to problems of the West Indian colonies was noted in the granting of new constitutions to Jamaica and Trinidad. Although the changes did not entirely meet the demands of Jamaica's socialistic "People's National Party," they generally met qualified approval. On the economic side, inter-

Table I.—*Areas and Population of British West Indies*

Colony	Area (sq. mi.)	Pop. (1939 est.)	Capital (with est. pop.)
Barbados	167	195,548	Bridgetown (70,500)
Jamaica and dependencies			
Jamaica	4,573	1,186,017	Kingston (76,986)
Cayman Islands	104	6,850	Georgetown
Turks and Caicos	169	5,522	
Leeward Islands			
Antigua (including Barbuda, 62 sq.mi. and Redonda)	171	35,527	St. John's (10,000)
Montserrat	32	13,541	Plymouth (2,000)
St. Kitts-Nevis (St. Christopher, 68 sq.mi.; Nevis, 50 sq. mi.; Anguilla, 34 sq.mi.)	152	37,579	Basse-Terre (8,000)
Virgin Islands (British)	67	6,288	Road Town (400)
Trinidad and Tobago (Tobago, 116 sq.mi., pop. 29,082)	1,980	473,455	Port of Spain (89,550)
Windward Islands			
Dominica	304	52,738	Roseau (8,000)
Grenada (including Carriacou, 13 sq.mi., pop. 9,358)	133	90,586	St. George's (6,500)
St. Lucia	238	69,787	Castries (9,000)
St. Vincent (including the Lesser Grenadines)	150	59,683	Kingstown
	8,240	2,233,121	

colonial conferences were held to discuss sugar and import control problems. During the year the comptroller of development and welfare announced tentative development plans involving outlays of £20,000 in Montserrat and £39,000 in Antigua over a five-year period. Meanwhile, concerted efforts to extend homesteading and small landholdings were continued. Some consideration, too, was given to the practicability of a special census (none having been taken in Jamaica and some other colonies since 1921) as a guide and aid to social and economic development.

The economic situation was confused. Living costs rose sharply with price levels in Jamaica 37·72% over those of Sept. 1939 and 34·36% in Barbados. British embargo on fresh fruits, including bananas, was partly offset by purchases of surpluses. Toward the end of 1941, especially, increased Empire and other demand for sugar (long under export quota, owing to world overproduction) had cleared practically all the islands' stocks, and export trade was generally in a definitely superior condition to that of 1940.

Education.—In 1940 there were 1,338 elementary schools, with approximately 326,054 pupils, as well as secondary schools. Higher education is provided at Codrington college, near Bridgetown, Barbados, and at the Imperial College of Tropical Agriculture at St. Augustine, Trinidad. The latter, supported by British West Indian and West African colonies and the imperial government, is one of the world's leading institutions of its kind.

Finance.—The monetary unit is the pound sterling, except in Trinidad. The Trinidad dollar, officially valued at $4.80 to the pound sterling, and normally equal to the United States dollar (1941 value: approx. 84 cents) is legal tender in both Trinidad and Grenada.

Trade.—Under war conditions detailed statistics of external trade were not generally available. In 1939 imports and exports were: Trinidad and Tobago, $34,762,954; $37,481,438; Jamaica, £6,506,659 (1940: approx. £6,000,000); £4,764,746 (1940: approx. £3,000,000); Barbados, £2,445,753; £2,028,991; Grenada, £292,829; £310,687; St. Kitts-Nevis £293,264; £433,824; Antigua, £230,874; £220,460; St. Vincent £198,786; £210,642; St. Lucia, £161,823; £117,201; Dominica, £109,594; £65,077; Montserrat, £49,301; £54,540; Virgin Islands, £14,125; £9,898. Trade of the Leeward islands as a whole in 1940 was: imports, £688,905; exports, £760,655.

In general, 1941 witnessed an improved trade stability, owing in part to readjustments after the initial impact of the war on the colonies, and in part to increased demands for colonial products, notably sugar, cotton and Trinidadian petroleum. Consequently, volume and value of external trade generally expanded, especially in the sugar colonies. Until 1939 Great Britain supplied from 20% to 45% of imports and took from 25% to 40% (except in Dominica), Canada 15% to 20%, and up to 50% of Barbados exports; the United States supplied from 12% to 25% of imports except in the smaller colonies and took nominal amounts to as high as 35% (St. Vincent).

The 1941 trend was marked by sharp declines in supplies from Great Britain and corresponding rises in imports from Canada and the United States. Imports from outside of sterling areas were under strong restrictions. In 1940 the United States supplied $18,309,472 of imports (1939: $17,659,829), with $657,856 to Barbados (a 53% decline), $3,544,909 to Jamaica (40% decline), Trinidad, and Tobago, $10,279,152 (48% increase), other colonies $3,827,555 (12% increase). In the first nine months of 1941, the same trends continued, although with somewhat less sharpness.

Exports to the United States in 1940 totalled $3,824,759 (1939: $4,610,107), Barbados $342,385, a 30% rise; Jamaica $1,501,264, a 2% decline; Trinidad and Tobago $1,754,422, a 26.3% advance, other colonies $1,226,688, a 17% decline. In the first nine months of 1941, total exports to the United States almost doubled, Barbados increasing 10%, Jamaica 165%, Trinidad and Tobago 75%, the other colonies 55% over corresponding 1940 figures. Canadian trade in the first six months of 1941 increased 98% over 1940. All Jamaican exports in the first ten months of 1941 totalled £3,369,307 value (1940: £2,622,126), or more than all export values in 1940 (offic. est.: £3,000,000). Imports in the first nine months were £4,400,285 value (1940 offic. est.: £6,000,000). Increased volume and price of sugar and other commodities contributed heavily to the swollen figures.

Communication.—External communication is by steamship and by air, with similar inter-island communication. Pan American Airways serves Jamaica, Antigua, Barbados and Trinidad; the British West Indies Airways links Barbados, Tobago and Trinidad. During 1941 "KLM" (Royal Dutch Air Lines), already connecting Trinidad with Surinam, Venezuela and Colombia, was extended to Jamaica. Inter-island communication is generally poor. Kingston, Bridgetown, and Port of Spain are the chief ports of call. Only Jamaica (210 mi. in 1941) and Trinidad (123 mi.) have extensive railways. The Leeward colonies had 78 mi. in 1941. Roads are adequate for local needs.

Agriculture.—Except in Trinidad, where petroleum (1941 est. 21,100,000 bbl.; 1940: 20,300,000 bbl.) and asphalt dominate economic life, and in Barbados, where some slight petroleum deposits exist, the British West Indies lack mineral resources. Agriculture, along with the processing of its principal products (notably sugar), is almost the sole basis of economy. A wide diversity of agricultural commodities is produced, but sugar, bananas, cacao and cotton are the most important.

Nearly all the islands are heavy producers of sugar, with Barbados, Antigua, St. Kitts-Nevis and the Virgin islands depending primarily on it. In 1941, the eight leading islands produced some 457,965 tons: Jamaica 156,591 (1942 est. 168,830); Trinidad 131,608 (1942 est. 150,000); Barbados 100,373; St. Kitts 37,186; Antigua 17,584 (1942 est. 25,000); St. Lucia 10,166; Nevis 4,357; St. Vincent 100 tons (approx.). The entire 1940 and 1941 export crops were generally purchased by the British government and contracts were made for the 1942 export. A large portion of the sugar output is processed into rum and molasses.

More than 97% of the banana acreage (1940: 76,022 ac.) is in Jamaica, normally the world's leading exporter, nearly 90% to Europe. In 1940 Jamaica exported 7,500,000 stems (1939: 18,771,628; 1938: 23,811,337). Losses through the British embargo of fresh fruits (to conserve shipping space) were modified by a British compensation payment system.

Cacao (1940: 237,014 ac.) leads in Trinidad and Tobago (210,000 ac.) and Grenada (20,500 ac.). Grenada's 1940–41 crop was 39,573 bags (1939–40: 33,653 bags). Trinidadian export declined sharply in 1941, because of drouth. World overproduction necessitated an international export quota.

In 1940–41, 19,030 ac. were planted in sea island cotton, with an estimated production of 3,083,500 lb.: Montserrat, 4,500 ac., 900,000 lb.; Antigua, 3,500 ac., 640,000 lb.; St. Vincent, 5,200 ac., 570,000 lb.; Nevis, 3,500 ac., 500,000 lb.; St. Kitts, 1,500 ac., 400,000 lb.; Barbados, 450 ac., 46,000 lb.; Anguilla, 200 ac., 15,000 lb.; Virgin islands, 140 ac., 7,400 lb.; St. Lucia, 40 ac., 5,100 lb. Grenada (5,000 ac., 30,000 lb. est.) and St. Vincent (450 ac., 54,800 lb.) produce Marie Galante (ordinary strain) cotton.

Citrus fruits, especially oranges, limes and grapefruit, are grown in most of the colonies, with 10,780 ac. in citrus groves (1940) and make up over half of Dominica's exports. Dominica, St. Lucia, Trinidad and Montserrat account for most of the world's lime juice production. Under war conditions most of the 1941 citrus export was processed. Spices are important, especially in Grenada, where nutmeg (1940–41: 33,279 cwt.; 1939–40: 30,004 cwt.), mace (1940–41: 6,329 cwt.; 1939–40: 5,841 cwt.), and other spices comprise over a third of exports; and in Jamaica, the sole source of pimento ("allspice"), and an important producer of ginger. Arrowroot accounts for two-thirds of exports in St. Vincent, the dominant world producer (1940: over 11,000,000 lb.).

British West Indian coffee is generally of a low grade. Jamaica "Blue Mountain" coffee, however, is one of the world's finest.

The Leeward and Windward colonies produce fresh vegetables, notably tomatoes, for export to Canada. In addition a wide variety of vegetables for local consumption was being grown in increasing volume in 1941.

(L. W. Be.)

West Virginia.

A state in the Appalachian mountain region in the eastern part of the United States, sometimes called the "Panhandle state" and sometimes the "Mountain state." West Virginia was formed from Virginia during the Civil War and admitted to the union June 20, 1863. Area, 24,282 sq.mi.; population (1940) 1,901,974, of which 1,742,320 were white (41,782 foreign born). Its total urban population was 534,292. Its capital is Charleston (pop. 67,914). Its other chief cities are Huntington (78,836) and Wheeling (61,099).

History.—The chief state officers in 1941 were: governor, Mansfield M. Neely; secretary of state, William S. O'Brien; treasurer, R. E. Talbott; auditor, Edgar B. Sims; attorney general, Clarence W. Meadows. All except the governor were re-elected in Nov. 1940. For governor, Neely received 496,028 and D. Boone Dawson, 383,698.

Education.—Education is free in the public schools for all children between 6 and 20 years of age and is compulsory for all between 7 and 16. The pupil enrolment (net) in the 4,849 state elementary schools for 1940–41 was 306,942. In the 413 state high schools it was 144,111. The number of teachers was 10,842 in the elementary schools and 5,359 in the high schools. The total state appropriation for elementary and secondary education in 1940–41 was $13,300,000 (the general school fund, $946,918).

The state supports seven teacher-training colleges which in 1940–41 had a total student enrolment of 4,672 and a total instructional membership of 355, and received state appropriations amounting to $1,225,550. It also supports the West Virginia university, which in 1940–41 had an enrolment of 4,369 (including summer), a total faculty membership of 270 and 68 assistants, and a total income of $3,275,885.

Public Welfare, Charities, Correction.—In Jan. 1941, a more extensive program of public assistance and relief was begun. The number of old-age, blind and dependent children assistance cases rose from 18,000 in July 1940, to 29,500 in July 1941. The relief load grew from 12,775 to 14,347. The average grants of aid were also increased. The total expenditure for old-age assistance was $3,206,885; for the blind, $179,180; for dependent children, $2,450,464. Including the cost of administration, the total cost was $6,337,748. The total general relief fund was $3,145,116.

Communication.—In 1941 the state had about 4,175 mi. of steam railway (about 6,920 mi. including all sidings), 130 mi. of electric railway and an extensive system of improved highways (approximately 16,700 mi., of which 4,600 mi. comprised the primary system and 12,100 the secondary system). The total mileage of airlines in the state was 510; there were 15 improved airports and nine partially-improved landing fields. The total number of telephones was 218,820.

Banking and Finance.—On July 1, 1941, the total deposits of the 104 state banks and trust companies were $161,259,278.21. The total deposits of the 77 national banks in the state were $189,778,000. Resources of 22 federal savings and loan associations were $18,768,807.76. Resources of 38 state building and loan associations were $11,837,794.06.

The summarized financial statement of the state treasurer for the fiscal year 1940–41 is shown in Table I.

Table I.—*West Virginia Financial Statement for Fiscal Year 1940–41*

Balance July 1, 1940	(all funds)		$ 16,470,897.80
Receipts for 1940–41	(all funds)		114,333,278.66
	(transfers)		44,815,196.98
Total			$175,619,373.44
Disbursements, 1940–41			
(all funds)		$108,470,005.11	
(transfers)		44,815,196.98	
			153,286,192.09
Balance, July 30, 1941			$ 22,333,181.35

On July 1, 1941, the total state funded indebtedness was $76,085,000; the total amount of outstanding state road bonds was $73,985,000. Total state debt, gross and net, was $70,917,804.

Agriculture.—Total cash income from farm crops and livestock in 1940 was $41,052,000; income from government payments was $1,920,000.

The number of farms by census of 1940 was 99,282 (acreage 8,908,803), valued at $269,827,285.

Manufacturing.—In 1940, the state had 3,188 reporting industrial establishments, which employed 230,726 persons and paid $396,884,878.99 in wages. These plants had a total production of about $898,722,285.80. The chief industries were steel, glass, chemicals, petroleum refining, stone, potteries and porcelain, cement, lumbering, woodworking and flour.

Table II.—*Acreage, Yield and Value of West Virginia Farm Crops, 1940*

	Acreage	Yield	Value
Corn	476,000	12,852,000 bu.	$10,025,000
Wheat	139,000	2,016,000 bu.	1,774,000
Oats	68,000	1,462,000 bu.	702,000
Buckwheat	14,000	245,000 bu.	191,000
Hay (Tame)	726,000	833,000 tons	8,252,000
Apples	..	4,808,000 bu.	3,408,000
Potatoes (Irish)	33,000	3,630,000 bu.	3,049,000
Barley	13,000	306,000 bu.	171,000

Mineral Production.—In 1939 the oil production was 3,587,000 bbl. and the natural gas production was about 150,000,000,000 cu.ft., which increased to 160,000,000,000 in 1940. In 1939 coal production was 108,515,665 short tons, in 1940, 126,619,825 tons. Coke production (bee hive only) increased from 80,310 tons in 1939 to 216,943 in 1940.

BIBLIOGRAPHY.—*West Virginia Bluebook* and various official departmental reports. (J. M. CA.)

Weygand, Maxime (1867–), French soldier. For his biography, see *Encyclopædia Britannica*. On May 19, 1940 Weygand was appointed commander in chief of the Allied armies to succeed Gen. Maurice Gamelin, at the moment when the defeat of France was imminent. Dismissing 15 generals, Weygand planned a "defense in depth" in a vain attempt to halt the German onrush after the invaders had routed the Allied troops from Flanders. When Pétain replaced Reynaud as premier, Weygand was named minister of defense in the cabinet. Here he remained through the armistice negotiations until Sept. 6, when he was "relieved" of his cabinet post and sent to Africa to deal with the defection of various French colonies to Gen. Charles de Gaulle (*q.v.*). His failure to return to Vichy in the succeeding months gave rise to speculation that he himself had decided to aid the Free French, but he vehemently denied the allegation.

During 1941, Weygand remained loyal to Vichy and Marshal Pétain, but at the same time he would not consent to German occupation of Bizerte in Tunisia. He conferred with Pétain at Vichy in March 1941 and again in June, when he was reported to have disagreed violently with Vice-Premier Darlan (*q.v.*) upon the extent to which French-axis collaboration in North Africa should go. Weygand apparently won his point with Pétain, at least temporarily, for he was made French proconsul in Africa shortly thereafter, and governor general of Algeria July 17. Then Vichy opinion reversed itself once more, and on Aug. 5 Weygand was ordered to submit all questions of colonial policy to Darlan. On Nov. 20 he was retired as African proconsul and was succeeded by Alphonse Juin.

The United States, maintaining that Weygand had been removed at the express demands of Hitler, immediately stopped all economic aid to French North Africa.

Wheat. Larger wheat crops were reported generally throughout the world in 1941, in the United States, Europe, Argentina and China. Only Canada, among the large producing countries, reported reduced production. The International Wheat conference meeting in Washington, D.C., July 10–Aug. 3, representing the United States, the United Kingdom, Argentina, Canada and Australia, reported that as of July 31, 1941, export stocks of wheat were sufficient to meet the normal requirements of importing countries for two years. The 1941 United States crop was reported by the department of agriculture in November as 961,194,000 bu., compared with 816,698,000 bu. in 1940; ten-year (1930–39) average was 747,507,000 bu. Excepting the U.S.S.R., for which no figures were available, the 1941 wheat crop in Europe was estimated by Broomhall in October at 1,480,000,000 bu., compared with 1,325,000,000 bu. in 1940 and a five-year (1930–34) average of 1,516,000,000 bu. The first official estimate in Canada placed the 1941 crop at 306,459,000 bu., a reduction of 44·4% from the 551,390,000 bu. of 1940. Canada, the world's largest wheat exporter, adopted a program of drastically reduced acreage in 1941 in an effort to counteract a mounting surplus that had become burdensome. In addition to a bonus to wheat growers, the Canadian government paid transportation charges on wheat and wheat products shipped in carload lots from Fort William, Port Arthur and Armstrong, Ont., to eastern Canada for livestock and poultry feed. The extra subsidy served a double purpose; it helped prairie province farmers reduce the surplus and enabled eastern provinces to increase meat production. The quota of Canadian wheat exports to the United States for the year beginning May 28, 1941 (795,000 bu.) was filled by Sept. 21, 1941.

Although Broomhall and other authorities in the trade gave an over-all estimate for Europe, official estimates from many countries were lacking because of the war. Table I is, therefore, an incomplete list of other wheat-producing countries and their 1941 and 1940 crops.

Table I.—*Wheat Production in Certain Countries, 1941 and 1940*

Country	1941 bu.	1940 bu.
China	720,000,000	700,000,000
Argentina	271,173,000	119,453,000
Italy	262,944,000	261,252,000
Spain	108,944,000	79,412,000
Australia	83,848,000	210,277,000
Japan	53,000,000	66,134,000
Manchoukuo	29,800,000	27,558,000
Union of South Africa	16,163,000	15,310,000
Portugal	14,882,000	9,921,000
Sweden	12,403,000	15,450,000
New Zealand	8,400,000	8,010,000
Finland	6,224,000	6,908,000

The 1941 wheat crop in the United States produced the highest per-acre yield on record, 16·9 bu., compared with 11·1 bu. in 1941

Table II.—*U.S. Wheat Production by States, 1941 and 1940*

State	1941 bu.	1940 bu.	State	1941 bu.	1940 bu.
Kansas	170,849,000	123,848,000	Virginia	7,950,000	8,463,000
North Dakota	146,230,000	97,054,000	Kentucky	7,215,000	5,625,000
Montana	79,402,000	56,070,000	North Carolina	6,594,000	6,132,000
Washington	59,360,000	41,808,000	New York	6,592,000	7,996,000
Oklahoma	50,353,000	56,332,000	Utah	6,227,000	4,861,000
Ohio	49,724,000	42,137,000	Wyoming	5,598,000	3,410,000
Illinois	37,852,000	40,155,000	Tennessee	5,438,000	5,116,000
Indiana	37,344,000	30,147,000	Iowa	3,135,000	8,121,000
Texas	35,420,000	29,355,000	South Carolina	2,900,000	2,688,000
Nebraska	35,394,000	34,821,000	New Mexico	2,243,000	1,720,000
South Dakota	35,024,000	26,221,000	West Virginia	2,030,000	2,016,000
Idaho	28,038,000	24,383,000	Georgia	2,024,000	1,880,000
Oregon	22,507,000	17,184,000	Wisconsin	1,490,000	1,743,000
Colorado	22,180,000	13,560,000	Delaware	1,480,000	1,406,000
Minnesota	21,268,000	32,069,000	New Jersey	1,232,000	1,316,000
Pennsylvania	18,325,000	18,780,000	Nevada	484,000	483,000
Missouri	17,580,000	31,707,000	Arizona	465,000	819,000
Michigan	16,352,000	17,812,000	Arkansas	332,000	352,000
California	11,415,000	11,370,000	Alabama	91,000	75,000
Maryland	7,980,000	7,566,000	Maine	68,000	88,000

and a ten-year average of 9.3 bu. to the acre. The 1941 acreage was 56,783,000 as against 53,503,000 ac. in 1940 and a ten-year average of 55,884,000 ac. The 1941 crop consisted of 684,966,000 bu. of winter wheat and 276,228,000 bu. of spring wheat. In 1940 winter wheat production was 589,151,000 bu., spring wheat 227,547,000 bu. The ten-year average of winter wheat was 569,417,000 bu.; spring wheat, 178,090,000 bu. Of the varieties of spring wheat, that of Durum, the macaroni wheat, produced 44,490,000 bu. in 1941, compared to 34,776,000 bu. in 1940; the ten-year average, 27,598,000 bu. (*See* also CEREALS; FLOUR AND FLOUR MILLING.) (S. O. R.)

Wheeler, Burton Kendall (1882–), U.S. politician, was born Feb. 27 in Hudson, Mass. He was graduated from the University of Michigan law school in 1905, and was admitted to the bar in Montana the following year. In 1911–13 he was a member of the Montana house of representatives. He was U.S. district attorney for Montana, 1913–18. In 1920 he ran unsuccessfully for governor of Montana on the Non-Partisan league ticket. In 1922 he was elected to the U.S. senate and was re-elected three times. Although generally a member of the Democratic party, he ran for vice-president of the United States on the Progressive ticket in 1924. In 1937 he led the fight against the supreme court "packing" bill. He became an active leader of the U.S. noninterventionist group during 1941, devoting much of his time to speaking throughout the country against President Roosevelt's foreign policies. But with the Japanese attack on Pearl Harbor, Senator Wheeler declared on Dec. 7, 1941: "In view of the vicious and uncalled-for attack upon the United States by the Japanese government, congress must declare war upon that government. . . . The only thing now is to do our best to lick hell out of them."

Whisky: *see* LIQUORS, ALCOHOLIC.
Wholesale Trade: *see* BUSINESS REVIEW: *Retail and Wholesale Trade.*

Whorf, Benjamin Lee (1897–1941), U.S. expert on Aztec and Mayan civilizations, was born April 24 in Winthrop, Mass. After graduating from the Massachusetts Institute of Technology in 1918, he joined an insurance company, but spent most of his leisure hours studying Aztec and Mayan cultures. In 1928 he won the attention of the scientific world with his report on a transcription of Aztec records before the International Congress of Americanists in New York city. In 1930 the Social Research Council of New York sent Whorf to central Mexico, where he lived in Indian villages and transcribed Aztec folk songs and legends. Yale university awarded him an honorary fellowship in anthropology in 1936 and the Sterling fellowship in 1937. He died in Wethersfield, Conn., July 26.

Wickard, Claude Raymond (1893–), U.S. secretary of agriculture, was born near Delphi, Ind. on Feb. 28. After his graduation from Purdue university in 1915 he took over management of a farm near his birthplace. In 1933 he was appointed to the staff of the Agricultural Adjustment administration as assistant chief of the corn-hog division. He advanced to chief of the division in 1935 and later became director of the AAA's conservation program for the north central states. On Feb. 1, 1940 he was appointed undersecretary of agriculture, and on Aug. 19, after the resignation of Henry A. Wallace (*q.v.*), President Roosevelt nominated him secretary of agriculture. Wickard declared after his nomination that he intended "to carry out the policies of Henry A. Wallace," his predecessor in the cabinet.

In March 1941 Wickard took charge of the production and distribution of food to Britain and her allies under provision of the lend-lease act. He pressed the "food for freedom" program with vigour and urged U.S. farmers to multiply their output of eggs, milk, tomatoes, beans, pork and other products. Food, he said, would be a prime factor in victory; on Sept. 23 he told a house of representatives committee that the U.S. should send Britain $1,000,000,000 in food before Feb. 1942 to prevent a British defeat.

Wild Life Conservation: *see* FISH AND WILD LIFE SERVICE.

Willcox, Sir William Henry (1870–1941), British expert on poisons, was born on Jan. 18. He received his M.D. degree from London university and was a lecturer on chemical pathology at St. Mary's hospital, 1900–30; he also lectured on forensic medicine at the same institution, 1906–35. He served in World War I as a colonel, and after 1919 he was a medical adviser to the British home office. In 1917 he became a companion of the bath, and he was knighted in 1921. Sir William was a fellow of the Royal Society of Medicine and president of the Medical Society of London, 1936–37. He died in London, July 8.

William II (1859–1941), German emperor, was born Jan. 27 in Berlin. The kaiser fled to the Netherlands on Nov. 10, 1918 and lived in lonely exile at his estate in Doorn after renouncing his throne at the close of World War I. He spent his days chopping wood, and after the death of Empress Augusta Victoria he was married to Princess Hermine of Schönaich-Carolath in 1922. When German troops invaded the Netherlands in May 1940, they detoured around Doorn in deference to their former kaiser, and a guard of honour was placed at the gates of his estate. In his last years William II dictated chapters of a book in which he hoped to disprove the Allied thesis that Germany was solely responsible for World War I. He died at Doorn on June 4 and was buried with military honours. (See *Encyclopædia Britannica.*)

Willingdon, Freeman Freeman-Thomas, MARQUESS OF (1866–1941), British diplomat, was born Sept. 12 in Sussex, England. He entered the diplomatic service in 1895 as an aid to an Australian official and served in the house of commons from 1900 to 1910 as a liberal M.P. In 1910 he was raised to the peerage as first baron of Ratton. He was governor of Bombay, 1913–19, governor of Madras, 1919–24, governor general of Canada, 1926–31 and viceroy of India, 1931–36. He took over the viceroyship at the height of the civil disobedience campaign in India and after negotiations with Gandhi failed to halt the tide of rebellion, Lord Willingdon set out to crush the congress party, driving it underground for a period. In 1936 Lord Willingdon was made a marquess, one of the few commoners ever to achieve this distinction. He died in London Aug. 12.

Willkie, Wendell Lewis (1892–), U.S. attorney, business executive and politician, was born Feb. 18 in Elwood, Ind. After being graduated from the University of Indiana with an A.B. degree in 1913, he taught history in the high school at Coffeyville, Kan., then became a laboratory assistant in a Puerto Rican sugar plant. In 1916 he received his law degree from the University of Indiana and joined his father's law firm in Elwood. During World War I he was a captain in the 325th field artillery in France. In 1929 he joined the legal staff of Commonwealth and Southern, a large utilities holding company. Four years later he was president of the company.

His nomination for the presidency by the Republican convention June 28, 1940, was described as a political "miracle." He was defeated by a substantial margin in the election of Nov. 5, 1940, although he received 22,333,801 votes.

Willkie went to England in Jan. 1941 and was received with great enthusiasm. Upon his return to the U.S. he testified on behalf of the lend-lease bill. He advocated U.S. convoys and establishment of U.S. bases in Northern Ireland and Scotland. These views caused considerable resentment among large sectors of the Republican party. Willkie joined a law firm in New York city in April, and in September he was retained as counsel for various motion picture companies at a senate inquiry into alleged prowar propaganda in U.S. films.

Winant, John Gilbert (1889–), U.S. diplomat, was born Feb. 23 in New York city. He attended Princeton university and in 1912 became a teacher of English and assistant rector at St. Paul's school. In 1917 he entered the United States air service, becoming captain of the 8th observation squadron in France. After the war he was elected to the New Hampshire legislature, serving in both the house and the senate between 1917 and 1923. In 1925 he received his M.A. degree from Princeton for graduate study in government problems. The same year, at the age of 35, Winant was elected governor of New Hampshire; he served three terms, 1925–27, 1931–33 and 1933–35. His administration was marked by numerous social reforms, including enactment of old-age assistance, emergency relief and prevention of foreclosures on farms and factory workers' homes. He was the first chairman of the social security board, 1935–37; president of the World Textile conference, 1937; assistant director of the International Labour office, 1935–38 and director, 1939–41. A wealthy New England aristocrat, a liberal Republican and a supporter of the New Deal program, Winant was named ambassador to Great Britain by Pres. Roosevelt, Feb. 6, 1941.

Windward Islands: *see* WEST INDIES, BRITISH.

Wines. The war in Europe made it impossible to report satisfactorily on the wine vintages of 1940. The extension of the war, which included nearly every country in Europe in 1941, and spread to every continent, made it even more difficult to give any definite information on the wine vintages of 1941.

The principal wine-growing countries of the world—France, Italy, Germany and the Balkans—were in a state of military and political disorder, which relegated their wine harvests to a matter of minor importance, except insofar as the wines could be utilized for the production of alcohol for military and industrial purposes. Very little information was allowed to be made public regarding the wine harvest of any of the European countries actually involved in the war. Only meagre details, therefore, can be given regarding the 1941 vintage in any of these countries.

Information regarding wines in France came chiefly from the Midi, from which it was reported that the vintage was delayed on account of insufficient heat during the summer. The total quantity produced in France would be approximately the same as the 1938 harvest, viz.: something over 1,500,000,000 American gal., a large part of which was of course destined to become alcohol. The older and finer wines of France, which of course also include the choice vintages of champagnes, were forcibly taken by the Germans and shipped to Germany. Old wines were therefore nonexistent and new stocks would be fully requisitioned for home use, leaving none for export.

The wine harvest of Algeria was expected to show a large deficit. The crop was about 250,000,000 gal., much of which would be absorbed by compulsory distillation.

Wine Production of the Principal Wine-Growing Countries of the World

In thousands of American Wine Gallons

1,000 American Gallons Equal 833⅓ British (Imperial) Gallons

Year	Approximate Production	Year	Approximate Production	Year	Approximate Production
	Algeria		France—Con.		Portugal
1936	302,557	1937	1,348,593	1936	97,335
1937	404,853	1938	1,520,085	1937	211,286
1938	587,737		Germany	1938	287,568
	Argentina	1936	110,643		Spain
1937	208,320	1937	89,775	1937	427,285
1938	243,120	1938	87,045*	1938	420,000†
1941	200,000		Greece	1941	220,000
	Australia	1936	45,543		Union of
1936	20,947	1937	88,410		South Africa
1937	16,196	1938	106,181	1936	40,188
1938	23,803		Hungary	1937	37,210
	Chile	1936	119,122	1938	42,813
1937	93,082	1937	117,416		United States
1938	94,342	1938	85,548		of America
1941	61,000		Italy	1937	99,413
	France	1930	953,452	1938	70,665
1930	1,102,788	1935	1,208,096	1939	74,768
1935	1,917,247	1936	883,155	1940	101,064
1936	1,030,875	1937	892,520	1941	92,000
		1938	1,252,545		

Source: From the *Annual* of the Office International du Vin, the U.S. Tariff Commission and the Wine Institute of California.
*Including Austria 22,391,200 gal. and the Sudeten 2,362,500 gal.
†Estimated production.

From Italy no information regarding wines was obtainable.

From Spain it was learned that in the Jerez district the vintage was concluded much earlier than usual and was blighted by rain during the vintage period. The quantity was down to less than 50% of the amount normally produced, and the strength of the wine suffered as a result of the heavy rains during the spring and up to the end of July. The increasing difficulties which the Spanish government imposed upon the export trade through its currency regulations reduced the exportation of sherries to a minimum.

In Portugal the 1941 quality of wines promised to be satisfactory. The Wine Farmers association, in view of the falling off in the export trade, limited the quantity of port wine to be produced to 25,000 pipes as against the 40,000 pipes of which the production was authorized in 1939 and 1940. The export business from Oporto suffered greatly because of restrictions placed upon the importation of these wines by Great Britain, which had for many decades been the principal market for port wines.

From Germany no wine reports were obtainable. Inquiries regarding the wine harvests in Hungary, Greece, Rumania and other European wine-growing countries were equally fruitless.

Western Hemisphere.—The picture in the western hemisphere was more pleasing. While the quantities of grapes raised in the United States were somewhat smaller than the 1940 figures, the quality of the wines, as a result of favourable weather conditions and improved methods of production, promised to be of a high standard. The harvest was favoured by good prices to the growers and an active market for all varieties of grapes. Wine and brandy prices strengthened in keeping with the higher grape levels. While the quality was considerably above average, the quantity produced on the Pacific slope was estimated at about 10% less than the 1940 harvest. The wine harvest of the Atlantic seaboard was only 60% of the normal quantity but with a promise of good qualities.

The demand for North American wines was greatly stimulated by the interruption to the importation of European table wines, as a result of the war, and by a judicious and generous advertising campaign. The increase in the consumption of American wines resulted also in a better appreciation of the qualities of wines which had in the past seldom come to the attention of the discriminating consumer but, because of constantly improving methods of production and fuller maturity, were entitled to more favourable consideration than had heretofore been given to them. There was no doubt that North American wines would to a substantial extent, even after the war, replace the district wines which were formerly imported from France, Italy, Germany and other European wine-growing countries.

From South America it was reported that the Argentine wine crop was very successful in respect to quantity, amounting to over 200,000,000 American gal., whereas Chile reported that the harvest was smaller than that of 1940, the unofficial estimate being approximately 61,000,000 American gal. However, both countries suffered largely through the fact that the greatest market for these wines in former years was Germany, with which all commercial relations had of course ceased.

No report of the 1941 vintage in South Africa or Australia had been received up to Jan. 1, 1942, but it was known that there was a large overproduction in both of these countries owing to the lack of facilities for transporting their wines to Great Britain, which had always been their chief export market.

To sum up, 1941 from a vinicultural standpoint must be recorded as a year of uncertainty in most of the countries of production, with an almost complete disruption of normal conditions in the European vineyards and in the export and import trade.

A table of the approximate production in the principal wine-growing countries of the world is to be seen above. (A. WI.)

Wisconsin. One of the north-central states, Wisconsin, popularly known as the "Badger state," was admitted to the union in 1848. The state comprises an area of 56,154 sq.mi., of which 54,715 sq.mi. are land. Its population, according to the 1940 census, was 3,137,587, an increase of 6·8% over 1930. Of this population, 1,679,144 was urban and 1,458,443

rural. The male population was 1,603,806 as compared with 1,533,781 female. Of the entire population only 24,327 were not white. The capital is Madison (pop. 1940, 67,447). The largest city is Milwaukee with a population in 1940 of 587,472. Other large cities are Racine (67,195), Kenosha (48,765), Green Bay (46,235), La Crosse (42,707) and Sheboygan (40,638).

History.—Upon the death of Stephen Bolles, congressional representative from the first district, a special election was held in 1941. The Republican candidate, Lawrence H. Smith, was pitted against a Progressive, Thomas R. Amlie, who ran on the Democratic ticket. Amlie, who stressed support of Roosevelt's foreign policy, was defeated by a 2-to-1 vote.

The legislature passed a number of important measures. The Model Sabotage Prevention act prohibited and penalized intentional interference with the defense program. The State Guard act created a militia in the absence of the national guard. Communists were barred from the ballot. Military training at the state university was made compulsory. Various civil service laws were passed to protect the rights of those in military service. Safety and traffic regulations included a law under which all drivers must renew their licences every four years. An amendment to the constitution permitting instalment payment of real estate taxes was submitted to the electors and ratified. The Unfair Sales act was clarified and strengthened. The teachers' tenure law of 1937 was repealed.

The chief officers of the state in 1941 were United States Senators Robert M. La Follette and Alexander Wiley and Representatives (Republican) J. L. Johns, L. H. Smith, W. H. Stevenson, L. D. Thill, F. B Keefe, R. F. Murray, (Progressives) Merlin Hull, B. J. Gehrmann, Harry Sauthoff, and (Democrat) T. F. B. Wąsielewski. The state officers were J. P. Heil, governor; W. S. Goodland, lieutenant governor; F. R. Zimmerman, secretary of state; J. M. Smith, treasurer; J. E. Martin, attorney-general; and John Callahan, superintendent of schools. The chief justice of the supreme court was M. B. Rosenberry.

Education.—There were 7,442 elementary schools, 464 secondary schools, and 9 teachers' colleges in September 1941. The number of students enrolled was 374,854 in the elementary schools, 160,311 in the secondary schools and 5,976 in the teachers' colleges. The number of teachers in these was 15,415, 6,162 and 470 respectively. The number of students enrolled in the state university was 10,545, the number of faculty members, approximately 1,736.

Public Welfare, Charities, Correction.—The number of cases receiving public assistance as of August 1941 was as follows: general relief, 22,598; WPA, 22,200; old-age assistance, 54,202; aid to dependent children, 12,236; aid to blind, 1,977—a total of 99,891. Expenditures for public assistance in 1940 were as follows: general relief, $14,907,974; WPA (July 1939–June 1940), $37,885,000; old-age assistance, $13,920,405; aid to dependent children, $5,726,585; aid to blind, $563,270; a total of $87,132,436. The amount spent for public assistance from January through March 1941 was $21,085,388. Wisconsin's unemployment compensation law was passed in January 1932. By the close of 1940, nearly $20,000,000 had been paid in benefits. More than $55,000,000 was held in trust. The benefit payments in 1940 were $4,584,529 as against $3,663,572 in 1939. The contributions in 1940 were $11,666,453; in 1939, $13,419,778. Wisconsin's 17 charitable penal and allied institutions were operated during July 1939–June 1940 at a cost of $4,980,797.41 (less repairs, etc.). The average daily population in 1940 was 79.35.

Communication.—The number of miles of highways as of Jan. 1, 1940 was: 83,881 (towns), 2,469 (villages), and 5,767 (cities). The total was 92,117. The expenditure on highways during July 1939–June 1940 was $33,659,374. The total railway mileage was 6,667. The number of airports was 47. In January 1941, there were 557,200 telephones.

Banking and Finance.—At the end of 1940 there were 469 state and 99 national banks. The number of credit unions was 592. The deposits in state banks totalled $446,244,273; the assets were $509,194,172. National banks had on deposit $613,422,000; their assets were $676,835,000. The credit unions had assets listed at $11,238,678. There were 124 building and loan associations with assets of $116,747,368.

The state receipts during the fiscal year ending June 30, 1941 were $147,784,514. The disbursements were $139,557,201. The state had no outstanding bonded indebtedness in 1941 but its General Fund was indebted to the common and normal school funds ($1,183,700). The state budget for the biennium 1941–43 was $73,868,278, greater by $2,656,302 than the 1939–41 budget. The principal increases were for pensions, the University of Wisconsin and teachers' colleges. The principal decreases were related to relief and governmental expenses.

Agriculture.—The total value of agricultural products in 1940 was $175,584,000. The total acreage harvested was 9,815,964. The gross farm income was $334,000,000, an increase of 15% over 1939. The year 1940 was a very good crop year except for potatoes, usually one of the leading cash crops. The land used in the production of cash crops was small compared with land used for feed crops—the result of the state's great dairy industry. Principal crops are shown in Table I.

Table I.—*Agricultural Production, 1940 and 1939*

	1940	1939
Oats (bu.)	96,793,000	71,012,000
Corn (bu.)	93,582,000	85,970,000
Canning peas (lb.)	182,700,000	100,400,000
Tobacco (lb.)	36,532,000	31,406,000
All tame hay (tons)	7,416,000	5,829,000
All clover and timothy (tons)	3,644,000	3,143,000
Alfalfa (tons)	2,928,000	1,072,000

Manufacturing.—The total value of Wisconsin's manufactured products in 1939 was $1,604,507,356, placing it 11th in rank among the states. The wages paid were $251,946,993. The number of wage-earners was 200,897 (average for the year). Wisconsin, with an extremely diversified industry, ranked first in the manufacture of cheese, milk products, malt and canned peas in 1939. Principal industries, with value of products in dollars, are shown in Table II.

Table II.—*Industrial Production, 1939 and 1937*

	1939	1937
Motor vehicles	$162,080,952	$90,700,733
Paper and paperboard mills	101,302,409	97,933,597
Meat packing, wholesale	80,234,982	72,387,364
Tractors	68,493,028	(not given separately)
Malt liquors	53,445,756	42,710,425
Dairy products		
Cheese	52,900,812	54,252,393
Condensed and evaporated milk	54,510,935	57,354,882
Creamery butter	48,217,531	63,032,363

Mineral production.—In 1939 the total value of mineral production was $12,704,942 as against $10,636,741 in 1938. Leading mineral products, in dollars, are shown in Table III.

Table III.—*Value of Mineral Products, 1940 and 1939*

	1940	1939
Stone	$5,030,263	$3,564,045
Iron ore	3,290,389	3,526,980
Sand and gravel	2,304,197	2,616,204

(L. Kn.)

Wisconsin, University of.

An institution of higher education at Madison, Wis. Regular session enrolment (1941–42) totalled 10,545, a slight decrease from that of the preceding year. Total enrolment, including both regular and summer session, extension and short course registrations, reached a total of more than 45,000 in the year. The university continued its work to help the United States' defense efforts during the year.

The university's president, C. A. Dykstra, served as first director of selective service and, later in the year, as chairman of the National Defense Mediation board. In addition, 160 scientists of the faculty were engaged in science research in Dec. 1941, either in their university laboratories or in laboratories provided by the federal government for investigation of various phases of national defense problems.

The university also continued to show progress in its science work during 1941. Another science symposium was held on the campus in the fall, and the National Academy of Sciences held its fall meeting at the university in October. These two science meetings brought to Wisconsin many of the leading scientists of the U.S. in various fields. The science symposium on "Respiratory Enzymes and the Biological Action of Vitamins" drew the attention of 350 leading U.S. biochemists and medical men, while more than 300 of the nation's top-ranking scientists, representing all the physical and biological sciences, attended the sessions of the National Academy. More than 2,000 students received degrees at Wisconsin's June commencement, the 88th in the university's 92-year history. (R. Fs.)

Woman's Christian Temperance Union.

The fact that more than 25,800 women joined the organization in the first nine months of 1941, that similar increases were made in the two branches, the Youth's Temperance council and the Loyal Temperance legion, is warrant that there was increasing interest in the organization's work. More than 1,000 new organizations were formed, which meant many new centres to work out the objectives sought: total abstinence from alcoholic beverages, and the abolition of the liquor traffic. The six seminars on alcohol education sent 50 trained specialists into teachers' colleges. The course on alcohol education offered in these seminars has been accepted by seven colleges for academic credit. The acceptance of brief courses for summer schools is increasing. Three motion pictures were in circulation. These dealt with the scientific, social and economic effects of alcohol. They were on high school and adult levels. Film strips for classroom use in the grades, dealing with health, safety and economics, were available. Exhibits and many varieties of visual demonstrations were but a few of the special features of the year. The weekly magazine, the *Union Signal*, a journal of social welfare, and the *Young Crusader*, a children's paper, were increasingly added to libraries, both public and school.

The national officers in 1941 were: Mrs. Ida B. Wise Smith, president; Mrs. D. Leigh Colvin, vice-president; Mrs. Anna Marden DeYo, corresponding secretary; Mrs. Margaret C. Munns, treasurer; and Mrs. Nelle G. Burger, recording secretary. National headquarters, Evanston, Ill. (I. B. W. S.)

Women's Clubs, General Federation of.

The General Federation of Women's Clubs is an international federation of 16,000 clubs and organizations, representing a total membership of more than 2,000,000 women. Clubs were in 1941 in more than three-fourths of the counties of the United States, in four territories, and in 26 other countries. Headquarters in 1941 were at 1734 N street, Northwest, Washington, D.C.

The General Federation began with the 21st birthday celebration of Sorosis club of New York city, when women from 61 clubs, representing 18 states, decided to draft a constitution and plan of organization for a federation of women's clubs. The plan was ratified in New York city, April 1890. In 1901 the organization was granted a charter by the United States government.

The golden jubilee convention, in Atlantic City, May 1941, climaxed a year of nation-wide celebration. At this convention Mrs. John L. Whitehurst of Baltimore was elected 15th president.

The new administration immediately established a national defense department with 14 committees to promote a defense program and co-operate with the United States Office of Civilian Defense. Clubs and clubwomen responded immediately by purchasing defense bonds, registering for emergency service, conducting nutrition classes, promoting Americanism forums, sponsoring the recruiting of air pilots, conserving defense products, promoting adequate defense housing, providing recreation for men in camp, promoting home nursing and first-aid classes, assisting through scholarship funds enrolment for professional nurses' training, encouraging Pan-American friendship through establishment of additional Pan-American fellowships and the sponsoring of Spanish classes.

In June 1941, Mrs. Whitehurst called a national defense conference in New York city which was attended by women leaders of 100 national organizations. During 1941 plans were completed for a national defense forum of 1,000 club leaders, to be held in Washington, D.C. early in 1942. With the Sept. 1941 issue, the General Federation changed the policy of its official organ, the *General Federation Clubwoman*, to a magazine devoted entirely to the promotion of national defense. (S. A. W.)

Wood, Robert E. (1879–), U.S. soldier and business executive. He was born June 13 at Kansas City, Mo., graduated from West Point in 1900 and saw active service in the Philippines during the next two years. From 1905 to 1915 he was assistant chief quartermaster and chief quartermaster and director of the Panama Railroad company during the construction of the Panama canal. He left the army to engage in private business in 1915 but returned upon the United States' entry into World War I and was promoted to brigadier general. In 1918 and 1919 he was acting U.S. quartermaster general, and in the latter year he re-entered business as vice-president of Montgomery Ward & Co. in Chicago. He was vice-president of Sears, Roebuck and Co. in Chicago from 1924 to 1928, president from 1928 to 1939, chairman of the board since Feb. 1939.

General Wood, who supported Roosevelt in 1932 and 1936, parted ways with the New Deal in 1940 because of the administration's foreign policy. Believing that "all-out" aid to Britain would weaken U.S. defenses and threaten to involve the nation in war, he organized the America First committee to oppose intervention in the European conflict. Through 1940 and 1941 he continued his opposition to such intervention and to the measures (lend-lease bill, U.S. occupation of Iceland, request for use of U.S. forces overseas, etc.) which he believed would bring it about.

With the Japanese attack on Pearl Harbor Dec. 7, 1941, General Wood declared his unqualified support of the national government in its prosecution of the war.

Wool. Estimates of sheep in the world during 1941 were figured at 767,300,000, growing 3,900,000,000 lb. of wool. The Australian clip was computed at 1,099,000,000 lb.; South America, 600,000,000 lb.; United States, 399,941,000 lb.; New Zealand, 330,000,000 lb.; Union of South Africa, 200,000,000 lb. United States imports of apparel wool totalled 688,000,000 lb. in the first ten months of 1941 compared with 158,500,000 lb. during the same period in 1940. As of Nov. 30, 1941 the U.S. domestic mill consumption of wool amounted to 833,000,000 lb. compared with 605,000,000 lb. for the 11 months in 1940.

It was estimated that 300,000,000 lb. of grease wool would be required solely for U.S. government orders placed during the calendar year of 1941. This amount approximated 174,000,000 lb. of domestic grown wool and 126,000,000 lb. of foreign. Invitations for bids on these contracts were on three bases: all domestic wool; part domestic, part foreign; all foreign.

The closing of many outlets for wool, brought on by World War II, left but the markets of Great Britain and the United States, with possibly Sweden, open for the large producers in Australia, South America and South Africa. During 1941 the United States purchased approximately 250,000,000 lb. of the Australian clip, 32,500,000 lb. of the South African clip and 500,000,000 lb. from South America. The British Wool Control board, having purchased the Australian and South African wool clips at relative figures, established market prices for these wools. Comparative grades of domestic wools commanded a premium of about ten cents a pound clean basis, because of the fact that a differential was considered when awarding government orders, to compensate the wool growers in the United States for increased cost of production. On July 17 a list known as "The Proclaimed List of Certain Blocked Nationals" was authorized by President Roosevelt. This list included many large wool exporters to the United States, principally in South America.

On Oct. 1 the new method of determining the clean content in wool and hair by the treasury department was put into effect.

This method consists of boring wool bales, thus obtaining samples which are afterward laboratory tested for clean content. Previously, the visual method was used by customs appraisers. On Oct. 14 a trade agreement between the United States and Argentina was signed. Under the most-favoured-nations treatment, concessions by the United States apply to all nations except Germany. The agreement went into effect Nov. 15. The duty on wools, not finer than 40s, was reduced by 11 cents per lb., of clean content; not finer than 44s, by 12 cents. On Oct. 22 an official announcement was made, stating that the United States government purchased all the Australian wool in store or on the water, destined for the British reserve storage, amounting to approximately 125,000,000 lb., plus any additional quantity that could be shipped before Dec. 31, provided grades were within the standards specified, namely: nothing lower in quality than 60/64s. This wool was bought at 10% less than the export issue price list, f.o.b. Australian port. In conjunction with this transaction, the British government agreed to ship to the U.S. for storage in their name 125,000,000 lb. of South African wool, provided it were shipped before Dec. 31.

The Office of Price Administration established ceiling prices on wools, both foreign and domestic grown, in Jan. 1942. These prices were based on the highest prices contracted for or received by the seller for the sale or delivery of wools during the period between Oct. 1, 1941 and Dec. 15, 1941. Requests were made from Washington of total stocks of wool on hand or afloat, according to grade and condition. (*See* also SHEEP; TEXTILE INDUSTRY.)

(C. M. AN.)

Woolf, Virginia (1882–1941), British novelist and essayist, the daughter of Sir Leslie Stephen, English philosopher and man of letters, was related to the Darwins, Symondses and Stracheys and was a granddaughter of Thackeray. The famous writers of that period, Stevenson, Ruskin, Lowell, Hardy and Meredith, frequently visited her father's home, and as the wife of Leonard Sidney Woolf, editor and writer, she was surrounded by a coterie of literary lights in her own home. For more than 20 years the Woolfs controlled the Hogarth Press, but in 1938 Mrs. Woolf retired to devote more of her time to writing. Among her later works were *The Waves* (1931); *The Common Reader, Second Series* (1932); *Flush* (1933); *The Years* (1937); *Three Guineas* (1938), *Roger Fry, a Biography* (1940) and *Between the Acts*, a novel published posthumously in Oct. 1941. Twice bombed from her home by German air raiders, Mrs. Woolf, who had been ill and depressed, disappeared from her weekend house at Lewes, Sussex, March 28, leaving behind a suicide note to her husband. (See *Encyclopædia Britannica*.)

Work Projects Administration: *see* FEDERAL WORKS AGENCY.

Works Agency, Federal: *see* FEDERAL WORKS AGENCY.

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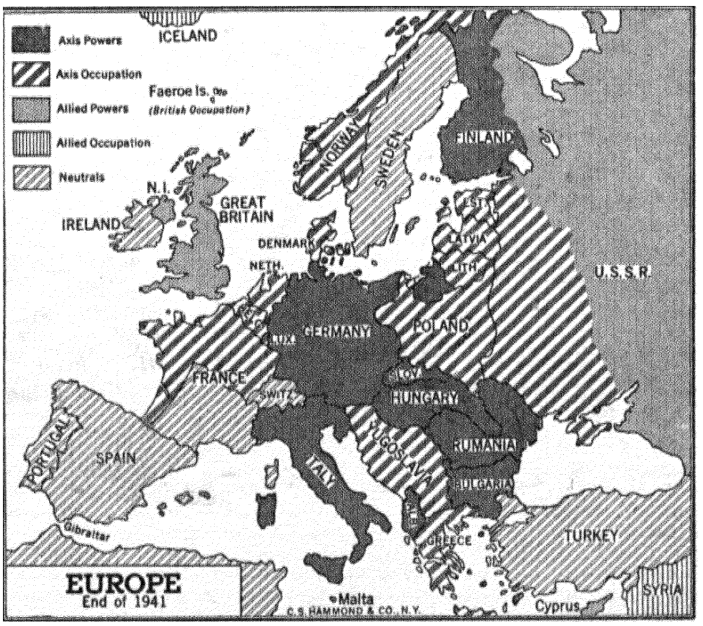
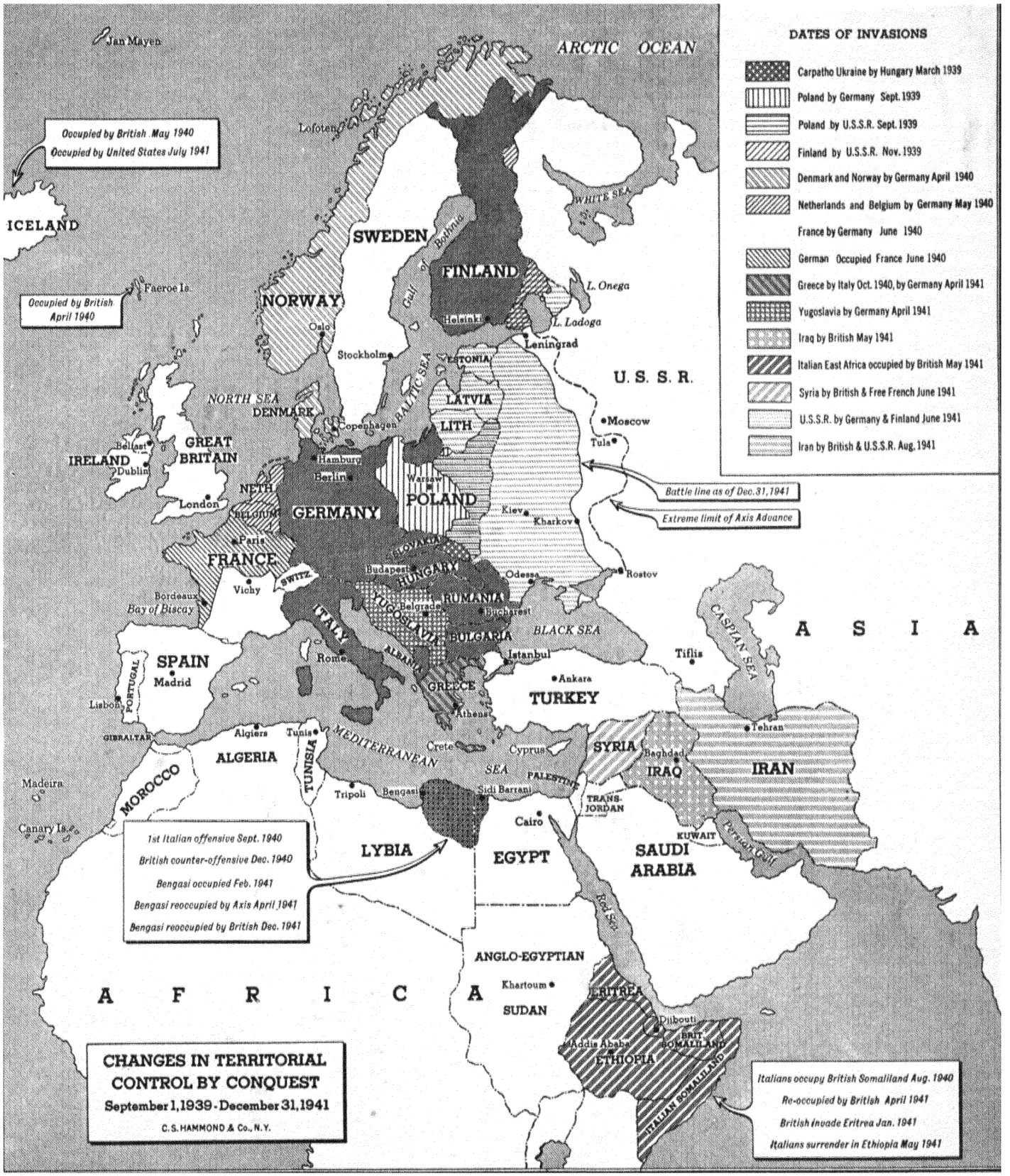
I. Introduction.—On Sept. 1, 1939 two nations were engaged in war when Germany invaded Poland. In the succeeding 28 months a grand total of 31 nations had become involved in warfare. What began as a European war confined principally to the western European area, became in 1941 a world war with the conflict spreading around the globe bringing war on land or sea or in the air to most of the small and great nations of the world. During 1940 the German armies had swept across western Europe, eliminated the major organized forces of Britain and France from the continent, overrun smaller European nations, and rapidly organized most of the continent within or subject to the threat of German control. During 1941, Germany completed military operations securing control of the Balkans, maintained overseas forces operating with Italian allies in North Africa, threatened the Suez and the Dardanelles by the capture of Crete, extended the air and naval warfare in the Battle of Britain, opened a major offensive war against Russia, gained a new ally by supporting the resumption of war by Finland, and in December joined Japan and Italy in a declaration of war against the United States.

The distance in time appeared tragically short between Munich and Hawaii. The speed with which the conflagration spread changed the character of the original European war of 1939 and posed grave military issues for all nations in the future. The scale of all of these events defies accurate analysis within a single study. The military events alone can be examined solely within the limitations of available information secured under the restrictions of war-time censorship.

II. Military Operations.—A. The Balkan Campaign.—The nations engaged in the Balkan campaign during 1941 included Italy, Germany, Hungary, Rumania, Yugoslavia, Bulgaria, Greece and the British empire. For the most part all operations were confined to air and ground activities with the exception of initial naval escort and convoy duty by units of the British fleet and the later naval and air engagements at the close of the campaign. The decisive actions were the result of air and ground combat.

1. **Objectives:** The German objective in this campaign was to deny the land area of the Balkan peninsula to British forces and to secure a route leading to the area occupied by main British armies in the eastern Mediterranean. This action no doubt included future steps for the capture of the strategic island of Crete. Secondary objectives included the rescue of Italian forces engaged in cumbersome combat with Greece, the elimination of Greece as a British ally, the reduction of potential opposition in Yugo-





slavia, the extension of the German political and military control in Rumania and Bulgaria, and the addition of all available supplies and sources of supplies for future German war needs.

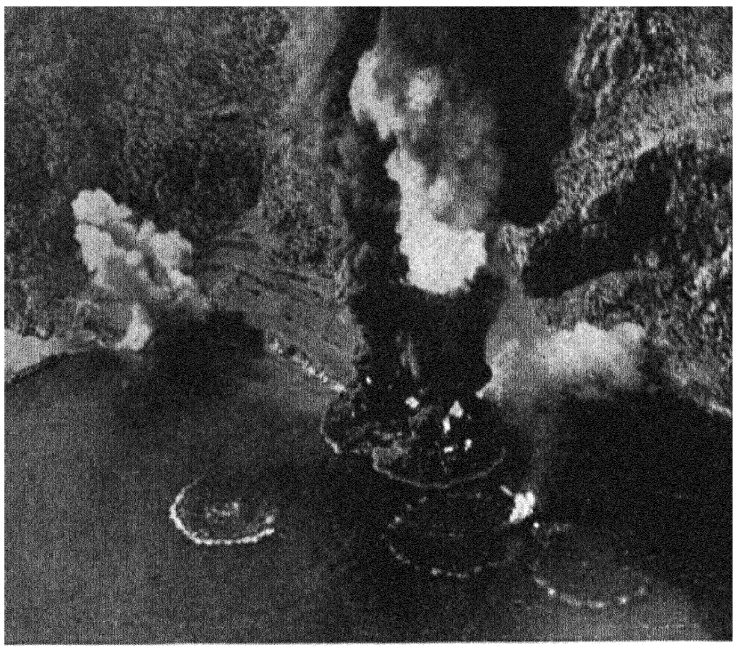
The Greek forces already engaged in major warfare with Italian forces sought to defend their home front and to secure an area for future attack in company with British allies.

The British objective in compliance with treaty guarantees was to support the Greek efiorts against Italian aggression, and to secure a European land base for future use in resuming an offensive against Germany.

2. **Plans:** The German plan of operations appeared to have been a simple advance to the southeast and south seeking to strike the main British and Greek forces and destroy them. In detail this basic plan included the political control of Rumania and Bulgaria to secure an advance base of operations, the separation of Yugoslavia from Greece and the destruction of the Slav forces. In addition, Germany sought to unite her forces with Italian forces in Albania by an advance west from Bulgaria.

Italian campaign, and in the other because of necessary requirements for African defenses, adopted a purely defensive plan. Only limited British air and ground forces were available. The whole British effort appeared to be more a compliance with treaty provisions than a determined attempt to seek decisive results. The number of British troops engaged suggested a token force. The plan included a defense along the Bulgarian border coupled with renewed attacks to the west against Italy and the addition of strong resistance in the north by Yugoslavia. The Yugoslavian forces were committed to adoption of the defense of the frontier, but could not be counted upon to join in any co-ordinated plan of joint British and Greek campaign.

3. **Forces:** The forces involved are estimated approximately as follows: Yugoslavia, 550,000 including 15–20 divisions, 500–700 planes, and without adequate reserves of trained manpower or modern supplies; Greece approximately 300,000 including 15 divisions with less than 100 planes operated by British and some Greek aviators. For the most part, the bulk



NAZI BOMBERS harried the British expeditionary force as it evacuated Greece in the last days of April 1941

pected to assist the British during the German campaign; British troops were estimated at 6 divisions, approximately 100,000, including about 150 planes and small naval craft in support. These actual and potential allies combined, presented approximately 1,000,000, with more than 50% of the total represented by the Yugoslavian forces as yet untried in battle and subject to the serious danger of national disorders within the home front.

The German forces in the Balkan area since early in January had been increased to approximately 550,000.

The German system of assigning specially designed task forces had been carefully carried out in the creation of this Balkan army. Air and ground forces were placed under responsible commanders charged with specific missions under a single supreme commander responsible for the whole campaign.

In addition, the Germans could count upon increased assistance as soon as the Italian forces in Albania resumed the offensive and a union of forces could be made.

Operations: The initial moves made by Germany were launched from Bulgaria against Yugoslavia. These forces sought to separate the Yugoslav forces in the southeast from those to the north. One German column overran the small Croatian divisions along the frontier and reached the valley of the Vardar river. At this point the German column split into two parts, one part continuing to the west and southwest to join Italian forces in Albania, the other part turning south through the Vardar valley in the direction of Salonika. Other German columns invaded Yugoslavia from the Struma valley west towards Skoplje, through the Dragoman pass towards Nish, southwest from Rumania toward Belgrade, and in the north across the frontier towards the cities of Ljubljana and Zagreb. Along the Bulgarian-Greek border, German forces invaded southward toward Salonika.

Success in northern Yugoslavia was assured by the capture of the principal cities of Ljubljana, Zagreb and Belgrade. Political dissension resulted in the establishment of a separate Croat state, and weakened the potential strength of Yugoslavian resistance. In the southeastern part of Yugoslavia strong resistance was overcome in the Vardar valley, and Serbian forces were separated from the Greeks. In Greece, Salonika was captured and eastern Thrace cut off from the remaining Greek and British forces. Junction was made between German and Italian columns on the sixth day of the invasion when advance elements met in the vicinity of Struga.

Specially trained and equipped mountain troops were used by Germany. In all cases, German armoured forces operating with close and continuous air support, drove Allied forces to the south, overran defensive positions all along the British-Greek front, and meanwhile threatened rear area installations by heavy air bombing attacks.

Between April 6 and April 8, the initial German attacks succeeded in separating the Yugoslav forces from the Greek forces along the Bulgarian frontiers. This defeat resulted in opening an approach for German columns directly to the Monastir gap at the approximate junction of the Albanian, Yugoslavian and Greek frontiers, and also at the centre of the first British-Greek defensive position. It appears that this gap at Monastir was lightly defended by small Greek forces. Main Greek forces were engaged with Italian troops to the west in Albania. Main British forces were engaged with German columns to the east in Thrace. This disposition of Allied forces had been made dependent upon the ability of the Yugoslavs to delay the initial advances of the German columns operating in the direction of the Vardar river.

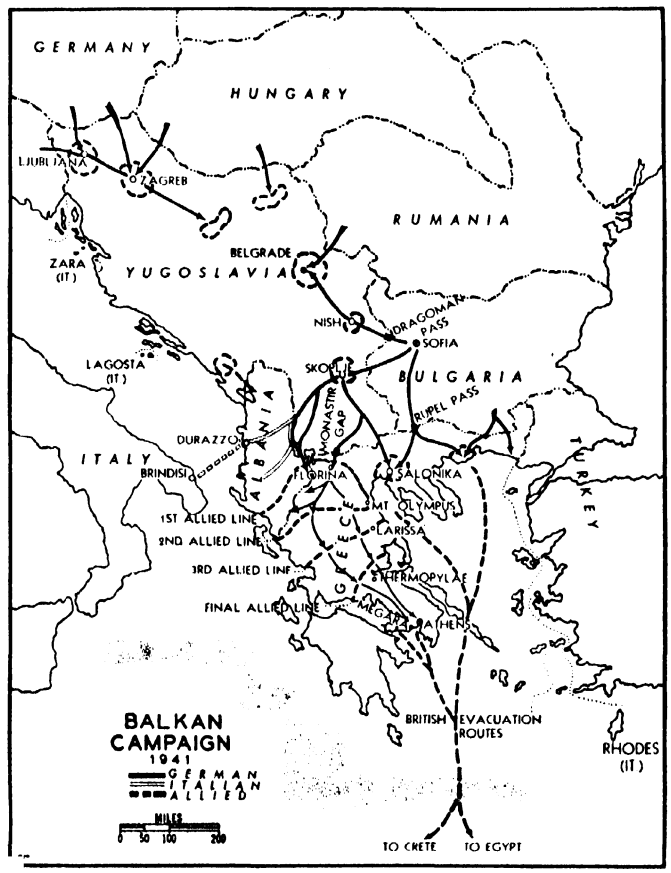
On April 9 the British forces, principally made up of Australians, reinforced the Greek garrisons in the Monastir gap area. By April 11 it was evident that this position was untenable and during the period April 11–14 the defensive action was withdrawn first to a line running to the west from Mt. Olympus. When the flank and rear of this line was threatened, a second withdrawal was made to an area around Thermopylae. Here the New Zealand forces held the right (east) and the north of the line, while the Australians held the left (west) flank. For a period of about one week, British forces had been required to fight without substantial assistance from the Greeks. On April 21 the Greek forces capitulated in the west. The result was that large German forces were released for attack against the British position.

During the period April 22 to April 24, the British forces fought a stubborn defense in the vicinity of Thermopylae. The German control of the air and the constantly increasing strength of armoured and mechanized forces made the British position hopeless. The British plan for evacuation was carried out successfully but with considerable losses. During the hours of darkness on April 24–26, the British reported that 19,000 troops had been evacuated from the port of Megara west of Athens. On the third night, 16,000 were evacuated. Further evacuation was less successful, although small forces were cleared near Peloponnesus where more than 700 were rescued. At the close of the campaign, British claims indicated that from all sources about 45,000 had been evacuated from the area. By May 1 the major hostilities had ended and minor actions consisting of local guerrilla warfare in remote Albanian and Yugoslavian mountain districts, and mopping up actions along beaches and within scattered villages, were continuing.

Summary: The Balkan campaign began on April 6, 1941 and major operations were completed in about three weeks ending with the British evacuation by May 1, 1941. Results indicate that the German objectives were achieved in all particulars, while the British and Greek forces, as well as the Yugoslav troops, suffered complete defeat. For Yugoslavia the results of two-day combat found the effective defensive power of the nation scattered and the organized forces rapidly disappearing. Political weakness had prevented unified action, and revolts within the state precluded the adoption of a strong defense. The military operations were brief, but according to nazi reports more than 300,000 Serbian prisoners had been captured. It is difficult to estimate results alone in the light of military values. The Yugoslav capacity to resist had disappeared. No organized army existed to defend the country. The area occupied afforded Germany not only strategic security, but also specific if limited supplies of raw materials, control over all available industrial potentials, and considerable booty in the form of modern war equipment. Yugoslavia lost control of the Adriatic coast line to Italy, and faced the necessity of supporting both Italian and German occupation forces controlling all military objectives within the state. On all fronts, military, political and economic, the Yugoslavs lost national identity.

Greece lost heavily in the Balkan campaign. After months of valiant defense against Italy, and at times approaching the possibility of victory over this invader, Greece was overrun by strong German invasion forces. Germany claimed more than 200,000 Greek prisoners and considerable war equipment. Along with Yugoslavia, bewildered within and rapidly defeated from without; Bulgaria, overrun without resistance and weakened by failure to achieve unity; and Rumania, long since subject to nazi control; the small, unified, defiant Greek nation, whose brave struggle had won the praise of democratic peoples and the support of the British, fell before superior force despite valiant efforts to resist.

The British lost the great opportunity to secure a base on the continent from which future attacks might be launched against Italy and Germany. The loss of an ally, Greece, was secondary in military importance so far as strength in numbers and equipment was concerned. This loss was of primary importance so far as the strategic value of the Greek land and sea areas was concerned. In addition, the unstable character of the governments in Rumania, Bulgaria and in Yugoslavia, all subject to the control of the most powerful invader, might have been swung to the side of the Allies if the British had been able to repulse and eventually advance north-



ward against Germany.

The official British reports on the campaign claimed no more than 60,000 as a total for the forces involved in the campaign. The British claimed about 45,000 had been evacuated, indicating over-all losses of about 25% in manpower. Of this potential loss, the German claims indicated approximately 9,000 British had been taken as prisoners.

British naval losses were admitted to include a destroyer, an escort vessel and four transports. This indicates about 30,000 tons. Considerable armoured equipment was lost, and although claimed to be destroyed before falling into German hands, all abandoned equipment was lost for British use. British available air forces had been small and the relatively few planes in action had been destroyed or withdrawn.

Germany claimed over 500,000 prisoners, 500,000 rifles, 1,000 guns, thousands of machine guns, vehicles and large amounts of ammunition. More than 300,000 tons of shipping constituted the German report of Allied losses in naval and air warfare. Germany admitted losses of 300 officers and 5,000 men killed, wounded or missing in action.

The military action appears to indicate the following factors contributing to German success:

a. Concentration of well-balanced task forces—even including specially prepared mountain troops—adequate in strength and equipment, trained and organized for a particular mission and operating under a single commander.

b. Close and continuous co-ordination of all air-ground operations.

c. Battlefield mobility and the rigid adherence to the single over-all mission—the relentless pursuit, encirclement and ruthless destruction of the main forces of the enemy.

British failure is indicated by:

a. Lack of adequate strength and subsequent inability to organize a co-ordinated defense.

b. Lack of equipment, particularly in air forces.

c. Inadequate naval strength, preventing replacements of men and materials.

The final results of the Balkan campaign indicated a strong advance by still victorious German armies, the acquisition of valuable territory for supplies, the denial of any land-base area to Britain and her allies on the continent and the German approach to the Suez and eastern Mediterranean. As for the British, it might be said that when faced with a difficult choice, they exercised wisdom in sending a token force to aid Greece and at the same time to gamble for bases for future operations. As it turned out, the gamble was lost and the token force was of no value, except to give a semblance of honouring treaty obligations.

B. Crete.—The German conquest of Crete was accomplished during the period May 20–June 1, 1941. A military analysis of the campaign indicates that the outstanding military development was the employment of air forces in this operation. Reports indicate that this was the first occasion in military history of the transportation, supply and support of an expeditionary force by air against a position defended by superior naval and land forces. The nations involved in this campaign include Germany, Italy, the British empire and Greece.

1. Objectives: The German army sought to secure a land base in the Mediterranean for air operations against Allied fleet operations, against land bases and sea bases in North Africa and the Suez canal, and in support of axis land operations in Libya. Secondary objectives included the denial of a land base to the British for air operation against German-controlled oil fields in the Balkans, against axis fleet operations along the island route from the Black sea to the Adriatic, the opportunity to further political pressure on Turkey to join the axis powers and the establishment of a base for any future military operations in the near east. The British objectives in this campaign appear to have been the defense of the island of Crete in order to deny the site to the axis powers, and to retain the military advantages which the island afforded the British and their allies.

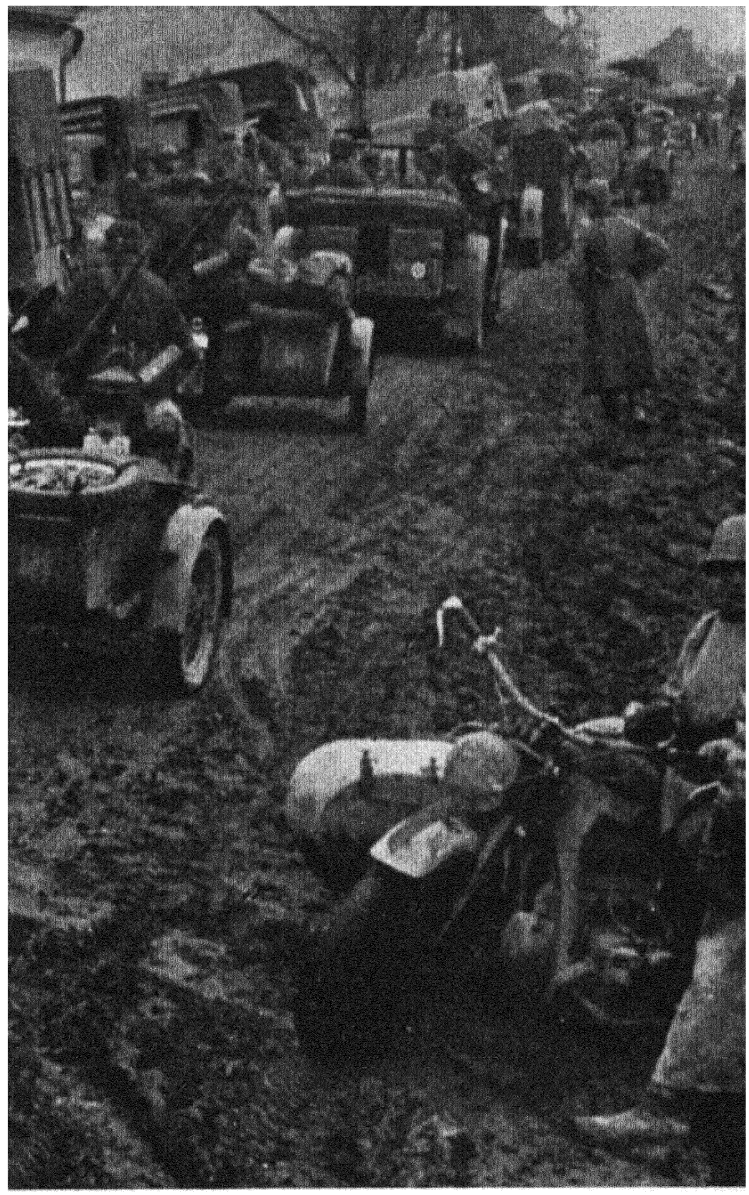
2. Plans: The German plans were based upon a principal reliance on their air forces to accomplish the objectives of this campaign. Early in May the German armies had completed the conquest of the Balkans. Adequate ground forces existed and supplies were considered ample for an attack against Crete. Naval forces were entirely inadequate. The final plan included an air attack against the royal air force to establish air superiority, the air operations against the royal navy to overcome naval superiority, air transportation of land forces to the theatre of operations, air support for landing forces and an air combat force to secure success for land operations. The outstanding element of this German plan was that all operations were placed under a single responsible commander. This meant that air, land and naval forces were to be employed as one man decided. This contrasts somewhat with the absence of a unified command in the British plan described below.

The British plans for the defense of the island of Crete included the disposition of ground forces to protect the airfields, and to protect the naval base at Suda bay. The British plan indicates that the defense was based upon maximum dispersion of available ground forces to defend likely areas of German attack, coupled with some reliance on small air forces and the limited employment of superior naval strength when operations permitted such use. It must be emphasized that all British plans were subject to the independent actions of the three separate and separated British land, air and naval commanders. These commanders were located in Cairo in Egypt. The naval commander during a part of the operations was in command of naval units with the fleet in the Mediterranean. The air force commander was in Cairo reorganizing air forces and taking instructions from the air ministry in London. The ground force commander was similarly in Cairo, reorganizing the British army in North Africa, and his higher headquarters directing his operations was also located in London.

Table I.—*List of Nations Engaged in War at the Close of 1941

The United Nations		The Axis
Australia	India	Albania
Belgium	Luxembourg	Bulgaria
Canada	The Netherlands	Finland
China	Netherlands East Indies	Germany
Costa Rica	New Zealand	Hungary
Cuba	Nicaragua	Italy
Czechoslovakia	Norway	Japan
Dominican Republic	Panama	Rumania
El Salvador	Poland	Slovakia
Ethiopia	Union of South Africa	
Free France	United Kingdom	
Greece	United States	
Guatemala	U.S.S.R. (Not at war with Japan)	
Haiti	Yugoslavia	
Honduras		

*Corrections have been made to Dec. 31, 1941.



NEITHER TORRENTIAL RAINS nor poor roads halted the southward roll of German panzer units through Greece in April 1941

3. Forces.—German forces have been estimated as follows from various British reports covering the operations:

	Approximately
Parachute division	5,000
Air infantry troops	5,500
Mountain division	5,000
	15,500

An over-all estimate of the German strength indicates a grand total of approximately 18,000. The equipment of these forces is reported to have included light artillery and some motorcycle transportation. Reports of operations by German light tanks were not confirmed. It is likely that the Germans employed commandeered transportation secured after making successful landings. The outstanding characteristic of the German forces was the number of aircraft employed. Various estimates have been based upon published reports of the operations. An approximate figure indicates that the Germans used about 1,500 planes of all classes including gliders. About 50% of this total represented transports. The balance included fighters and bombers in about equal proportions. This composition of the German forces and the organization of the air equipment represented an advantage over the British defense organization and equipment.

The British reports of the operations indicate that the original garrison was approximately one brigade of around 3,500. In addition, there were

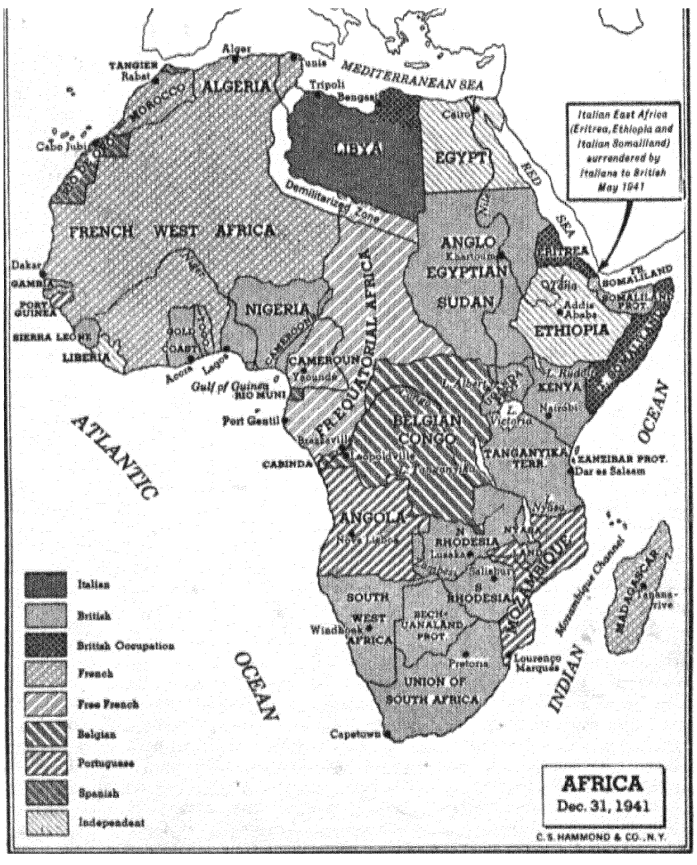
some Greek detachments of smaller size. Following the evacuation of Allied forces from Greece, large numbers were added to the original garrison. These troops included the Australian, New Zealand, British and Greek forces which had been engaged in that campaign and some marine and naval units which had successfully evacuated these troops. From various sources the size of the defense forces at the opening of the Crete campaign are estimated as follows:

British forces, including New Zealand, Australian and marine troops	23,000
Colonial troops, including Crete and near east	4,000
Greek forces	10,000
Approximate total	37,000

It must be remembered in any consideration of this estimate that these forces did not represent organized combat troops. The total does represent components of all classes, the bulk of forces recently arrived from participation in the Balkan campaign, and all hastily organized into position defenses along the north coast. In equipment these forces were sadly lacking essential items required for defense. Heavy artillery, tanks, transportation, barbed wire, tools for hasty fortifications, harbour defense installations, all were limited in amount. The outstanding contrast between the British forces in Crete and the German forces was the size of the air forces. No authorized statement of totals was available but from reliable sources it is believed that the British had less than 50 planes in Crete during the operations. Some of these planes had been in the Balkan campaign, some were stationed in Crete and a few were reported to have operated from British airfields in Egypt. Reports of operations clearly indicate great inferiority in air forces. Naval forces were superior in strength to German and Italian naval units. Reports indicate that during operations, the British fleet lost six vessels and suffered damage to several more naval units. No totals were given, but in effect the relative naval strengths of the opponents show far greater superiority for the British.

Operations: The initial phases of the German operations included the concentration of German men and matériel at selected sites along the Greek coast, and on Italian-controlled bases. Bomber and fighter planes were assembled at Greek airfields at Menеidi, Eleusis, Argos, Attica, the Peloponnesus, Italian Rhodes and the Aegean islands. The actual full-scale combat operations were preceded by extensive air reconnaissance and two or three days of heavy bombing against Crete anti-aircraft defenses. The result of this initial phase was that the Germans established air superiority, discovered the size of resistance in Crete, and reduced naval resistance in Suda bay. The actual objectives on the island of Crete were the airfields in Maleme, Retimo and Herakleion. In addition to these objectives, the marine base at Suda bay was another important target.

The German landing attack was reported as beginning early in the morning on May 20, 1941. The actual landing of parachute troops was preceded by several hours of intensive air bombing attack and machine-gun attack by low-flying planes. These attacks succeeded in forcing defenders inside defensive positions and opened the way for parachute landings. About 2,000 parachute troops were dropped near airfields in the vicinity of Maleme. In addition to parachute troops, air-borne infantry was landed from towed gliders. These gliders, carrying 12 men each, were towed by transport planes. Each transport plane towed two or sometimes three loaded gliders. Gliders were landed on level stretches of ground along beaches or near airport sites. They were reported to be about 50 ft. in length with a wing span of 80 ft. It appears that none was equipped with a motor although there were reports of outboard motors for use after making landings in harbours. Armament consisted of one machine gun mounted on the wing. All men carried in the glider landed with full equipment, and small infantry supporting weapons (light mortars, machine guns) were carried with them.



Parachute troops appeared to follow the normal procedure observed in other German actions of this type. Personnel and supplies were dropped in chutes of varying colours. The release of parachutes was begun close to the ground, reported heights averaged about 300 ft. Casualties were reported to be heavy when landings were attempted close to defensive positions. Other landings, more distant from prepared defenses, were more successful. By morning of the first day, the parachute and glider troops had landed and succeeded in capturing the Maleme airfield. The result of this success was that larger forces were landed by transport planes on the captured airport. Thus the first objective, capture of a landing site, had been accomplished in daylight hours. Late in the afternoon of the first day (May 20) additional parachute landings were made near airfields in the vicinity of Retimo and Herakleion. Estimates indicate that about 4,000 such troops were dropped in these actions. These operations were not successful and British defenses succeeded in retaining the airfield objectives. The principal result of the German action here was that without actually capturing air landing sites, the German forces prevented British troops from moving to the east to the aid of the garrison at Maleme. Later German action of ground forces moving eastward from Suda bay resulted in the loss of Retimo and Herakleion by the British.

On May 21 and 22, continued German action at Maleme succeeded in driving the British to prepared positions near Galatas. Overhead, both day and night, the air combat forces continued relentless bombing attacks on known defenses. Meanwhile the parachute forces discovered and notified air forces of the location of other land and air defenses. Superiority in the air and the capture of the air landing site permitted the landing of mountain division forces. The objective was to clean up British defenses in the western part of the island and then drive to the east in the direction of Suda bay. Reports on these air landings indicated that motorcycle detachments were included in the air-borne troops and also that light anti-aircraft and anti-tank batteries were landed at this time. All German operations were successful, the western end of the island was cleared of opposition and preparations were made to begin a strong offensive from the Maleme area to the east in the direction of Suda bay.

On May 23 and May 24, German operations began along the western coast against the British fleet. The objective of the British fleet was to prevent naval landings by the Germans. The results of the German and Italian attempts to land by water-borne transport were disastrous. No official figures are available, but the British reported success in preventing the landings and achieved the principal objective of the British fleet. It followed, of course, that the British fleet had taken a decided risk by exposing naval units without adequate air protection to attack by superior German air forces. The result of the inevitable German-British air-naval engagement was disastrous for the British. Six naval vessels were admitted to have been lost and a great percentage of the British fleet engaged in these operations was severely damaged. The decision was finally reached that the naval forces could not continue to operate against the superior air force, and the fleet was withdrawn on May 23.

These air and naval operations permitted the Germans to continue land operations against defense forces unable to secure naval or air combat assistance. Meanwhile, German action alone had resulted in the destruction of nearly all the British air forces available. Another decision to withdraw was made, and the few remaining British planes were ordered to return to Egyptian bases. Complete isolation resulted for the besieged British forces in Crete. On May 27, Canea fell. On the same day a small Italian force, estimated as a regiment, landed by boat at Sitia in the eastern end of the island. The next day this force began to move in the direction of Herakleion. All the British defense was now at the mercy of superior forces. Around Canea, the British began to withdraw to the south coast to effect an evacuation from Sphakia. German forces pushed to the east to Suda bay, and to Retimo. Junction was made at Retimo, and later at Herakleion, with the parachute forces landed in these areas earlier. Pursuit of the British forces continued to the south, and considerable fighting took place in the mountains north of Sphakia. The main British forces succeeded in retreating from the island, although air attacks on naval units resulted in the loss of several transports. By June 1, 1941, the loss of Crete was conceded, and German and Italian forces continued to consolidate gains and mop up the remaining isolated and weak resistance on the island.

Summary: German losses reported by the government admit a total of 5,893. British forces lost 12,920 while successfully evacuating 14,580. Germany claimed over 12,000 British prisoners. The brief operations secured for Germany all of the objectives of the campaign. A land base had been secured in the Mediterranean for operations against the British fleet and in North Africa. The oil fields of the Balkans were made more secure against Allied air attacks, and axis shipping from the Black sea to the Adriatic was less vulnerable to both air and naval attack. Turkey was forced to reconsider political action in relation to the axis, and Germany had secured a potential base of operations for future military action in the near east. In the tactical field, Germany had attempted and succeeded in organizing and launching the first all-air-controlled invasion of a land base defended by superior land and naval forces.

The British had lost a valuable position in the Mediterranean, from which her fleet and land bases in Egypt were vulnerable to attack. British air forces were denied desirable sites for air attack against axis-controlled shipping. Political prestige was lost, insofar as the near east and Turkey were concerned.

The air invasion consisted principally of air-borne ground forces prepared to fight on land, with the co-ordination of air support. Most important was the element of surprise, both as to the time of attack and the method employed. A military analysis cannot fail to emphasize that a paramount lesson of this campaign was the German organization of a task force equipped with adequate means to accomplish a specific job, all forces within it being under a single responsible commander.

C. East Africa.—The campaign in East Africa involved the British empire forces and the Italian armies. The scene of the operations included

BRITISH TROOPS charging through a smoke screen during the second Libyan campaign, which began Nov. 18, 1941

Eritrea, British Somaliland, French Somaliland, Italian Somaliland, Ethiopia, the Anglo-Egyptian Sudan and Kenya Colony.

1. Objectives: For the British, the principal objective in this campaign was the elimination of the Italian armies in East Africa. Other objectives included the protection of the Suez canal, the recapture of British Somaliland, the invasion and capture of Eritrea and Italian Somaliland, the restoration of Ethiopia, and the control of French Somaliland. The realization of these objectives would in turn present additional objectives which concerned the release of empire forces for duty in the northern African theatre and on other fronts. The Italian objective was to retain control of all Italian possessions in East Africa and to adopt an offensive against the British, wherever and whenever the situation would permit. A desirable objective for offensive action was the Suez canal.

2. Plans: The result of the operations indicated that the general plan adopted by the British was to cut off the western area of Eritrea, cut off the southern area of Italian Somaliland, then converge forces within Ethiopia, find the main opposition and destroy it.

The Italian general plan included the defense in strength of positions in Eritrea, principally in the vicinity of Cheren, combined with defense along the Juba river in Italian Somaliland, the protection of the railroad from Addis Ababa to the coast and the defense of the capital, if that became necessary. Apparently no Italian naval action could be planned. It also appears that no definite plan of operations was made for the resumption of offensive action outside of the area under Italian control.

3. Forces: The British forces included large numbers of Indian troops, described as Moslems, in addition to colonial forces from Egypt, the Anglo-Egyptian Sudan and Kenya Colony. Some Australian, New Zealand and South African forces participated; and in addition to British ground and air forces, units of the royal air force and the British fleet took part in operations. No reports were available as to the total number of all forces. It appears that the British were superior in numbers to the Italians in Eritrea, and it is estimated that the total of British strength was approximately 40,000. In other theatres, principally in the Kenya, Italian Somaliland and southern Ethiopian operations, the British forces were smaller and an estimate of total strength approximated 30,000. Equipment appears to have been excellent. Motor transportation operating in rugged terrain had to be in good condition, and a considerable quantity had to be available for replacement of losses. Mountain artillery was employed, and some motorized guns and weapon carriers, as well as armoured scout-car units were used. Air action for observation and bombing was reasonably superior to the Italian.

Italian forces in all operations varied in strength depending upon the location of the action. In the north, in Eritrea, it is estimated that Italian strength did not exceed 35,000 of all arms. In Ethiopia larger forces of approximately 50,000 were known to be engaged. Outpost garrisons near Lake Tana, west of Addis Ababa, and near the Kenya border were estimated at 15,000 total. In Italian Somaliland, reports indicate that about 10,000 organized troops were engaged in defense. An estimate of total Italian strength indicates approximately 110,000 total, although it is believed that not all forces took part in the operations. A considerable percentage of Italian strength was represented by the native Ethiopian forces. Some 30,000 to 40,000 of these had been organized and trained by the Italians. These are considered as additional forces to the estimated total for Italian troops. Equipment appeared to be excellent in artillery and in motor transportation. During operations no replacements could be secured, and both supplies and equipment suffered as a result. Large numbers of captured weapons indicated that old equipment had been put into use and that the modern equipment had been lost or worn out. Some Italian air forces operated, but no information was available on the condition of equipment used or the numbers involved.

Operations: During the last week of January, 1941, British forces operating out of Kassala in the Anglo-Egyptian Sudan invaded Eritrea and advanced to the town of Biscia, at the western end of the railroad leading to Massawa on the seacoast. Italian defense lines were outflanked and the British captured the railway terminus. This invasion was combined with simultaneous patrol action from several points along the Anglo-Egyptian Sudan frontier into Ethiopia. Patrol action also was begun from Kenya Colony into Ethiopia and Italian Somaliland. During the first week in February, the British forces in the north advanced from Biscia to Agordat, an important city at the junction of the Addis Ababa highway with the railroad to the seaport of Massawa. The Italian defense was light and after a short engagement, the main forces retreated into the mountains and the British captured the town. About 1,500 prisoners were taken and some animals. It became apparent at this time that the British plan to use native Indian troops had been wise. The Indian forces fought well against the Italians and it appeared that their advance was welcomed by the natives. Meanwhile in the south a small force from Kenya embarked in small schooners and motor boats and made a successful naval attack against Ras Chiamboni on the coast of Italian Somaliland. Some Nigerian troops were reported in this action. Border raids continued on all fronts. Late in February, the action in the north had continued and the British had besieged a large Italian force in the city of Cheren. The British plan to cut off Eritrea was dependent upon the capture of this important centre. Elaborate plans were made to surround the defenses, and a stiff engagement was anticipated. In the south, South African troops pushed along the coastal roads in Italian Somaliland and captured Chisimaio on the Indian ocean. In this operation, small naval units, including air forces, lent assistance. The result of this operation gave these forces an opportunity to prepare for further action against the capital, Mogadishu. Before the end of the month, a crossing had been made over the Juba river and the road to the capital was open to the invaders. After two days of extended marching, the British forces reached and captured Mogadishu and Italian Somaliland was lost to Italy. The British claimed about 9,000 prisoners. Small forces secured the capital and columns were sent to the north to join other forces invading Ethiopia from the southeast. The result of these operations realized one of the British objectives, the separation of the southern Italian colony from Ethiopia. Considerable satisfaction was evident because of the fact that British Somaliland, still in Italian control, was less than half the size of the most recent British capture of Italian Somaliland.

During the first three weeks of March, invading British columns from Kenya joined forces with British troops operating north from Dòlo in Italian Somaliland and captured Neghelli in southern Ethiopia. These columns prepared to move to the north against the capital, Addis Ababa. Larger British forces which had invaded Ethiopia from Italian Somaliland succeeded in reaching Jijiga about 50 mi. east of Harar. This operation opened the way to attack against the important capital-to-the-sea railroad which joins the highway running north from Harar. In the north Cheren still held out against strong British pressure. It became evident that ground forces alone could not succeed against stubborn Italian defenses. Plans were made to secure co-operation from the royal air force. In the Gulf of Aden, British naval units succeeded in attacking and recapturing the capital of British Somaliland, Berbera. While the main area of this colony was still under Italian control this action assisted ground forces operating in Ethiopia by keeping Italian troops engaged to the east.

In the last week of March the city of Cheren in Eritrea fell. The British plan to secure air co-operation had proved to be successful. The air operations broke the defense strength of the Italians and ground forces were able to move forward and capture the city. It was estimated that 30,000 Italians had been engaged in this operation. The bulk of the main forces retreated to the vicinity of the capital, Asmara, and to the south into Ethiopia. The British continued to advance with the object of completing the operation and securing control over all of Eritrea. Naval forces moved in closer from the Red sea and tightened the blockade around Massawa on the coast. In Ethiopia, the city of Harar fell on the same day Cheren was captured in the north. Italian resistance at Marda pass near Harar had been light and the British forces moved rapidly to Diredawa on the railroad. The capture of Diredawa broke the rail connection between the capital and the coast, and forced the Italian troops to move to the west toward Addis Ababa.

Early in April, the main Italian resistance collapsed on all fronts. In the north the British captured Asmara and occupied the port of Massawa. The control of Eritrea was completed and large British forces had invaded Ethiopia, moving south through Aduwa. The capture of Aduwa, scene of the Italian debacle in 1896, was accomplished by British forces, hurrying to complete the operations to the south around Addis Ababa. British forces moving west from Diredawa along the railroad had met little resistance at the Awash river and without any serious resistance took the capital, Addis Ababa. These forces had advanced rapidly and reports

indicate that the movement was made at the rate of 25 mi. per day. The bulk of the main Italian forces retreated to the mountains. The Italian commander, the duke of Aosta, with a force of about 40,000, including some 30,000 native Ethiopian troops, took up a defensive position near Amba-Alagi. Peace terms were offered by the British but were refused and the converging British forces joined at Addis Ababa and completed the main operations. The principal objectives of the campaign had been accomplished and complete control was won when the remaining Italian forces surrendered during the second week of May.

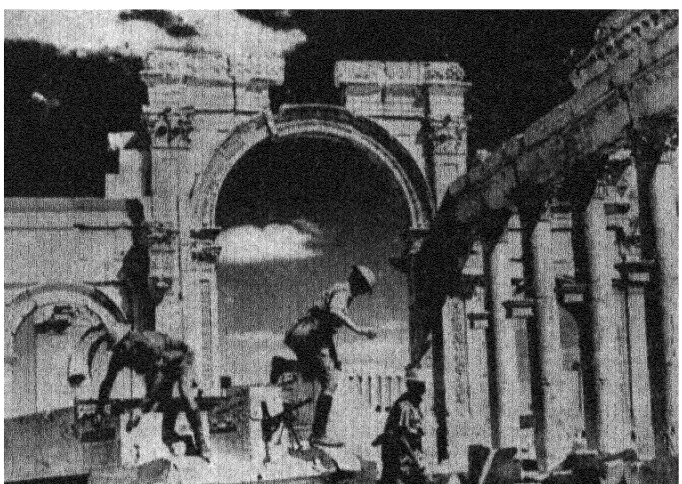
Summary: The successful conclusion of the East African campaign resulted in considerable gains for the Allies. The principal objective, the elimination of the main Italian armies in East Africa, had been accomplished. Eritrea, Ethiopia and Italian Somaliland had been won from Italy. British Somaliland had been recaptured. Along the Red sea, the Gulf of Aden and the East African coast Britain had secured the ports of Massawa, Berbera and Mogadishu and controlled the port at Jibuti in French Somaliland. The Suez canal was secured from southern attack. The British naval operations from the Indian ocean to the Suez were rendered secure from Italian attack. Large British forces in Kenya and the Anglo-Egyptian Sudan could be released for duty in other theatres. A considerable number of prisoners had been taken and some useful supplies of ammunition, guns and other weapons secured. Politically, the British gained considerable prestige and the return of the emperor, Haile Selassie, to the control of Ethiopia, augured well for the future. British naval and air units had managed to get and give co-ordinated aid when and where needed. Although unity of command had not been tried, the results had been satisfactory and the operations successful.

On the Italian side the results had been disastrous. Large forces had been captured and considerable supplies destroyed or lost. The colonies had passed out of Italian control and practically all Italian identity in East Africa seemed to disappear. The success won by Italian arms against Ethiopia and the dream of African empire appeared to vanish with the defeats suffered at the hands of the Allies. The axis cause had lost a valuable area of operations and now faced Allied forces in Africa, refreshed by victory and strengthened by the release of forces from East Africa.

D. The North African Campaign: (a) First Phase—British (*Jan. 1-March 31, 1941*).—The nations engaged in the North African campaign during these months included Italy, Britain and Germany. In addition to the British force from England, other Allied forces included Moslem Indian troops, New Zealand and Australian forces, and the native and colonial troops from French Equatorial Africa, under control of the Free French government. The action during the first three months was confined principally to the Egyptian and Libyan coastal area and the operations were mainly the result of air and ground forces, assisted by some naval activity along the Mediterranean shores.

1. Objectives: The British objective was to drive the Italian forces out of western Egypt, to continue the attack to the west along the Libyan coast, and to destroy the Italian Libyan army. Secondary objectives included the capture of additional port facilities for the British Mediterranean fleet, the extension of British air bases in northern Africa for use against axis naval supply lines and against the Italian mainland, the removal of any threat by Italian forces to the British forces in the Anglo-Egyptian Sudan, and the union of British and Free French forces operating from the Lake Chad area in French Equatorial Africa. Aside from these military and territorial objectives the British also sought to secure the left flank of their land forces along the northern African coast and thus establish security for the Suez. The British initiated operations in North Africa in Dec. 1940. These activities continued through the early months of 1941.

The Italian objective appeared to be the logical assumption of the defense of all gains made within the Egyptian area, plus the defense of the colony of Libya, and maintenance of the effective strength of the Italian Libyan army. Secondary objectives appeared to include the resumption of the offensive against the weaker British forces whenever opportunity permitted, and the opportunity for hardening the newly acquired increased manpower of the Italian army. Italian success would strengthen the home front support of the Italian efforts in North Africa, hearten the Italian forces engaged in Ethiopia, establish increased prestige for the Italian forces in the view of the nazi military leaders and in the eyes of the native populations of Africa and the near east. The principal objective of defense was of course paramount, but the possibilities of success offered the secondary objectives as rewards.



BRITISH TROOPS scouting the ancient ruins of Palmyra during the Syrian campaign of June–July 1941

General military comment on the individual objectives of the opposing forces appears to agree that the British high command had initiated the early action beginning in Dec. 1940 with a vision of testing the strength of the Italian defenses near Sidi Barrani in Egypt. The rapid disintegration of these forces in the face of the first British attacks suggested the prompt assumption of a full-scale offensive.

2. Plans: The British plan of operations appears to have been a straightforward advance to discover the principal Italian opposition followed by a rapid "pincer" or encircling manoeuvre and the swift destruction of the enemy forces. The plans included the co-ordinated action of all arms in the air and on the ground, combined with naval action from coastal waters by units of the British Mediterranean fleet. Considerable attention had been given to Italian defensive works, and elaborate plans existed for the siege and reduction of any extensive defensive positions.

The Italian plans do not appear to have been either well prepared, or if prepared, followed in sufficient detail to warrant extensive examination. Plans for the preparation of defensive works appear to have been elaborate and well executed insofar as the actual locating and construction of works were concerned. No general plan for wide-scale defensive operations along the whole Italian position appears to have existed.

3. Forces: In Dec. 1940, it was estimated that the Italian forces in North Africa numbered close to 250,000. In addition, the Italian army had a minimum of 300–350 planes. Armoured forces included both medium and light tanks, while other mechanized equipment included light-weapons carriers. All arms were represented and the bulk of the combat ground forces were reported to be light and heavy artillery, with anti-aircraft, some anti-tank defenses and considerable ground infantry divisions with extensive motor transportation. It is estimated that only small Italian naval forces were considered available for operations along the coastal waters of the Mediterranean during this part of the North African campaign.

British forces, consisting of Australian and New Zealand troops, Indian troops and British colonial forces, numbered approximately 100,000. No official figures indicate the total planes available but it is calculated that not more than 100 planes were later reported in action during the campaign. These forces were not supplied with modern equipment and while not considered numerically a match for the larger Italian forces, were fully capable of launching an initial attack of great strength against advance Italian positions in Egypt. Adequate service troops were available to maintain engineer and water-supply needs. In the Mediterranean, the British fleet was well prepared to offer protection along the coast against naval attack, to assist in the protection of reserves advancing along the coastal highway, and to join in surface and air supporting action co-ordinated with ground operations.

Operations: The early part of the complete British operation began in December when initial offensives resulted in easy victories and the capture of Matruh and Sidi Barrani. On Jan. 3, 1941 the British launched the first attack of the new year against the Italian stronghold at Bardia. This Italian defensive position was estimated as a formidable obstacle to attack. It was estimated that about 45,000 Italian troops were engaged in active defensive preparations. Outside the stronghold more than 50 strong points had been constructed along a 17-mi. semicircle. Concrete tank traps had been built, carefully laid barbed-wire entanglements had been built, and large numbers of guns of all calibres had been placed in tactical defense positions. Within gaps, extensive land mines crossed likely areas of tank approach to the main positions. The operation began with severe British air attacks ranging as far to the west as Castel Benito and Tripoli. The Australians began land operations by making an initial feint attack 4 mi. south of the city and then launched a principal attack from the southwest. Immediately on breaching the outer circle, the attacking troops swept to the right and left and attacked the remaining positions from the flank and from the rear. On the first day, British reports claimed 5,000 prisoners. During the first night, naval vessels moved into coastal waters and subjected the Italian defenses to severe naval bombardment. At dawn, these vessels moved to the west of the town and from close-in positions bombed the highways and routes of possible retreat available to the Italian garrison. On Jan. 4, the second day, a fresh land attack was launched by the British from positions north of the city and by nightfall an additional 3,000 prisoners had been taken and no real obstacle stood in the way before the attacking troops. At sunset, the Italian flag was lowered and by 1.30 P.M. on Jan. 5, 1941 the Italian forces in Bardia surrendered.

Summary: In 2½ days British forces had advanced from Matruh and Sidi Barrani, launched an attack against a formidable defensive position, defeated a superior Italian garrison, and captured the city of Bardia. About 40,000 prisoners had been taken in the early campaigns east of Bardia. About 45,000 more were added at Bardia to the growing list of Italians in British hands. The Italian forces had apparently underestimated the full strength of the British attack and when this was realized, only a partial defense of Bardia had been made.

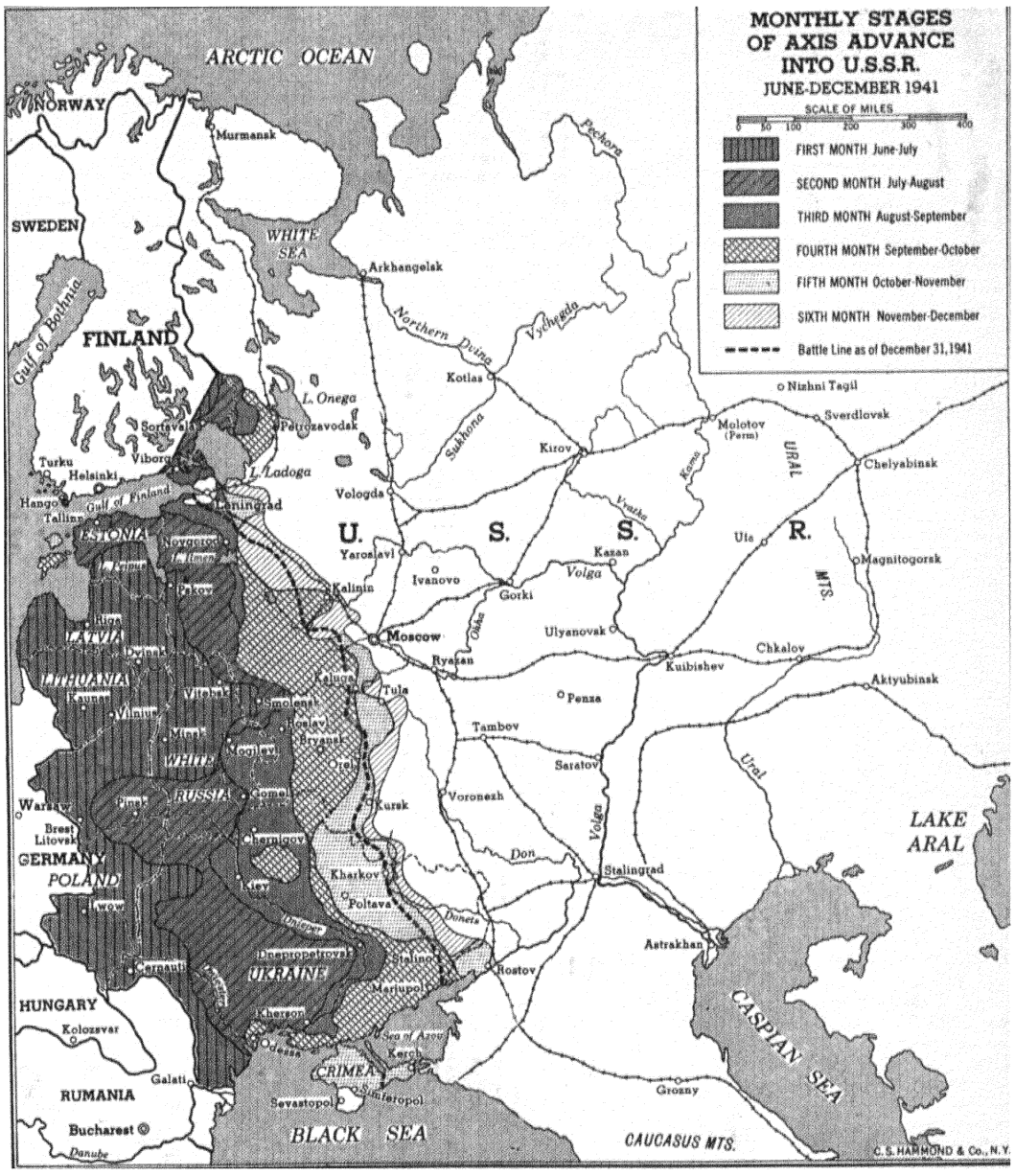
The final Italian action appears to have been an attempt to cover the withdrawal of forces to the west in the direction of Tobruk, coupled with some attempts to destroy stores and to delay early British pursuit.

(*a*) *Tobruk:* The next British objective was the defended Italian position at Tobruk, about 70 mi. west of Bardia. Ground operations began with prompt organization and dispatch of columns west and south from Bardia to take up encircling positions around the city of Tobruk. Overhead the air forces undertook the bombardment of Gazala, Derna, Tobruk, and Tripoli on the African coastline, while long-range bombing missions were carried out against Taranto, Palermo and Naples. The objectives were twofold: first to reduce Italian counterattacks by air and to weaken ground defenses, and second, to harass supply points and to delay waterborne transportation from Italy to the armies in Libya. British naval units meanwhile had moved to the west and continued to bomb coastal roads leading to Tobruk and to engage Italian naval units engaged in protecting

supply routes.

For a period of about two weeks the British forces continued to move into advanced positions, preparing for the final assault. Ground forces took up positions all around the outer defenses of the city. Meanwhile some advance units slipped by the position and reached Bomba, 60 mi. to the west of the city. Overhead the air forces continued to carry out bombing missions, while the fleet stood by to render co-ordinated support. The main British forces were massed east of the town to launch the principal attack. As at Bardia, the attack on Tobruk opened with a feint assault, followed by a principal assault. This time the feint attack was delivered from the east where the British had taken up positions near the seacoast. The principal attack was launched from positions near the Bardia-Tobruk road at dawn. The attack was successful, and several gaps were opened in the outer circle of fortified defenses. Troops poured through these openings and turned at once to roll up the flanks and capture several additional positions from the rear. The same process was repeated against the inner circle of fortified positions. By sunset on the day of the attack, an advance of 8 mi. had been made and British forces had penetrated at all points and occupied the high ground overlooking the city. Overhead since dawn the combat aviation had co-operated with the ground forces. Planes were destroyed on the ground in attacks upon Italian air bases at El Adem, El Gubbi and El Gazala. Other air attacks were made at Benina near Bengasi. Naval craft in the harbour at Bengasi were attacked from the air. The British reported that Italian air bases as far west as Derna appeared to have been abandoned. The combined British efforts resulted in the fall of the city of Tobruk within 24 hours.

Summary: About 25,000 prisoners were added at Tobruk to the large numbers of the Italian Libyan army already captured. The result of the British victory added a third large Italian base and port along the African coast for future British use.



(*b*) *Derna:* This Italian position some miles west of Tobruk was not a heavily fortified city. No rigid defense lines had been constructed similar to those which had characterized the defenses at Bardia and at Tobruk. However, the terrain at Derna afforded excellent advantages to the defender and made the position very difficult for any attacking force. It is estimated that the Italian garrison consisted of about 10,000 troops with air forces and with mechanized columns and considerable artillery. The main Italian decision appeared to depend upon a choice of making a defense at Derna, where the Gebelel Achdar mountains rendered the position difficult to assault, or to withdraw without delay to Bengasi. Defense at Derna might result in a British drive across the Cyrenaica peninsula toward Bengasi, 250 mi. to the west, leaving the forces at Derna cut off. Any retreat from Derna to Bengasi, followed by a defense at Bengasi, posed the difficult problem of successful withdrawal over 500 mi. to Tripoli if the defenses at Bengasi fell to the British.

The British expected that the town of Derna would be deserted. Reports indicate that the British plan was to continue the westward push and that the Derna action was to be a secondary assignment to a small force. In fact, Derna was well defended. To the natural defenses around the town, the Italian force of 10,000 had added considerable artillery and were well equipped with tanks and small air support. The battle was short but intense. British forces, which were increased in numbers as the full extent of the Italian resistance became known, found considerable difficulty in capturing the main entrances to the city. Italian air forces were active. Italian tanks fought stubbornly. The defensive artillery was severe. Despite these handicaps, superior British forces succeeded and overran the Italian positions. On Jan. 30, the last defenses were silenced and the town was captured. A few thousand prisoners were added to the already staggering total in British hands. The balance of the Italian garrison withdrew in the direction of Bengasi.

(*c*) *Bengasi:* British forces quickly consolidated the position in the town of Derna and the British columns resumed the push toward Bengasi. The British plan of operations included the concentration of forces for the main pressure from the east, combined with a pincer movement from the south. The southern force moved to the vicinity of Soluch and southwest of Bengasi. It succeeded in cutting the Bengasi-Tripoli highway and then took up a position in readiness. Meanwhile the main forces concentrated for the drive from the east, opened operations with a heavy attack. The plan worked, and without meeting serious resistance the British managed to capture the town. On Feb. 9, 1941, the British reported, "Bengasi is in our hands." The action had included the pursuit of Italian forces from Derna to Barce, eastern terminus of the rail line to Bengasi. Italian forces had reached Bengasi over this line, but in insufficient time to organize and defend the town against the main British attack from the east. Retreating Italian forces from Bengasi met heavy resistance from the British pincer column moving up from the south and west. About 20,000 prisoners were taken. After the fall of Bengasi small British forces continued the drive as far as El-Agheila, a distance of 170 mi., and more than half way to Sirte on the road to Tripoli.

Meanwhile, in the southern Libya area, Free French forces had assembled secretly and joined small British forces. These units had overrun the axis refueling centre for planes at Cufra and captured the axis outpost and airport at Murzuk. Other raiding parties moved north from the airport along the Algerian frontier. Later reports claimed the capture of Ghadames about 300 mi. southwest of Tripoli and along a principal highway.

Summary: In two months since the campaign had opened on Dec. 9, 1940, the British had overrun the axis forces in Libya. Matruh fell on Dec. 9, 1940, and Sidi Barrani on Dec. 11, 1940. In 1941 the British, continuing the same operations, captured Bardia on Jan. 5, Tobruk on Jan. 21, Derna on Jan. 30 and Bengasi on Feb. 9. Over 100,000 prisoners had been taken and a considerable number of weapons of all classes. Large amounts of other supplies, including transportation, had been secured. The British plan of operations had been simple and effective. It could be summed up in one word—pursuit. The objective, the defeat of the Italian army in Libya, appeared to be realized, although despite losses the Italians still had large forces near Tripoli.

The results of the successful British operations indicated several gains for the Allied position in North Africa. The Suez canal had been temporarily insured from a large ground attack from the west. New naval bases had been secured along the Libyan coast and new air bases were now available for attacks against Italian ground forces as well as joint naval and air operations against axis naval units. The principal tactical development appeared to be the development of unified command within

the British forces. All operations on land and the bulk of air and naval assistance appeared to be under the control of a single commander. Where more than one commander was concerned, a high degree of co-ordination was evident. The completion of this early action in North Africa increased the prestige of the British forces and resulted in prompt need for reorganization and support for the Italian armies in Africa.

(b) **Second Phase—Axis** (*March 30-April 30, 1941*).—The same nations engaged in the first British campaign in North Africa were engaged in the second campaign. Germany played a small role in the early campaign but assumed command of axis operations during the second campaign.

1. **Objectives:** The principal axis objective was to regain the ground lost during the first British campaign and secure a favourable area for future operations to the east.

The British objective appeared to be wholly defensive: the protection of gains already made and the protection of the west flank of the Suez.

2. **Plans:** The axis plan appeared to be the concentration of mechanized forces including armoured scout cars, motorcycle troops, reduced size panzer or armoured forces, with tanks and motorized infantry. These ground forces were supported by adequate combat aviation. Following the transportation to and concentration of these forces in the theatre of operations, the plan included a rapid advance to the east to overrun the British garrison. It appeared that the axis plan was to avoid moving forces along the coastal areas where they would be subject to British naval attacks. The full extent of the proposed operations is not known. The results of the action indicate that the plan contemplated a drive across the Egyptian-Libyan frontier and the occupation of new defensive positions there as a base for future operations to the east. All plans included unity of command and continuous co-ordination of all air and ground forces. The British plans included a stubborn defense of all areas gained in the first British campaign. Reduced forces were to defend fortified positions, with naval assistance from coastal waters and such air assistance as was available. The extent of the plan appeared to include increase in existing forces by the addition of units released from operations in Ethiopia, and the prompt creation of a strong defensive position immediately within or along the Egyptian-Libyan frontier. In all cases, the British plan was to protect the west flank of the Suez canal. Apparently the plan did not include unified command of all forces available for operations.

3. **Forces:** Various estimates were made of the size of the German and Italian forces engaged in the campaign. Early estimates indicated German strength at 20,000 including small Italian forces. In addition, an estimated reserve of an equal number was reported in the vicinity of Tripoli. No final figures were available but it appeared unlikely that the combined axis forces, exclusive of reserves, numbered more than 25,000 during actual operations. British forces were far inferior in numbers to the axis forces. The commanding general in Africa at a later date attributed axis gains to the reduced numbers of the British in Libya and Egypt. Demands made upon the British for the campaign in the Balkans were announced as the reasons for the reduction of the North African forces.

Operations: The campaign opened with lightning speed when axis mechanized forces struck to the east against the most advanced British stronghold at El-Agheila. On March 24 this position fell and the axis columns pushed on to the east. On April 1, Marsa-el-Brega and Agedabia were captured, and on April 4 Bengasi was evacuated by the British and occupied by the axis forces. British reports claimed that there were no losses in completing the successful withdrawal from Bengasi. Three days later it appeared that the British plan was to withdraw to the east, perhaps to Egypt. On April 7 Derna was captured and valuable water supplies lost. On the same day an axis raiding party captured three general officers and some 2,000 retreating British forces near Mechili, about 50 mi. southwest of Derna. It was not clear at this time that the axis forces were moving on a broad front, but the extent of the raids made south of the coast jeopardized the British withdrawal. By April 8, axis forces were continuing to advance toward Tobruk and on the 9th it appeared that Tobruk was in danger. By the 13th the fortified position at Tobruk had been encircled and the British positions to the east were in difficulties. Axis columns swept beyond Tobruk and captured the post and Bardia, Ft. Capuzzo near the Libyan frontier and Sollum across the Egyptian border. It is estimated that one Australian division and one mechanized brigade, both reduced in numbers, were holding the fortified position at Tobruk. It was apparent that the British could still provision or withdraw this garrison by naval forces controlling the water route to the port. The factor of risk in regard to relative strength of air forces made the position difficult to defend. By April 15 it became apparent that the force of the axis drive had been expended, and the British forces were holding east of Sollum. British naval and air forces launched attacks against axis columns along the coast. Axis reports indicated that these attacks were repulsed. Around April 16 British reinforcements began to arrive from Ethiopia and defensive positions east of Sollum were strengthened. During the next ten days, British naval and air units attacked the axis base at Tripoli, and numerous air attacks were made along the coast. By April 22 it appeared that Germany had consolidated areas gained and adopted defensive positions west of Sollum while continuing to besiege Tobruk. On April 26 the axis forces launched a sudden raid east of Sollum and advanced as far as Bugbug. British forces withdrew in the direction of Sidi Barrani and appeared prepared to fall back to prepared positions as far to the east as Matruh. When axis forces suddenly withdrew to the west, the British counterattacked in that direction. A second axis raid met this counterattack and pushed the British some 25 mi. east of Sollum. By April 30 the situation appeared to have stabilized. The axis defensive positions were east and south of Sollum in Egypt. The British forward defenses were west and south of Sidi Barrani, with stronger defenses west and south of Matruh.

After April 30, action appeared to be confined to sporadic raids between the defensive positions and scattered air and naval action along coastal bases.

Summary: The conclusion of this campaign indicated that within two weeks axis forces had forced the British from positions gained during earlier British operations of eight weeks. The combined German and Italian forces had recaptured the ports of Bengasi, Derna and Bardia and encircled the British garrison at Tobruk. Defensive positions had been established within western Egypt and offered suitable areas for future operations to the east. In addition, considerable equipment had been captured, both British and some supplies recently lost by Italy. Axis bases in Sicily, as well as axis naval operations in the Mediterranean, were made more secure from Allied air and naval attacks. The British had suffered defeat within a brief campaign. Valuable port facilities were lost to the fleet. Air-base sites along the Libyan coast had been captured. Reduced forces in western Egypt were faced with apparently superior axis forces. In the final analysis, the west flank of the Suez appeared to be in serious danger. Some satisfaction existed in the consideration that the Tobruk garrison was still holding out and that British naval units still operated along the water routes to this port. In addition, axis naval units were obviously inferior to the British Mediterranean fleet. The British position in North Africa and in the eastern Mediterranean was in danger but still capable of strong defense.

General Sir Archibald P. Wavell (*q.v.*), British commander in North Africa, was quoted by the press in the following comment regarding these operations:

"Our conquests in Cyrenaica were left to be held by a garrison of partly trained and partly equipped troops. I made a miscalculation there.

"I didn't expect the enemy to counterattack until the end of April at the earliest, by which time I hoped to have back at least part of a seasoned Indian division from Italian East Africa and to have completed the equipment of troops left in Cyrenaica, which consisted of a British armoured brigade, an Australian division and an Indian motor brigade. All of these were short of equipment, transport and training.

"Unfortunately, the enemy attacked at least a month before I had expected it possible."

(c) **Third Phase—British** (*Nov. 18-Dec. 31, 1941*).—The nations engaged in the third North African campaign were the same as those which took part in the second campaign of March 30 to April 30, 1941. The British empire forces, consisting of troops from Great Britain, Australia, New Zealand and India, plus Free French and Polish units, faced Italian troops, strengthened by the German Afrika Korps of General Erwin Rommel (*q.v.*). The details of this campaign, which was not completed at the end of the year, will be covered only through Dec. 31, 1941.

1. **Objectives:** The immediate British objective was to destroy the axis forces in North Africa, remove the threat to the Suez canal and the near east and by securing the whole of Libya, establish new bases for further attacks against the axis in Europe. In all, the long-range objectives were essentially the same as those which guided the first British drive into Libya in Jan. 1941.

The axis objective was fundamentally one of defense—to fight a delaying action against the superior enemy forces until sufficient reinforcements arrived from Europe to allow resumption of the offensive against the British.

2. **Plans:** The British plan of action appears to have been an attempt to utilize superior numbers of troops, superior air power and an equality in mechanized equipment, to smash the enemy in a series of encircling movements and head-on tank battles. Instead of driving along the seacoast, as in the first North African campaign, the British struck in strength from several points farther south, sending out advanced mechanized columns in an effort to split the enemy forces into smaller groups for eventual destruction in frontal battles. An important part of the plan of action was the use of the royal navy to prevent any sea-borne reinforcement of the axis units and to attack axis-held ports from adjoining coastal waters. Thus, this was to be a land-sea-air offensive, with co-ordination of all three arms of the service.

The axis plan of action was to exact as heavy a toll as possible from the British personnel and mechanized equipment, and then, upon the addition of axis reinforcements, to launch a counteroffensive into western Egypt.

3. **Forces:** It was estimated that in Nov. 1941, the British forces in North Africa numbered approximately 85,000 troops. These included three armoured divisions of approximately 3,000 tanks, many of them of U.S. manufacture. The British air strength numbered not more than 150 planes at any one time.

The axis forces numbered approximately 55,000, with three reduced size panzer divisions. The axis had no naval support, and the total of axis planes engaged never numbered more than 90 to 100.

Operations: The operations in this phase of the war began on Nov. 18, 1941, when the British after long months of preparation attacked in force across the Egyptian-Libyan frontier. Contrary to expectations, the attack came from five points, well to the south of the coastal towns of Bardia and Sollum. The first of these columns curved around to invest the axis stronghold of Sidi Omar, just across the border. Another struck out southward through the desert. The main columns, however, swung north after crossing the border, in an attempt to reach the sea and trap large axis forces in Sollum, Bardia, Gambut, Fort Capuzzo and Rezegh. At the same time empire forces in Tobruk, consisting principally of Indians, Australians and Poles, launched an attack from that besieged town, with the object of smashing through the rear of the enemy lines and re-establishing contact with their own troops. The royal air force struck heavily against axis airdromes and fortifications, as well as the Italian ports of Naples, Brindisi, Messina and Tripoli; while the royal navy carried out bombardments of enemy land installations all along the Libyan coast.

The advance was rapid. On Nov. 24, 1941, the British claimed the capture of Fort Capuzzo, Bardia and Gambut. The driving empire forces pushed westward toward besieged Tobruk, and a great tank battle developed at Sidi Rezegh. The British claimed control of the air in the middle eastern theatre, and German attempts to bring in reinforcements from Europe by towed glider planes, as in the Cretan campaign, were smashed.

For three days heavy fighting continued in the Rezegh area. On Nov. 27, 1941, the British announced that contact had been made with the Tobruk garrison. The bulk of the axis forces was caught in a pocket between Rezegh, Tobruk and the sea. The only axis offensive action, a diversion raid across the Egyptian border, had in the meantime been driven back. The British capture of Gialo oasis, far to the south, was also

confirmed.

On Nov. 28, 1941, the second phase of the battle of Rezegh began. The axis forces, trapped by the thin British line between Rezegh and Tobruk, launched a strong attack in an attempt to break free. Heavy fighting continued for several days, with German reinforcements moving up to join the battle from the west. On Dec. 3, 1941, by taking Rezegh, Zaafran and Bir el Hamad, the axis forces once again assumed control of the corridor south of Tobruk. Tobruk itself was again isolated. The British were compelled to withdraw to a defense line extending from south of Rezegh to Fort Capuzzo. Bardia and Gambut were retaken by the axis, and the Sollum area remained firmly in axis hands. The initiative was with the axis during this period. The British appeared to be in the process of reorganization.

On Dec. 6, 1941, the British began the third phase of the battle of Rezegh with an attack in the vicinity of El Duda. Again the battle raged. Heavy losses in men and equipment were reported on both sides. On Dec. 10, 1941, it became evident that the British had won a victory, when the axis announced a general withdrawal of its units to the west of Tobruk. Except for scattered pockets of axis resistance, the area between Tobruk and Bardia was now under British control. Gambut and El Adem were reoccupied by the British.

Then began a systematic pursuit by the empire forces of the retreating axis units. On Dec. 11, 1941, the German high command admitted defeat in North Africa. Bardia and Sollum were still in axis hands, but they were isolated, miles behind the rapidly moving fighting front.

The axis withdrawal to the west continued, with the British maintaining contact in close pursuit. Axis losses were severe, as the retreating columns split into two bodies and fought unsuccessful rear-guard actions at Mechili and in the area southeast of Derna. On Dec. 20, 1941, Derna fell. The pursuit continued along the coast. On Dec. 25, 1941, the British took Bengasi without a fight. The main axis forces had destroyed the town and retreated to the south. British units, in the meantime, had driven across Cyrenaica and reached the Gulf of Sirte southwest of Agedabia, thus cutting off the main route of axis retreat into Tripolitania. As the year drew to its close, the main bodies of the British and axis forces were engaged in battle in the region of Agedabia. It appeared as if the British were to attain their principal objective, *i.e.* the destruction of axis military power in North Africa. The final issue, however, remained to be determined.

Summary: It is apparent that British forces had been reorganized and re-equipped to conduct open mechanized warfare in this theatre. The addition of modern mechanized and motorized equipment and other supplies received from the United States counted heavily in the British success. It must be remembered that the bulk of the German mechanized and air forces were engaged in the eastern theatre against Russia. This factor meant that the axis units in Libya could expect little reinforcement. Taking advantage of these circumstances, the British opened and conducted a skilful campaign.

E. The Near East.—The nations involved in the campaign in the near east included Vichy France, Free France, the British, Germany, Italy and Russia. In addition to these nations, the states of Palestine, Trans-Jordan, Syria, Iraq and Iran were the scenes of the operations and participated in the action.

1. Objectives: (*a*) *General.*—The British principal objectives in any military operations in this area included the denial of the area to any axis forces. This objective included the security of the east flank of the Suez canal and the whole British position in the eastern Mediterranean. Additional objectives included the control of the Vichy-dominated government and armed forces in Syria; the control of the governments in Iraq and Iran; the security of oil supplies in this area; the control of the Trans-Iranian railway from the Persian gulf to the Caspian sea; the protection of the area across the routes to the Suez and to India; the extension of political pressure toward Turkey in regard to the Allied cause; and the extension of British prestige generally in the near east.

The axis objectives were principally concerned with securing control of the governments in Syria, Iraq and Iran in order to facilitate further moves toward Suez or to the east.

Syria sought to retain its form of government operating under an agreement made between Vichy France and Germany signed in May 1941. Iraq and Iran hoped to retain independence and to maintain a neutral status in regard to the axis and the Allies. Iran particularly hoped to be free from Russian intervention. Both states resented Allied or other control of the oil and other resources within their borders.

(*b*) *Iraq:* The Iraqi government was unstable during the early months of 1941. As a result of a revolt within the state a pro-axis premier took charge of the principal government powers, including control of the armed forces. An early British agreement with Iraq permitted British forces to occupy certain sections of Iraq. The change in government leadership rendered the agreement void and increased the risk of essential German control. Despite attempts to reconcile political disagreements and reach a peaceful solution, hostilities began in May 1941.

2. Plans: The axis plan apparently included the establishment of rear bases in Greece, the Aegean sea and the Italian island of Rhodes, while establishing advance bases in Syria and if possible in Iraq. Air transportation seemed to be the principal means relied upon for all movements to the near east. Action in Iraq appeared to be a prelude to action in Syria.

The British plan included attack upon all axis bases by air from Egypt and the near east, combined with fleet action along the Syrian coast and ground action in Iraq. The Iraq action was considered a necessary preliminary to operations in Syria.

The Iraqi plan was not immediately clear. It appeared to include the defeat of British forces within the border, coupled with joint action with German forces whenever the new Iraqi government secured control over sizeable groups of Iraqi armed forces.

Operations: Axis forces established rear bases for air operations in Greece, the islands of the Aegean sea and in Italian Rhodes. Advance bases were established within Syria at Aleppo, Palmyra and Damascus. Air and naval forces mined the eastern and southern coastal waters off Cyprus. The British royal air force began operations by bombing the rear bases and the forward bases of the axis forces. Germany replied by bombing Alexandria and the Suez canal, and followed up these attacks by bombing British forces at the Iraqi airport of Habbaniya and establishing an advanced airbase in the vicinity of Mosul. The British had already sent forces from Libya and Egypt to Palestine and Trans-Jordan. A large British column was formed and Iraq was invaded in the direction of Habbaniya. At this airport British forces, already in possession by virtue of the earlier but disputed Iraq-British agreement, had been surrounded by Iraq troops and bombed by German air forces. The British column succeeded in making the relief of the besieged troops and drove the Iraqi forces eastward to Feluja. The Iraqi troops had resisted stubbornly at this point and flooded the area between the Euphrates and Tigris rivers, preventing the uninterrupted advance of the British on the city of Baghdad. Meanwhile German officers were organizing Iraqi troops for an attack on Basra in the south, while German air forces continued to hold Mosul and continued air attacks on all British forces. The British royal air force attacked motor convoys of ground forces moving from Syria in the direction of Iraq. The British fleet occupied bases at the head of the Persian gulf and moved north and attacked Basra. After three weeks of scattered air and ground action the Iraqi rebel government fled to Iran. The collapse of all Iraqi resistance followed promptly. German forces withdrew from Mosul and Basra while Iraqi troops surrendered at Baghdad. The operations closed with the British forces in complete control of all Iraq.

RUSSIAN TANK CREW photographed near the front after the soviet armies had launched their great counteroffensive against the Germans in Dec. 1941

Summary: Within three weeks British forces had succeeded in defeating a rebellious army in the neighbouring state of Iraq, denied the area to the axis powers and secured the land area and the natural resources of the country. Iraq lost complete control of her own future, at least for the duration of the war, and suffered slight but apparently unnecessary casualties.

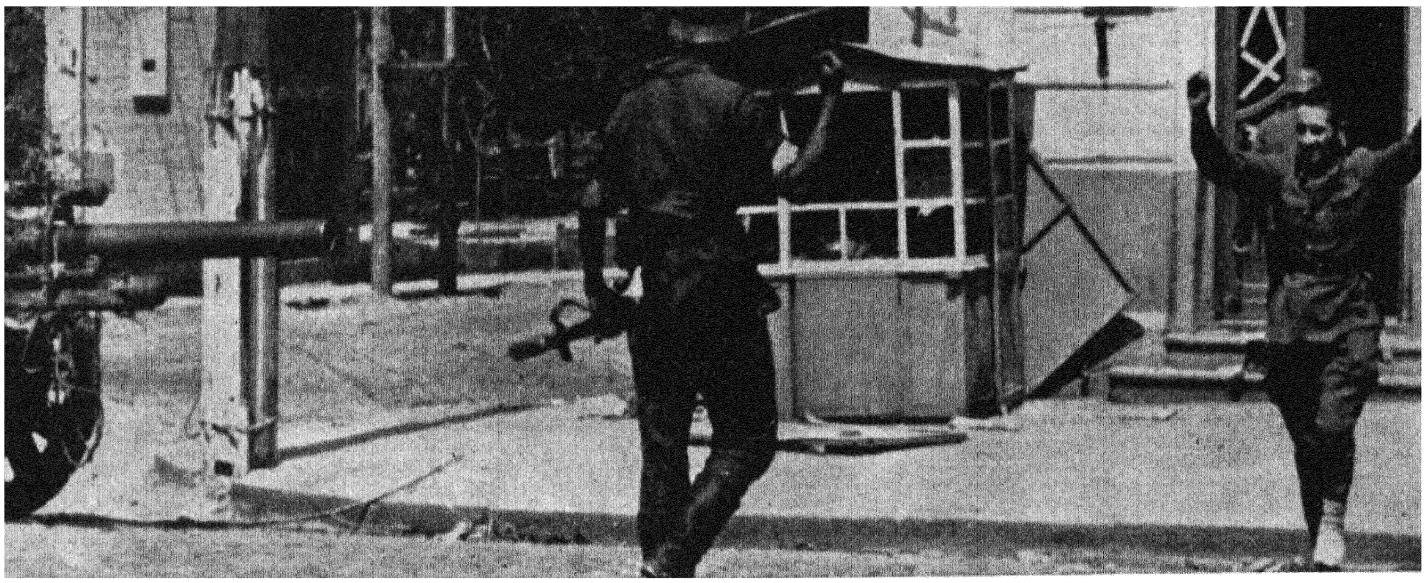
(*c*) *Syria:* The existence of axis officials in Syria, particularly those members of the armistice commission, resulted in a growing control by Germany over the Syrian government, the armed forces and the productive wealth of the state. Within the armed forces the majority appeared to favour the Vichy French government and opposed the Free French organization. Axis activities within the state established the risk to the Allied positions in the near east. Operations resulting from the military actions in Iraq led to the opening of hostilities in Syria.

The British plan of operations included a land invasion of Syria from Palestine, Trans-Jordan and Iraq. In addition, the royal air force was to attack axis air forces and French garrisons resisting the invasion. Meanwhile, the British fleet operating in the eastern Mediterranean was to be employed against the seaports to assist the land attacks.

The axis plan of operations appeared to be limited to air action plus the activities of many German nationals who were already in the country co-operating with the French army of the Levant.

British forces included Arabs, British, Scots, Anzacs, Canadians, Sikhs and Gurkha Indians and the Free French forces under General de Gaulle. The Vichy forces of the French army of the Levant included Senegalese, Annamites, Algerians, Moroccans, Lebanese and regular French troops. The total of British forces was variously estimated as three to five divisions plus native troops and Free French forces. British equipment was considered excellent and included considerable artillery, tanks, armoured vehicles and about 400 planes. Axis air forces were inferior in numbers and the number of troops appeared small and were apparently unorganized. Within the British forces, consideration had to be given to the Arabian tribal feelings in regard to the holy city of Damascus and additional consideration to the possible loss of Vichy-controlled naval units to Germany if the French army of the Levant was too severely handled. All forces were mixed and this factor affected the conduct of the operations.

Operations: On June 8, British forces invaded Syria from Palestine in the direction of Beirut on the coast, from Trans-Jordan through the mountains in the direction of Damascus and from Iraq in the direction of Deir-ez-Zor and toward Aleppo. In the southwest the columns moving north toward Beirut joined at the ancient city of Tyre. Australian forces led the attack to Sidon from Tyre and succeeded in capturing the city. Strong French resistance resulted in the recapture of Sidon, and not until the British fleet bombed French positions from coastal waters, could the British counteroffensive succeed in taking Sidon a second time. As these columns moved to the north the fleet continued to operate against French ports and against French columns moving along the coastal highways. Beirut fell



THIS RUSSIAN SNIPER smiled broadly as he surrendered to Germans in the summer of 1941, possibly because he had already picked off his quota of the enemy

after combined action by the ground forces moving north from Sidon and from the vicinity of Kisswe south of Damascus.

Farther to the east, British forces moved to the capture of the town of Kisswe and after four days of strenuous resistance captured the stronghold and moved north to besiege Damascus.

In the north, two columns separated by about 100 mi. moved simultaneously from the Iraq frontier toward the objectives of Aleppo and Palmyra. The northern column of Arabian troops continued to push toward Aleppo and toward the coastal city of Latakia. The southern column moving through Deir-ez-Zor swung to the south to capture Palmyra. Success at Latakia in the north would assist the fleet in the defense of Cyprus. Success at Palmyra would open the route to Tripoli through the city of Homs.

As the ground operations continued, the royal air force continued operations against obstacles holding up the advance. That action continued to effect necessary co-operation. It must be recorded that the limited axis intervention in these operations, the division of loyalties within the French army of the Levant, the precarious loyalties and tribal customs of some of the native forces and the mixed character of the Allied forces, all contributed to the final results of the military action. After 33 days of combat, the campaign ended on July 10 when an armistice was declared and hostilities ceased. Four days later, on Bastille Day, the formal treaties were signed.

Summary: In less than five weeks the British had succeeded in the invasion of Syria and the defeat of armed resistance within that territory. Reports indicated that the Syrian losses were about 9,000 casualties while the Allied losses totalled about 1,500. By terms of the treaty, French prisoners were released and repatriation granted to those requesting it. Of a total of about 33,000 French forces it was reported that approximately 14,000 were repatriated to France. The British secured rights to occupy Syria for the duration of the war and this permission included control of war materials and public utilities.

(*d*) *Iran:* In April 1941 the state of Iran made an agreement with Germany which permitted large numbers of German specialists to enter the country to assist in the operation of oil wells and the operation of pipe lines. This country produced an estimated 78,000,000 barrels of oil annually. Pipe lines ran to the Persian gulf and extensive oil wells were in operation near the Caspian sea and the Iraq border. Just to the west of the Iranian border pipe lines from Kirkuk in Iraq ran to Syria and Palestine. To the east are Afghanistan and Baluchistan, doorways to the British empire in India. The Trans-Iranian railroad connects the Caspian sea with the Persian gulf. To the north are Russia and Turkey. Late in August, Russia was engaged in war with Germany, and Turkey was still a doubtful neutral. German infiltration into Iran had continued despite frequent protest by the Allies. The British decided to take action and opened hostilities at the end of the month. The nations involved in this campaign included Germany, Iran, Russia and the British.

The axis objective appeared to be the maintenance and extension of growing controls over the Iran government and the natural resources of the country. The British objective was to further Allied control in the near east and deny the axis access to oil and to a position for future attack. The Iranian government apparently wanted to retain its independence, be free from both Russian and British interference and continue friendly relations with Germany.

No organized axis forces participated in the campaign. Apparently all axis action was confined to the operations of axis representatives in control of oil industries and possibly control of railroads. The Iranian army had an estimated strength of about 200,000 including reserves. Equipment was not complete and in some cases far from modern. Operations were so limited that it is doubtful if more than a few hundred men were in action. Small naval patrol boats comprised the navy.

British forces were smaller in numbers than the Iranian forces. But here again operations were limited and only small British land forces were required. British naval forces were far superior to the Iranian naval units.

The Russian forces outnumbered all other contestants. Apparently three to four divisions were assembled for operations. Air forces appeared numerous but few were actually engaged in operations.

Operations: Russian forces in the north moved south on either side of the Caspian sea. In the northwest one column captured Tabriz, as a second column moved south along the seacoast toward Pahlavi. To the east of the Caspian another column captured Bandar Shah, the northern terminus of the Trans-Iranian railroad.

On the first day of hostilities, Red bombers flew over the capital city Tehran, dropped bombs, and within a few hours orders had been issued by the Iranian government to cease firing. In the west the British invaded Iran from Iraq, captured an oil field near the border and drove toward Kermanshah. British naval forces defeated the tiny Iranian navy, sank several axis merchantmen and landed forces at Bandar Shahpur, the southern terminus of the Trans-Iranian railroad at the head of the Persian gulf. These forces moved rapidly to the north and captured oil refineries at Abadan. British forces concentrated in Baluchistan were not required for operations. Hostilities ceased within an estimated 80 hours after they began. Iranian resistance was easily overcome.

Summary: Within a few hours the Allies had established control over Iran. For the British the victory provided a controlled route for supplies to Russia and brought Russia closer to the Allied camp. German infiltration into Iran had been eliminated and the way was open to establish an Allied line south of the Caspian if the Germans crossed the Dnieper. Germany lost an opportunity to secure a base for future operations against Russia and the British and realized that axis intervention in the near east had been progressively eliminated. Iran lost her independence and faced occupation by Russian and British forces for the duration of the war.

Russia secured a valuable supply route to the south and the Persian gulf. In addition the ties were strengthened between Russia and the Allies, and an area was secured for possible resistance against the axis if operations to the north required a new defense.

Summary on Near East: The Allies, operating with mixed forces, had secured Iran, Syria and Iraq from the axis or axis-controlled governments. Large areas rich in oil, and affording valuable sources of raw materials for war, were occupied. Allied prestige was increased in the east. The route to India was secure. The Russian left flank was supported and a supply route assured to the Persian gulf. The right flank of the Suez had been secured and Britain's position in the eastern Mediterranean strengthened.

F. The Russian Campaign.—The nations involved in this campaign included Germany, Finland, Hungary, Rumania, Italy and Russia. The areas of the countries of Latvia, Lithuania, Estonia and Poland were included in the war zone. The period of time covered by this analysis of the campaign begins on June 22, 1941 and covers the six months to the end of the calendar year.

1. Objectives: The principal objective of the Germans and their allies appears to have been the elimination of the Russian armed forces. The German nation sought security in the east, to permit freedom of action to the southeast, the south, the southwest or the west. Success for Germany would result in the acquisition of the industrial areas of Russia west of the Urals, insure vast additional stores of grains and foodstuffs, open the way to the oil supplies in the near east and Russia, encompass the rich agricultural areas of the Ukraine and the Donetz basin and furnish materials for continuing the war for an indefinite period. Strategically, the elimination of the Russian forces and the occupation of large areas of Russia would result in surrounding China with axis forces both to the east and to the west. Also this success would bring the axis closer to the near east and to the road to India. It appears that Finland sought the return of the areas lost to Russia in the recently completed war. Other German allies had individual motives which looked toward the acquisition of territory lost to Russia or the gain of new territories to extend the power of the invaders. Adolf Hitler claimed that the security of the German state and of all Europe depended upon the defeat of Russia and the elimination of the threat by Russia to extend the system of Bolshevism throughout the world.

The Russian objective appears to have been the defense of the homeland. It followed that the objective included the defeat of the German and other invading forces and the eventual destruction of the nazi and axis system in Europe.

2. Plans: Terrain, geography, racial hatreds, time and the weather were considerations included within the German plans for the conduct of operations in this campaign. Germany was familiar with the terrain on which the operations would take place. The areas in Latvia, Lithuania, Estonia and Poland were areas in which both Germany and Russia had manoeuvred on former occasions. The large plains to the east; the area covered by the Pripet marshes; the river systems; the road nets leading to the north to Leningrad, to the east to Moscow, to the southeast to Rostov; the supplementary rail nets leading to these centres and to the ports in the Baltic and on the Black and Caspian seas: these were terrain features and features controlled by the terrain which were the subject of continuous examination

by the German high command. The geography of the area of the campaign found Russia far removed from outside sources of supply.

So far as the geography is concerned, the factor of great distances marked this campaign distinctly. On the initial combat front, the opposing forces faced each other along a line equal in length to the entire United States-Canadian border. On the north flank, racial hatreds smouldered within Latvia, Lithuania, Estonia and Finland, each a nation which had recently lost territory to Russia. In the south, Rumania had lost a valuable area to the Russian state. Within Russia the nucleus of a revolt existed in the disaffected group representing and supporting the Ukrainian republic. All these groups could be counted upon to fight against the Russian national objectives. The time factor demanded that the German objectives be accomplished at the earliest possible date and at the expense of the minimum effort. The weather forecast indicated that the Germans could count on approximately three months of reasonably good weather.

All these considerations undoubtedly were weighed carefully by the German high command before the opening of hostilities. It appears that the estimate made by Germany as to the duration of the campaign was a maximum of four months, with some reasonable expectations that success might be secured in three months or even less. It appears that the tactical plan was to include the familiar pattern of the "keil" and "kessel" method of attack, in which a wedge is driven into the enemy line to create a gap which allows large motorized and mechanized forces to rush through and to cut off and encircle and destroy the armed forces trapped by this operation. All operations on the ground were to be preceded by large-scale air attacks to gain air superiority over the Russians. The first objectives of the attacks were to be Leningrad on the north and the port facilities on the Baltic, Moscow in the centre, Rostov and the Ukraine in the south. The Finnish plans appear to have been a deliberate ground attack across the frontier over the areas recently lost to Russia, and the assistance to German forces to the south of Finland with the possible acquisition of control of the Russian ports on the Baltic.

The Russian plans for the campaign included a defense in depth along the frontiers facing Finland and Germany as well as Rumania in the south. This plan of defense was adopted with a view of the assumption of the offensive whenever the situation would permit. The Russian form of defense included a strong resistance around large, as well as small, centres of population. In addition, the Russians developed the plan of the destruction of supplies and the deliberate burning and blowing up of buildings and utilities whenever the German advance threatened these installations. As the campaign progressed over the first six months, the Russians in December adopted a strong offensive plan which included the pursuit of the retreating Germans and the initiation of relentless attacks whenever the opportunities were available. In all plans made by the Russian forces, the assistance of the civilian population was considered as a military factor. Russia has always classified the armed forces as the People's army, and for defense purposes has considered the civilian population available for guerrilla warfare and for siege defense.

3. Forces: The potential strength of the Russian army has been estimated as 10,000,000 men. This figure does not indicate clearly the maximum total initially available for front line use, or the final total engaged during the period covered by this analysis. Russia has considerable manpower, and under the demands of a long war could probably organize, train and equip for combat, several million men. It is not known definitely how many men were engaged at the opening of the campaign. The total was likely below 2,000,000.

As the campaign continued over several months, it is likely that the Russian forces increased in numbers, and it is possible that at the close of the year Russia had some 4,000,000 men in uniform at the front. In equipment, the Russian forces appeared to have ample supplies of moderately good types of modern design. In the air, Russian planes were not superior to the German planes but there were large numbers of these and they continued to engage in operations despite admittedly high losses. In mechanized equipment the Russians appeared to have large amounts of vehicles of all classes although it was admitted that they did not compare with the superior German types in operation. In artillery and in smaller field guns, the Russians were well equipped and most of the equipment appeared to be excellent. Small arms and supplies of ammunition appeared to be excellent. In organization the Russians were unwieldy and lacked the flexibility of modern armies in combat. After the Russian-Finnish campaign there was an attempt to reorganize the forces to approach the modern balance between artillery and infantry in the combat forces. However, in defensive warfare, the larger Russian organizations in the field were considered to have adequate strength to offer continued resistance to attack by the modern German columns. In addition, the Russian plan for active defense called for heavy counterattacks limited in extent and suited to the larger Russian type of organization. All Russian forces were well equipped to conduct protracted resistance in isolated groups against German advances. In addition, the Russian civilian population was armed in many instances and prepared to engage in guerrilla warfare.

German forces were estimated to have been around 3,000,000 at the opening of the campaign. It is very likely that these German forces outnumbered the Russians in the first few weeks of the operations. Later estimates of both forces are extremely unreliable due to the conflicting claims made by each side as to the losses suffered as the result of action. It appears that the Russians gradually increased the numbers engaged while the Germans maintained around 3,000,000 total during the first six months of combat. German equipment was considered generally superior in all respects at the opening of the campaign. In the air, Germany had the finest combat aviation seen in operation during any of the campaigns of this war. Mechanized equipment was far superior to the opponent's. Late reports had it that the German government sought clothing for men at the front, but these reports indicate a failure to plan for a long campaign rather than indicate a basic fault in the type of armament available for combat.

A comparison of forces indicates that the Russians had less than 100 divisions available along the front at the opening of the campaign. This total was probably increased to around 175–180 divisions during the first six months. Germany probably had 120 divisions at the start of operations, and the Finns, with German assistance, had another 16–20 divisions in the north. To these totals of German and allied strength must be added the size of several air fleets, and the accompanying supply and administrative services. All totals shown are subject to considerable doubt, as figures were not available to neutral observers during the early months.

Operations: The campaign opened when German forces crossed the frontier and German planes bombed Russian defenses early (3.00 A.M.) on the morning of June 22, 1941. First reports were incomplete. It appears that the operations to the close of June involved three principal areas of attack. On the north, German columns advanced through East Prussia in the direction of Vilna and Leningrad. In the centre, German columns advanced on a broad front in the direction of Bialystok, Minsk, Smolensk and Moscow. On the south, the direction of advance was toward Kiev in the Ukraine. On June 23, Brest-Litovsk was captured. In a few days, the advance along the centre resulted in a German manoeuvre which surrounded large Russian forces in the Bialystok and Minsk areas. Meanwhile German and Finnish forces crossed the Finnish frontier and launched attacks along the Karelian isthmus and in the direction of Murmansk and Kandalaksha. Smaller forces were concentrated along the frontier opposite Petrozavodsk and north of Lake Ladoga. On the Russian-Rumanian frontier, Russian forces attacked to the southwest, the German-Rumanian forces succeeded in crossing to the east bank of the Pruth river. The German attacks along the entire front were made along the familiar pattern of large-scale air attacks, followed by large mechanized attacks combined with motorized units. The German advance was rapid and the fighting around Bialystok and Minsk severe. Russian forces appeared to be offering strong resistance, despite the success of German columns in breaking through and surrounding large groups along the extended Russian front.

During the month of July the German forces continued to advance against strong Russian resistance on all sectors of the front. On the Finnish front General von Falkenhorst, in command of German and Finnish forces, advanced on Kandalaksha and captured Salla on July 10. Farther south on the Finnish front, combined German and Finnish columns drove

FERRETED OUT of a wheat field by German troops in the summer of 1941, these Russian guerrillas were promptly executed

GERMAN RESERVES moving up to Russian positions in the summer of 1941

forward toward Petrozavodsk and to the southeast along the Karelian isthmus. The capture of Petrozavodsk would result in cutting the Murmansk-Leningrad railroad. During the month, the reports of these operations were obscure, but it appeared that the Finns advanced steadily against growing Russian resistance. This advance seriously threatened the Russian right, north flank. On the north central front, German columns continued to advance in the direction of Leningrad and the Gulf of Riga. Large Russian forces were trapped in the vicinity of Tallinn. Other Russian forces were heavily engaged in the defense of the islands of Oesel and Dagoe in the Gulf of Riga. At the end of the month, Russian forces were engaged in bitter defensives against combined German-Finnish-Rumanian-Italian and Hungarian arms all along the extended front lines. In the centre, the Germans had advanced from Bialystok, in the direction of Smolensk, and captured the city on the 14th. Russian forces had withdrawn to the Vyazma area, and also were concentrated in the Rogachev area, and near Gomel. In this area, fighting had been severe during the entire month, and several counterattacks had been launched by the Russians against the southern flanks of the German columns advancing toward Smolensk, and after its capture advancing to the east. By Aug. 1, Germany had reached a line generally along the Vitebsk-Orsha and Mogilev sector while the Russian forces had in many cases remained behind to fight heavy rearguard actions which proved costly to the German armies. On the south, the Germans penetrated deeply into the Ukraine from the northwest in the direction of Kiev, and from the southwest in the direction of Balta and Odessa. During the period July 14 to July 17 in this sector, German columns approached closely to Kiev while Hungarian and German forces advanced more than 60 mi. across the former Russian-Polish frontier. Rumanian forces captured Kishinev, the capital city of Bessarabia. In the south, German columns were north and south of Kiev at the close of the month as the other allied forces continued to make advances through Bessarabia. Reports of large air and tank battles were made regularly by both sides and it is likely that these were of considerable importance. During the month of August, reports continued to indicate German advances all along the front. On the Finnish front it was reported that two large Finnish-German forces under the command of General von Falkenhorst had been increased in size and received additional equipment including planes. These forces continued a steady and deliberate advance to the east and on Aug. 15 captured Sortavala. On the south General Mannerheim was in command, and his forces continued their attacks along the Karelian isthmus and to the southeast around Lake Ladoga. Viipuri was captured toward the close of the month, and the front apparently became stabilized temporarily about 100 mi. northeast of Leningrad. In the Leningrad area, German forces under General von Leeb (*q.v.*) continued to push forward to clear up the situation around this city, and to reduce Russian resistance in the Tallinn area. Novgorod was captured on Aug. 16, and a few days later the German motorized columns cut the Leningrad-Moscow railroad, about 75 mi. southeast of the city. Throughout the month, heavy fighting took place around the suburbs of the city of Leningrad. On the central front, generally described as the Moscow front, German forces were commanded by General von Bock (*q.v.*). In this area the German forces met strong resistance east of Smolensk and to the south in the Gomel area. Strong German attacks drove the Russians out of Gomel toward the close of the month and the central German columns advanced to the east. Russian counterattacks were reported throughout the entire month against these German forces, and it appeared that the German advances were appreciably slowed down. On the southern front, the German forces under General von Rundstedt (*q.v.*), and the Rumanian forces under Antonescu (*q.v.*), continued the advance into the Ukraine and along the shores of the Black sea. Early in August the Odessa-Cherkasy railroad was cut by German armoured forces operating in this area. As a result of this action, large Russian forces were compelled to withdraw in the direction of the Crimean peninsula. German columns drove to the east in the direction of Kirvoi Rog, and to the south between Odessa and Nikolayev. On Aug. 15, Germany claimed the capture of Kirvoi Rog and also announced that German forces had advanced north of Nikolayev. Late in the month Odessa was surrounded and the Russians suffered heavy losses as a result of German attacks on convoys trying to evacuate forces from the city. On the 26th Dnepropetrovsk was captured and it appeared that the Crimean peninsula would be cut off from the mainland. All along the extended front from Murmansk to the Crimea, the Germans and their allies had advanced to the east during this month of August. Russian resistance had increased and Russian forces which had been encircled by German columns had refused to surrender and were continuing to offer serious resistance to capture or destruction. The Finnish front was not completely quiet but it appeared to be stabilized temporarily. Leningrad was under heavy and persistent attack and the Germans claimed that Tallinn had been evacuated by Russia with heavy losses. The German claims were indicative of complete assurance that the final victory was a matter of a short delay. It remains true, however, that throughout the month the claims of both sides were considered exaggerated and it was difficult to be convinced that a final outcome of the struggle was imminent. September proved to be a costly month for all forces engaged. Russia had serious losses, not alone in manpower, but also in vital areas. Viipuri was lost to General Mannerheim, and it appeared that continued advances would be made by the German and Finnish forces in the southern Finnish theatre. Such an advance would threaten Moscow from the northwest. There were some signs that a separate peace might be made with Finland, but these indications never became the subject of report from official sources. Leningrad had been completely surrounded, and to the west, Russia had lost Tallinn in Estonia. On the central front, strong German drives pushed the Russians to the east despite spirited defense. Some German forces on the right flank of the central group turned to the south to assist in the encirclement of Kiev in the Ukraine. Farther south, strong German columns attacked Kiev from the south and the southeast and besieged the city, the third largest in Russia. It appeared at first that the capture of this important centre would result in extensive losses of men and equipment, but the Russians claimed that they were able to withdraw large forces to the east. East of the city, the retiring Russian forces were engaged by the Germans, and severe losses were inflicted. The new direction of the German drive threatened Kharkov. Meanwhile, along the Black sea and the Sea of Azov, Odessa was still besieged and the Crimean peninsula cut off from the mainland. German attacks continued on this area and particularly upon the naval base at Sevastopol, and the eastern exit leading to Rostov. It was expected that the Germans would increase the tempo of the attacks in order to seek a decision before the advent of full winter weather.

In October, the German government announced a final drive on Moscow to end the war before the close of the year. Early in the month, Russian counterattacks began in the Leningrad area. Throughout the entire month, the German forces before this city appeared to be on the defensive frequently, and appeared to be unable to successfully attack and capture the city. In the Moscow area, Vyazma fell on Oct. 13, and within a few days the Russian government announced a state of siege in Moscow. German columns approached within 60 mi. of the city. On the Finnish front, strong attacks were launched in the Lake Ladoga region, and both the Russians and the invaders suffered severe losses. On the southern front, Odessa was captured, and in the Ukraine Stalino and Taganrog fell. The German advance on the central front continued and on Oct. 24 the leading elements were reported within 37 mi. of the capital city. On Oct. 25, Kharkov was taken and German columns moved forward rapidly to Rostov. By Nov. 1, it became apparent that despite these advances the speed of the German drives had slowed down. It was also expected that renewed drives would be initiated. In the Crimea, the capital city, Simferopol, was captured and the naval base at Sevastopol besieged. Air attacks upon Russian shipping in the Black sea continued to take heavy toll of lives and continued to disrupt the Russian plans for the defense of this area. German columns moved to the east toward Rostov and claimed the capture of that city. On the Moscow front, furious engagements with large losses on both sides found the Germans along the line Kalinin-Klin-Moshaisk-Maloyaroslavetz-Tula on Nov. 25. Moscow was in serious danger of capture. In the south, at the close of November, the Germans had withdrawn from Rostov to the west, and it appeared that they would go on the defensive in this area. Late in November the attacks on the city of Moscow were resumed.

December marked the limit of the eastern advance of the German forces.

Russia rallied, and with the aid of reserves of both men and supplies stopped the German assault. Some German attacks were made along all fronts during the month, but the principal German action was defensive and at times the Russian attacks took on the character of a pursuit. Around Dec. 15 the German forces began a general withdrawal to the west. This may have been an action which had been the result of a previously made plan to occupy a selected defensive position. It was not clear as the year closed whether the withdrawal was such a strategic decision or the result of spirited Russian attacks. Along the entire Moscow front, the Russian forces continued to launch heavy attacks at the close of the year. On the 29th, the Russians claimed the recapture of Kerch and Theodosia. On all fronts the Russians appeared to have adopted an extensive offensive which promised to be serious for the safety of the German position if it remained unchecked. The year ended on a hopeful note for the Russian nation; the greatest armed force on the continent had launched a determined attack lasting some six months and had failed to take the principal objectives of that attack. In addition, the Russians had not only stopped this attack, but had adopted the offensive and it appeared that unless the Germans built up a heavy defensive without delay, the Russians would be able to drive the invaders out of the country.

Summary: It appears that the German armies and their allies employed all known modern means to overcome the Russian armed forces. The announced plans of the German armies contemplated an early decision. The results of the first six months indicate that these plans were not accomplished. It appears that the method of mass defense used by the Russians, the enormous distances involved, the quantity of Russian arms available during this period, and above all the willingness on the part of all Russians, both in and out of uniform, to resist, combined to prevent the German success. Russia still remained a potent force in the east. Germany was not free to engage in any adventure of great consequence elsewhere on the continent so long as Russia remained undefeated. The strength of German forces available for another operation was decreased as a result of the Russian campaign. The spread of the war in December brought other powers into the conflict and made more serious the failure of the German armies to attain their Russian objectives.

G. The Far East.—During the greater portion of 1941, the undeclared far eastern war between Japan and the Nationalist Government of China continued, apparently apart from the European conflict. The Japanese, with the concurrence of the Vichy government of France, took over important bases in French Indo-China, and later, to all intents and purposes, completed the investment and occupation of that rich dominion. In China itself, Japanese operations were limited to minor campaigns in Hunan province, and to extensive aerial activity. Continuous heavy bombing attacks were made on Chungking, the capital of Nationalist China, and on the Burma road, which was becoming increasingly important as a supply route from the United States and Great Britain.

Then, on Dec. 7, 1941, in the midst of peace discussions with the United States, Japan struck at widely separated vital points. Japanese bombing planes scored heavily in a surprise attack on Pearl Harbor, the great United States base, nearly 4,000 mi. to the east of Japan. At the same time, Japanese naval forces attacked Guam, Midway and Wake—U.S. island stepping stones in the line of communications to the far east; and Japanese troops launched a series of invasion moves against Hongkong, Thailand, Malaya and the Philippine islands of Luzon and Mindanao.

In one day, the European and far eastern conflicts had merged into one world war. The United States, Great Britain, the Netherlands East Indies, the British dominions, and several Latin-American nations entered the war against Japan. A few days later, Germany and Italy, together with their satellite nations, came in on the side of Japan. All over the globe, the lines were now sharply drawn.

Japan's first blows were effective. At Pearl Harbor, the United States suffered heavy losses in damage to land and naval installations. One battleship, one target ship, three destroyers and one minelayer were lost, together with many aircraft. Guam fell, and a short time later Wake was occupied, after a gallant stand by a small defending garrison of 400 United States marines. On Christmas Day, 1941, Hongkong surrendered to the Japanese after relentless pressure for more than two weeks. Thailand capitulated almost immediately, and Japan used that country as a base of operations against Malaya. In Malaya, the Japanese moved swiftly. The British air base at Kota Bharu fell, and soon afterwards, Penang, the big naval base commanding the Straits of Malacca, on the west coast of Malaya. The Japanese then began a systematic advance down both sides of the Malayan peninsula. At the end of the year, Ipoh had been taken, and Kuantan and Kuala Lumpur were threatened. Sizeable landings had also been made on the Dutch island of Sumatra, and in British North Borneo and Sarawak.

Possibly the heaviest Japanese blows were struck in the Philippines. Landing some 200,000 troops at several beach-heads on the island of Luzon, the Japanese converged rapidly on Manila. The fall of that capital appeared imminent at the close of the year, although the small defending forces of United States and Filipino troops seemed capable of further resistance for some time. The occupation of the island of Mindanao was completed by the Japanese, against comparatively weak resistance.

As the year 1941 ended, the air and naval forces of the Netherlands East Indies and the United States had done appreciable damage to Japanese warships and transports, but on the whole, the Allies were still gathering strength for defensive and offensive action in the far east.

III. The War at Sea.—World War II up to Jan. 1, 1942 had seen conflict on the surface, under the surface and above the surface of nearly all the ocean highways travelled by the ships of all the nations of the world.

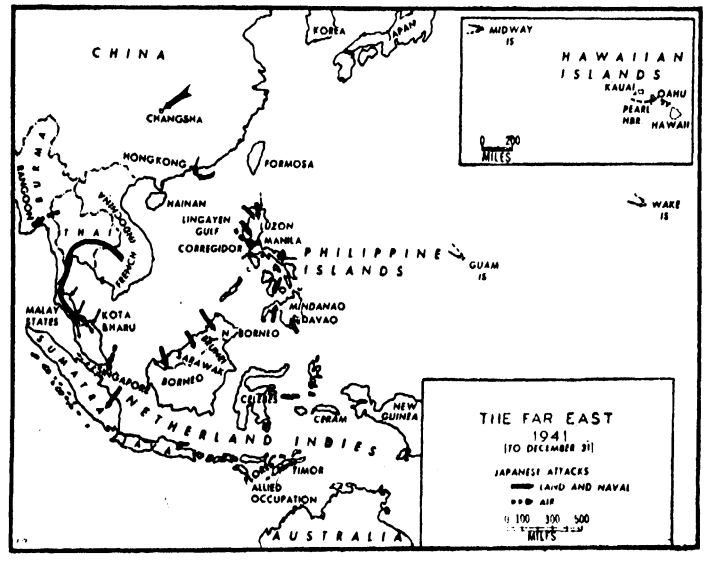
Sea power, the predominant force in determining so many of the great struggles in history, still remained a vital and unsolved problem during 1941. In the great world conflict between dictatorships and the democracies, the democracies controlled the seas, although they were subject to severe challenge in the Atlantic and in the far east at the close of the year. The British empire, with a powerful fleet, had strong naval forces based upon the British Isles, the Mediterranean sea—both in the east and in the west—and at Singapore in the far east. Other additional strong units were operating along West African shores covering routes to South Africa and to India, as well as additional forces operating along Red sea and Suez routes. The British had approximately 20,000,000 tons of merchant shipping when the war began in 1939. From various countries defeated by Germany she acquired additional tonnage available outside the European continent. Purchases from neutrals and her own ship-building program increased the grand total available for the prosecution of the war. Estimates place the grand total tonnage at around 26,000,000 tons. In these respects, naval strength and merchant tonnage, the British had a decided advantage in the conduct of the war at sea. (*See* also NAVIES OF THE WORLD.)

The British plan of operation included the protection first of the mainland of the home country, and with this, the protection of the merchant fleet bringing war supplies to the home front and to other fronts. It followed that the converse action for the British naval forces was the denial of free access to the merchant shipping lanes of the world to the opponents; and, whenever the opportunity arose, direct naval action against enemy naval forces, and the support of the empire land and air forces in operations against the enemy.

The circumstances of World War II contrast sharply with those of World War I insofar as the war at sea is concerned. In World War II, Italy was an axis partner and had to be dealt with in the Mediterranean sea and in the Red sea and Suez areas. Japan was an enemy and seriously threatened the security of the empire in the far east. While the Dutch East Indies were allies, the source of vital supplies in this area, and the security of the Commonwealth of Australia and of New Zealand, became new responsibilities of the British naval forces. In addition, British naval bases in the far east at Hongkong and at the formerly friendly ports controlled by the French were in Japanese hands. The area to be denied to the enemy by blockade was enormously increased. Germany controlled the western European coastline from Narvik to Spain. From a hundred land bases for planes, and dozens of excellent harbours for surface raiders and submarines, the enemy could launch strong and continuous attacks against the blockade forces and against the merchant shipping lanes. The Vichy French government was in a doubtful position insofar as the eventual control and use of the remainder of the defeated French fleet was concerned. To the naval craft and surface raider and the ever-present submarine had been added the powerful effect of the air arm. Geography, airpower, the loss of allies, increased demands for supplies . . . these appeared to be the principal characteristics of the conduct of the war at sea for the British in World War II.

The axis powers, increased late in the year by the addition of the Japanese, had considerable strength for the conduct of warfare at sea. If Germany was short on battleships, she had considerable strength in submarines and employed available new Atlantic bases to full capacity. Italy had a Mediterranean fleet which might not compare in excellence with the British, but which had to be defeated before the Mediterranean would be free for the movement of vital supplies of men and materials. In the far east, Japan had a powerful fleet not fully tested in modern warfare, but demanding the full attention of the British and United States forces engaged in that theatre. To all this axis naval strength, must be added the new and powerful air arm which appeared to be more useful to the axis than to the Allies so far as the developments until the close of the year indicated. With these forces opposed to each other, the conduct of operations in the war at sea for 1941 produced important results.

During 1941 the battle of the Atlantic, the battle of the Mediterranean, and the battle in the far east, were the leading events in naval warfare. In the battle of the Atlantic, Germany announced a war-zone area including the British Isles and Iceland and extending to the three-mile limit around Greenland and south to the French coast. From the western coastline of Europe, German attacks were launched against the British naval forces. The object of these attacks was to cut the vital lines of supply bringing war materials to the British. A secondary but included objective was to reduce the strength of the British naval forces whenever opportunity permitted. Surface raiders ranged throughout the North and South Atlantic waters attacking and sinking merchant ships, avoiding if possible any action with naval forces. Submarines in large numbers, frequently on individual missions, but often in packs of six or more, slipped through blockade lines to wait for their prey along the shipping routes to the British Isles. Overhead, the large seaplanes carried death and destruction to both ships and crews by bombing raids against supply ships, and by acting as scouts for the submarine packs waiting for the kill. Reports indicate that during 1940, British weekly losses were around 70,000 tons due to this type of



U.S. SOLDIERS at their post in a machine-gun nest during the Japanese attack on Oahu, Hawaii, Dec. 7, 1941

war at sea. In Jan. 1941 the British claimed a new low in shipping losses when they put the total for one seven-day period at 37,000 tons. Losses increased in February, and in March 1941 a new high was reached when figures released by the British admitted a total of tonnage lost for one week at 148,000. Shortly afterwards the British Admiralty announced that totals would not be published in the future, and it appeared that the Germans had begun to succeed in the war at sea in the Atlantic. (*See* also BLOCKADE; SUBMARINE WARFARE.)

The introduction of the convoy system, the acquisition by the United States of new bases in the North Atlantic, the improvement in anti-aircraft defense within the British Isles, the prompt destruction of German naval units seeking battle, and the wide extension of British air power in offensive action against German bases on the continent, resulted in the reduction of these shipping losses. In addition, both the British and the U.S. shipyards established new records for speed in turning out new units for the maintenance of vital supply lines. These factors helped during the period from April to Dec. 1941 when the entrance of Japan into the conflict introduced the possibility of serious change. All British and United States forces removed from the Atlantic to the far east would reduce the effectiveness of their joint resistance against Germany in the Atlantic area. At the close of the year, the war at sea in the far east had not developed sufficiently to warrant an analysis of these effects.

On May 27, 1941 the German battleship "Bismarck" was sunk in the North Atlantic after a spectacular naval engagement with units of the British fleet. Reports indicate that the German battleship left the Norwegian coast from a naval base at Bergen on May 22, crossed the North Atlantic to the vicinity of Greenland, and was sighted by British naval forces near Iceland on May 23. Apparently the objective of the "Bismarck" was to attack and destroy British naval units operating merchant-ship convoys in these waters. On May 24, British and German naval forces engaged in battle in this area. The scene of the first action was in the body of water known as the Denmark strait between Iceland and Greenland. The "Bismarck" was slightly damaged during this encounter. However, the British battle cruiser "Hood" was sunk and the "Prince of Wales" damaged. The "Bismarck" disengaged from this combat and the pursuit was undertaken by several units of the British home fleet. Air attacks were delivered by planes based on the aircraft carrier "Victorious" before all sight of the "Bismarck" was lost. On the morning of May 26 an American-built naval patrol plane with the British fleet sighted the "Bismarck" en route to the shelter of the French coast. Several large British units as well as other vessels closed in for battle. Torpedo bombers from the carrier "Ark Royal" severely damaged the "Bismarck" and the battleship was forced by this action to reduce its speed. Destroyer units launched attacks which rendered the enemy steering action useless, and the warships "Rodney" and "King George V" silenced the "Bismarck" guns. On the morning of the 27th, the British vessel "Dorsetshire" sank the "Bismarck" off the French coast by torpedo attack. This engagement in the war at sea indicated the two principal types of naval action in modern warfare. The first principle was the ship-versus-ship action during which the battle cruiser "Hood" was lost, and the "Bismarck" damaged. The second was the discovery, and the attack upon the "Bismarck" by patrol and torpedo planes. The first type of action is in the classical tradition of naval warfare. The second is comparatively new and while at that time not decisive, the air action contributed considerably to the final destruction of the opponent. The loss of the battle cruiser "Hood" was a severe blow to the British. However, the loss of the new battleship "Bismarck" to the German fleet represented a greater loss of strength in comparison between the relative strengths of the two navies. No decisive answer had been made to the erroneous but persistent question of the battleship *vs.* the aeroplane.

The balance of the war at sea in the Atlantic was concerned with the operations of convoys, the occasional excursion on raids against the European coast, and protection of the home front and coast lines against invasion.

In the Mediterranean sea the British were faced with a different but equally important task in the war at sea. The British control of Gibraltar and of the Suez was essential to the conduct of the war. These entrances into the Mediterranean had to be in British hands if the Italian naval forces were to be denied the use of the Atlantic, and if the British were to continue to use this area as a supply route for the home front. The narrow channel between Sicily and Tunisia, about 90 mi. in width, offered the Italians opportunities to launch attacks upon forces moving along the east-west routes between Gibraltar and the Suez. This geographical factor meant that the whole Mediterranean area was divided into two theatres of action. In the western theatre the fall of France meant the loss of Toulon, Corsica, Bizerte, Algiers and Oran, as naval bases for joint British and French use. It will be recalled that the existence of France and Italy as allies during World War I made all these circumstances aids to the British rather than danger zones. Far from controlling this area, the British faced a constant struggle to maintain themselves in the war in the Mediterranean sea.

In Jan. 1941 the British aircraft carrier "Illustrious" was crippled by air attacks while the cruiser "Southampton" was so badly damaged by an air attack it was beyond salvage value and was sunk. In this action at least one destroyer, the "Gallant," was seriously damaged. These attacks from the air were launched in the narrow channel between Sicily and Tunisia. The fact that they could be launched and could result in such extensive damage indicated the strong challenge to continued British use of the east-west route through the Mediterranean.

In February, the British fleet made raids along the eastern Adriatic coast line off the shores of Albania, and also attacked the naval base at Genoa. Earlier raids had already been made against the base at Taranto in 1940. These raids were combined with air attacks to reduce the possibilities of continued Italian naval action.

In March, the British fleet engaged a strong Italian force in the vicinity of Cape Matapan. These Italian forces moving east in two columns, approached the island of Crete from the west. The British forces moving west from Alexandria and Suda bay in Crete attacked the southern column of the Italian force. One Italian battleship the "Vittorio Veneto" was badly damaged, three heavy cruisers were lost, and two destroyers were also sunk. The British reports indicated no losses in this action. This engagement went far toward establishing the British control in the eastern Mediterranean.

During the Libyan campaigns and also during the campaigns in Greece and in Crete the various elements of the British fleet took part. These actions were not considered to be limited solely to naval forces and are described in the analysis of the military operations.

In the far east the war at sea was confined for the most part to occasional surface-raider attacks upon shipping, and to the limited action of the Japanese naval units against stray Chinese merchant vessels. These circumstances obtained until the entrance of Japan into the war in December. The Japanese war at sea was not confined alone to the operation of naval units. The attacks upon Pearl Harbor in the Hawaiian group, and upon Guam, Midway and Wake islands were combined naval and air actions. In addition the attacks upon the Philippines, upon the Malayan coast and the East Indies were the result of combined action. The most spectacular naval action was the result of the engagement between the British battle cruiser "Repulse" and the British battleship "Prince of Wales" with Japanese air forces. Without adequate air protection these British vessels were attacked and sunk by Japanese air forces. This action appeared to be the only outstanding plane versus ship operation during the year in the war at sea.

In considering the old question of the plane versus the battleship this action should prove at least one point, which is that the question in itself is irrelevant. Battleships without adequate air support are subject to attack and destruction. It follows that there must be unity of command wherever air and other units are employed in the same action. These forces are complementary in their effects and must be balanced and controlled as the separate instruments in an orchestra are harmonized and led by a single conductor.

IV. The War in the Air.—The war in the air during 1941 extended the action and supported the belief that air power is essential to the successful conclusion of major operations in modern warfare. During the principal military campaigns air power continued to play a decisive role in co-ordinated operations with ground and naval forces. Air warfare over Britain and the British air warfare over the axis-controlled areas of the continent did not produce decisive results. No major lesson can be drawn regarding the relative merits of one form of warfare employed alone in any action, as compared to any other form of warfare employed alone in any action. In Crete the transportation of all effective ground forces, and their support during the operations, were accomplished by air forces. In this action a landing was made on a hostile position defended by superior land and naval forces. Off the Malayan coast Japanese air forces attacked two British ships and destroyed them. In each of these instances the attacker had complete air superiority. The conclusion to be drawn appears to be that the surface forces, both ground and naval, cannot secure decisive results without securing equality, or temporary superiority, in the air. In Britain, and also on the continent, air forces alone had been unable to secure decisive results. This necessity for adequate air strength acting in concert with other forces in the conduct of operations, is further dependent upon the adoption of unity of command. These are not new lessons of warfare. The number of

operations in the war in the air, and the magnitude of the world conflict emphasize their importance.

Aside from the use of air forces in the separate campaigns discussed under military operations, the principal war in the air was concerned with the battle of Britain and the subsequent opening of the battle of Germany. Early in the year Lord Beaverbrook (*q.v.*), British minister for air, stated in effect that Britain had more aeroplanes of every type in operation than ever before in her history. During January the British made the first mass air raid on German bases on the continent. Since Dec. 29, 1940, when German air raids over London had been most severe, the axis planes appeared to have reduced the number and the intensity of their attacks. Britain meanwhile had adopted the offensive and was gradually extending the radius of distant attacks on Germany. The lull in German attacks continued in February and many estimates were made as to the dispositions and probable employment of the German air forces. Some British estimates placed the German air force combat-plane strength at 19,000 ships. A United States estimate suggested that Germany had about 18,000 first-line planes, with another 18,000 for replacement, available for an attack on England. No large-scale attack of this character developed during the year. The report of these estimates indicates the concern over the possibility of the use of air power, and suggests that this air power exerts effect both when used and when not used in actual attack.

It was apparent that the British plan for the conduct of the battle of Britain in 1940 had been changed for 1941. In 1940 the British had fought savagely to maintain air equality over the islands, and had attempted occasional air raids over the channel. Now the British extended offensive air action in attempts to destroy invasion bases and to reach far inland to destroy the German capacity to concentrate and support a large-scale invasion. In addition the British extended the use of the air arm to assist naval and ground forces in some of the operations in the Mediterranean. It was reported that British parachute troops had been dropped in southern Italy during February. In March the British claimed extensive air raids over the continent, as far to the east as Cracow. The loss of life due to air raids over Britain dropped to a new low of 1,500 per month compared with the tragic high figure of some 6,900 for the month of Sept. 1940. It appeared that the British air strength had increased to warrant full support of the new British plan for the conduct of the war in the air during the early months of 1941.

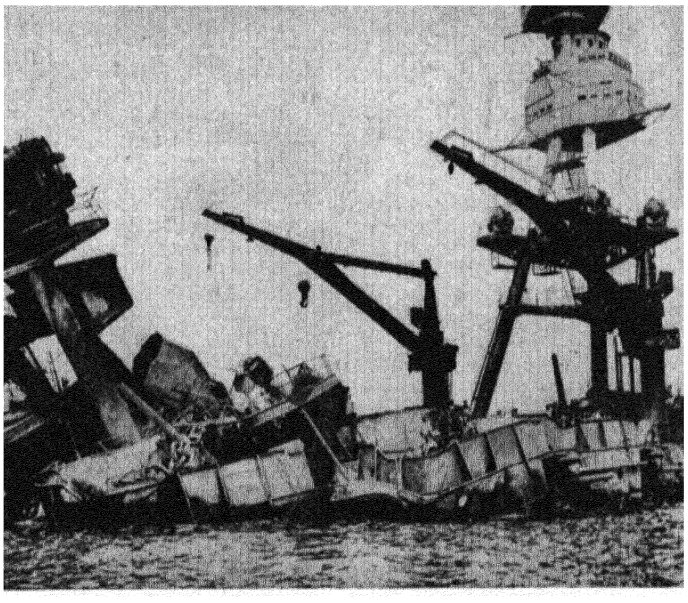
During April, furious German air raids began again over widespread areas in England. Despite heavy losses these raids continued during April and May. In mid-June, after a period of relative quiet, the British initiated the first of their large-scale daylight raids over the channel coast and the German bases. The opening of the German war against Russia, and the acquisition of the Iceland base by the United States combined to offer new opportunities to the British in the conduct of the war in the air. New supplies of ships and supplies could be expected from the United States. German air forces would be engaged in the Russian war.

Britain swiftly improved its air equipment, developed its air defense and air offensive tactics and launched repeated attacks against the continent. In July Germany launched no reprisal raids. Scattered German attacks were made over England during August and September. During September the German air forces appeared to be concentrating on shipping, both along the sea lanes and also against the ports of entry on the coast. British claims in October indicated that the Germans were dropping large land mines, which might have caused the extensive damage to Coventry and to other English towns in earlier raids. The intensity of the British raids over the continent continued during the balance of the year. Ports were bombed, industrial areas were destroyed, Berlin was under frequent attack and at times both the British and the Russian forces combined in launching raids over the German cities. The full extent of the British raids had to be reduced during a part of November due to poor weather and also because the German anti-aircraft defenses had been improved. This increased resistance resulted in heavy losses of pilots and planes for a short period during this month.

The year closed with the British definitely equal in strength and frequently superior in strength to the German air forces. Complete air superiority appears to be an impossibility. Temporary air superiority may be secured for a short period of time and as a result of large concentrations for operations frequently resulting in large losses of men and materials. Regardless of the excellence of the modern air defenses, some planes will get through to launch at least minor attacks which are not designed to bring about decisive results.

The war in the air developed within the German forces a system of close co-ordination with ground and naval forces. Unity of command appeared to be the rule. While a separate air force existed in Germany, complete co-ordination appeared to be secured at all times. The British developed a satisfactory type of plane detection for use during day and night, organized fighter commands and coastal commands of great strength and flexibility and, despite occasional heavy losses, adopted extensive offensive actions over the continent. British air co-operation with ground and naval forces was erratic but showed improvement. Considerable improvement could be expected as soon as the principle of unity of command in operations became the rule instead of the exception.

(*See* also ADVERTISING; AGRICULTURE; AIR FORCES OF THE WORLD; ARCHITECTURE; ARMIES OF THE WORLD; BANKING; BUSINESS REVIEW; CHEMICAL WARFARE; CHILD WELFARE; CHINESE-JAPANESE WAR; CONTRACT BRIDGE; COTTON; CRIME; CZECHOSLOVAKIA; EDUCATION; EXCHANGE CONTROL AND EXCHANGE RATES; FASHION AND DRESS; GOLD; HISPANIC AMERICA AND WORLD WAR II; HORTICULTURE; HOSPITALS; INTERNATIONAL LAW; INTERNATIONAL TRADE; IRON AND STEEL; JEWISH RELIGIOUS LIFE; LUMBER; MEDICINE: *Medicine in the War;* MINERAL



Harbor, Hawaii, after the Japanese raid of Dec. 7, 1941

Commanding Generals of Various Campaigns in World War II (1941)

The following list may be inaccurate. Commanding generals were not in all instances officially announced during 1941. The listing is based on unofficial reports. Up to Jan. 1, 1942, for example, it was not definitely known whether Milch or von Falkenhorst was the actual leader of the German attack on Crete nor who was the new chief of the Japanese imperial general staff. There was so much confusion attendant to the leadership in these campaigns, that the author of the article on World War II purposely omitted emphasis on names in the compilation of the material.

A. Balkan campaign
Yugoslavia: Dushan Simovitch*, commander in chief
Great Britain: Sir Henry Maitland Wilson and Sir Thomas Blamey
Greece: Alexander Papagos, commander in chief; Giorgios Tsolakoglou (Epirus)
Germany: Walther von Brauchitsch*, commander in chief of army

B. Crete
Great Britain: Bernard Cyril Freyberg
Germany: —

C. East Africa
Great Britain: Sir Alan Gordon Cunningham*
Italy: Duke of Aosta

D. North African campaign
1. First phase (Jan. 1–March 31)
Italy: Rodolfo Graziani
Great Britain: Sir Archibald Percival Wavell*
2. Second phase (March 30–April 30)
Italy: Italo Gariboldi
Germany: Erwin Rommel*
Great Britain: Sir Archibald Percival Wavell*
3. Third phase (Nov. 18–Dec. 31)
Italy: Italo Gariboldi
Germany: Erwin Rommel*
Great Britain: Sir Alan G. Cunningham*, succeeded by Neil Methuen Ritchie*

E. Near East
1. Iraq
Great Britain: Sir Archibald Percival Wavell*, commander of British middle eastern forces
2. Syria
Great Britain: Sir Henry Maitland Wilson
Free French: Georges Catroux
Vichy France: Henri Fernand Dentz*
3. Iran
Great Britain: Sir Archibald Percival Wavell*
U.S.S.R.: Vassili Novikox
Iran: —

F. Russian campaign
Germany: Walther von Brauchitsch*, commander in chief of army (removed Dec. 19) and Wilhelm Joseph Franz Ritter von Leeb* (north); Fedor von Bock* (centre); Karl Rudolf Gerd von Rundstedt* (south)
U.S.S.R.: Klimenti E. Voroshilov* (north); Simeon K. Timoshenko*, succeeded by Georgi K. Zhukov* (centre); Simeon M. Budenny*, succeeded by Timoshenko* (south)

G. Far East
Allied supreme commander: Sir Archibald P. Wavell*
United States: Douglas MacArthur* (Philippines); Thomas C. Hart*, commander in chief of Asiatic fleet
Great Britain: Sir Robert Brooke-Popham*, succeeded by Sir Henry R. Pownall* (Malaya); Sir Tom Phillips*, commander in chief of far eastern fleet (died Dec. 10)
China: Chiang Kai-shek*, commander in chief
Dutch East Indies: Hein ter Poorten*, commander in chief
Japan:—Masaharu Homma (Philippines); Tomoyuki Yamashita (Malaya)

*See separate biography in *Britannica Book of the Year 1942*

AND METAL PRICES AND PRODUCTION; MUNITIONS OF WAR; NEUTRALITY; NEWSPAPERS AND MAGAZINES; PACIFISM; PETROLEUM; POLICE; PROPAGANDA; RAILROADS; RELIGION; STOCKS AND BONDS; STRATEGIC MINERAL SUPPLIES; TARIFFS; ZOOLOGICAL GARDENS; *see* also various countries of the world.) (H. A. DR.)

WPA: *see* FEDERAL WORKS AGENCY.

WPB (War Production Board): *see* PRODUCTION MANAGEMENT, OFFICE OF: *The War Production Board.*

Wren, Percival Christopher (1885–1941), British soldier and novelist, was born in Burroughs court, Devonshire, and was educated at Oxford. After leaving school, he roamed the world and was in turn a sailor, schoolmaster, college principal, peddler, boxer, journalist and explorer. He settled in India for 10 years as assistant director of education for the Bombay government and during World War I served in the Indian army in East Africa and the French foreign legion. His experiences as a legionnaire furnished the material for his most popular work, *Beau Geste* (1924), an immediate best-seller. He also wrote *Beau Sabreur* (1926), *Beau Ideal* (1928), *Good Gestes* (1929). His other works included: *Dew and Mildew* (1912), *The Wages of Virtue* (1916), *Stepsons of France* (1917), *The Disappearance of General Jason* and *Two Feet from Heaven* (1940). He died in Amberley, Gloucestershire, Nov. 23.

Wrestling. With professional wrestling on the down-hill for a half a decade, no recognition was given to new or old champions by state ruling bodies. Only in a few mid-western cities was any interest shown in the professionals, comprising old timers and others trying to impress the galleries. Amateur wrestling, on the other hand, was popular. The National Collegiate A.A. awarded top honours in 1941 to grapplers of Oklahoma A. and M., who took four titles. Two brothers from Michigan, Merle and Burl Jennings took the 121 and 128-lb. classes. In National A.A.U. competition, the N.Y. West Side "Y" captured the team title with one victory and several places. Princeton and Yale tied for the team title in the Eastern Collegiate championships, with Navy taking two of the titles.

(J. B. P.)

Wyoming. A Rocky mountain state, admitted to the union July 10, 1890, as the 44th state. Leadership in the extension of rights to women gave it the name "Equality state." Area, 97,914 sq.mi.; pop. (1940) 250,742. The rural population was 157,165; urban, 93,577; 229,818 native white, 950 Negro, 17,107 foreign born, 2,345 Indians, 390 Japanese and 43 Chinese. Capital, Cheyenne (22,474). Other principal cities are: Casper (17,964); Laramie (10,627); Sheridan (10,529).

History.—Elective state officials in 1941 were: governor, Nels H. Smith (R.); secretary of state, Lester C. Hunt (D.); auditor, William Jack (D.); treasurer, Mart T. Christensen (R.); superintendent of public instruction, Esther Anderson (R.).

The 26th state legislature enacted few laws in 1941. A teachers' retirement act was passed, but was vetoed. Communists were barred from primary and general election ballots. Defeated were attempts to replace the 2% sales tax with a gross receipts tax, to establish a drivers' licence law, to legalize gambling, to move the college of agriculture, and to remove regulations on trucking. Ninety per cent of the more than 300 bills introduced in both houses were designed to correct defects in existing laws.

Education.—In 1940 there were 944 rural schools with an enrolment of 9,531 and 943 teachers. There were 39,917 elementary-school pupils and 947 elementary-school teachers. There were 135 high schools with 16,825 pupils and 661 teachers. The University of Wyoming, the only institution of higher learning in the state, had 1,860 students and 165 teachers in 1941.

Public Welfare, Charities, Correction.—The total of federal, state and county public-welfare disbursements Oct. 1, 1938 through Sept. 30, 1940 was $3,928,952.96. Of this amount, $1,776,606 was for old-age assistance; $517,727 for aid to dependent children; $103,135 for aid to the blind; and $687,816.12 for general welfare. Wyoming had four correctional institutions in 1941—state penitentiary, penitentiary farm, industrial institute for boys, and girls' school. State expenditures for these institutions in the year ending Sept. 30, 1940 amounted to $205,182.80.

Communication.—There were, in 1941, 23,000 mi. of roads, of which 3,400 mi. were hard surfaced. The state highway department spent $5,416,260.48 during the year ending Sept. 30, 1940. There were 1,992.69 mi. of railroad in the state. In 1941 there were 48 airports and two major air lines.

Banking and Finance.—There were 32 state banks and 26 national banks in Wyoming on June 30, 1941. The state banks had deposits of $20,329,994 and resources of $23,264,333.83. The national banks had deposits of $52,849,991.58 and resources of $59,229,221.10. The state had nine insured savings and loan associations in 1941, with assets of $4,598,860. For the year ending Sept. 30, 1940, the total of state receipts was $15,467,985.93; total disbursements, $14,260,447.86. The state's bonded debt on Sept. 30, 1940 was $3,878,000.

Ranching and Agriculture.—Livestock and crop conditions were unusually good in 1941. Wyoming livestock products sold for $52,515,200, and its farm crops were valued at $30,556,350.

Table I.—*Leading Ranch and Farm Products of Wyoming, 1941 and 1940*

Product	Value 1941	Value 1940
Cattle	$26,295,750	$19,000,000
Sheep	13,338,000	11,000,000
Wool	11,881,450	10,000,000
Hogs	1,000,000	600,000
Alfalfa (707,000 tons)	5,161,000	4,164,400
Wheat (5,598,000 bu.)	4,742,320	2,557,700
Sugar beets (526,000 tons)	3,419,000	2,546,000
Dry beans (667,000 cwt.)	2,334,500	1,270,500
Corn (2,928,000 bu.)	2,168,720	1,215,900
Wild hay (320,000 tons)	2,080,000	1,688,100

Manufacturing.—The value of all manufactures, excluding oil refining and dairying, was estimated at $26,000,000 in 1941.

Table II.—*Principal Industries of Wyoming, 1939 and 1937*

Industry	Value of products	
	1939	1937
Petroleum refining	$24,671,993	$20,093,404
Bread and other bakery products	1,315,075	1,419,501
Butter	968,991	1,076,855

Mineral Production.—The total value of Wyoming's mineral production in 1941 was estimated at $190,950,000.* The greatest gain over 1940 was in petroleum production. There were 35 active oil fields.

Table III.—*Principal Mineral Products of Wyoming, 1941 and 1940*

Mineral	Value 1941	Value 1940
Petroleum (refined value)	$165,000,000*	$152,420,000*
Bituminous coal	18,750,000	16,000,000
Iron	3,500,000	3,000,000
Bentonite	1,500,000	1,500,000

*Estimates of state minerals supervisor; figures include oil refined in state, oil used on roads and oil piped outside state for refining.

(A. T. L.)

X-Ray. Advances in the diagnostic and therapeutic fields of medical radiology during 1941 were all in the nature of improvements in apparatus and refinement of methods rather than in any completely new discoveries.

A method of film reproduction which would undoubtedly have important applications not only in the organization and storage requirements of X-ray departments but in medical education, teaching and research was developed.

The filing and storage of roentgenograms have always been a real problem in hospitals and large clinics. Because of their value in studyihg the progress of disease in individual cases or as records in medico-legal cases or for teaching purposes, some institutions require that all roentgenograms must be preserved indefinitely. Others, because of lack of storage space, permit destruction of films after varying periods, three, five, eight or ten years.

A method was worked out by Sutherland for reproduction of roentgenograms which would largely solve the storage difficulties and at the same time would make vast numbers of roentgenograms available for study and teaching as they have never been before. The method consists in reproduction of the original roentgenogram of whatever size on a 35 mm. film; its preservation either in rolls or in individual mounts or both, and its examination in a specially devised illuminator with magnification, or by projec-

tion on a screen. This reproduction can be accomplished without essential loss in the detail of the original film.

The procedure recommended by Sutherland is as follows: A master film is made (the equivalent of the intermediate in the making of a lantern slide) and two copy rolls (facsimiles of the original roentgenogram). He suggests that the master film may be retained by the department concerned with the making of prints for publication, etc., while one copy roll may be used in the radiological department where it may be cut into individual films to be preserved in envelopes or placed in suitable mounts. These may replace the original films in the hospital file and can be used for lantern slides where desired. The second copy roll may be used for teaching purposes or as a reserve in case the master film or small mounts should be destroyed. The first and most obvious advantage in this method is the reduction in the volume of the file. Instead of requiring much shelf room for filing various-sized films, a small cabinet may be substituted. A unit occupying 20x20 in. floor space will accommodate 320,000 individual miniature reproductions in an orderly arrangement. The economic saving in the reduction of floor space necessary for filing films is impossible to estimate but it would be very great.

A second advantage of the method is the ready availability of the miniature films for study. If it is found desirable, an entire roll of 800 miniatures may be studied by use of a small projector and this can be done in any convenient place without transportation of large films.

A third advantage is the insurance against loss of valuable records which have not only scientific but clinical value. The entire film storage space in an institution may be destroyed by fire or other catastrophe. By having the duplicated miniatures stored in different places and easily transportable the liability that they would all be destroyed is greatly reduced.

The fourth advantage of the method is its contribution to teaching. Films can be made available in large numbers to the departments of anatomy and pathology in medical schools, and to the clinical departments which now use the X-ray to such a large extent and which may have on hand sets of films of every subject.

Sutherland suggests the desirability of establishing a great central depository of roentgenograms covering every medical and surgical subject in which the X-ray is of use, including those diseases which are not common in the United States. It is difficult to exaggerate the value of such a collection in the army medical library where it would be open to the entire nation. (*See* also HEART AND HEART DISEASES; PHOTOGRAPHY; TUBERCULOSIS.)

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Yachting. In spite of the many influences both in the United States and elsewhere, which were far from beneficial, the yachting season of 1941 saw record and near-record numbers of boats in commission in the majority of yachting centres all over the U.S.A. Many of the larger craft were sold or given to the navy and the coast guard during the year; and, although this gave still further impetus to the trend to smaller boats, the net effect on the total number of yachts and yachtsmen was negligible.

The biennial transpacific race from San Pedro to Hawaii brought out a fleet of only seven for the 2,225-mi. slide down the trade winds to Diamond Head. They were all west coast craft and the finish was, as usual, very close, D. W. Elliott's "Escapade" winning by less than four hours after 14 days at sea.

The premier long-distance race on the Atlantic coast was sponsored jointly by the Storm Trysail club of New York and the Hampton Yacht club of Virginia with the start at New London, Conn. and the finish off the latter club's anchorage. Three of the U.S. naval academy's sailing yachts participated and performed notably but the winners were James H. Grove's cutter "Blitzen," in Class A and Harvey Conover's sloop "Revonoc" in Class B. The Chicago and Detroit-Mackinac races, premier events of the Great Lakes season, brought 50 and 27 starters, respectively, with honours going to Sumner Scott's ketch "Breeze" and John Timken's cutter "Kitty Hawk."

There was no racing in the large one-design and rule classes on Long Island sound and very little at Marblehead, Mass., the old strongholds of large yachts. At the Larchmont Yacht club's annual race week on the Sound the number of entries suffered another disheartening decline. At Marblehead the situation was not as bad, but year after year it had become more and more apparent that these old-established centres of yacht racing no longer held the pre-eminent position they once enjoyed. In contrast, Great South bay's race week, the various regattas on Chesapeake bay and leading events at Cleveland, Detroit, Chicago, and other Great Lakes cities and on the Pacific coast, all found as many or more boats than ever before competing for honours.

There was, of course, no international yacht racing in 1941, and in its absence national championships in the various classes took on added significance. George Fleitz sailed "Wench" to the championship of the Star class in a close, hard-weather series off his home port, San Pedro, Calif. Phil Somervill of Edgewater Park, N.J., retained his Comet class title by outsailing 34 others in another bit of breezy weather at Sandusky, O. The fast-growing Lightning class crowned John M. Stern of the Buffalo Canoe club its champion. The championship of the Snipe class, most numerous one-design class in the world, was won by Darby Metcalf of Los Angeles, Calif.

The Sears Bowl, emblematic of the national Junior title, was successfully defended by Robert Coulson's Eastern Yacht club crew of Marblehead, Mass., but with Cold Spring Harbor, N.Y. and Vineyard Haven, Mass. only one and two points behind. A Riverside (Conn.) Yacht club crew, headed by Miss Lois MacIntyre, took the women's national title with comparative ease.

(H. L. ST.)

Yale University. An institution of higher education at New Haven, Conn. The opening of the Yale medical library was an outstanding event of the academic year 1940–41. The building, provided by funds from the estate of John W. Sterling, '64, and designed by Grosvenor Atterbury, '91, houses the general medical library and the historical library. The historical library contains the great collection of medical and scientific history bequeathed by Dr. Harvey Cushing, '91, and the collections given by Dr. Arnold C. Klebs, Dr. John F. Fulton and many others.

During the year the curriculum of the school of music was reorganized for the advanced study of music. The Norfolk music school of Yale university at Norfolk, Conn., established by the bequest of Ellen Battell Stoeckel, opened its first summer session on June 23, 1941, under the direction of Dean Bruce Simonds.

The Art gallery received the early American miniatures collected by John Hill Morgan, '93, and the Lewis Fox Frissell collection of Sandwich glass.

Gifts and bequests received by the university during the year ending June 30, 1941, totalled $3,260,282; gross additions to funds were $1,994,019, including interest on certain funds; total endowment and reserves were $112,096,810, with a net after investment losses of $102,188,407. In addition the Sheffield Scientific school trustees had assets of a book value of $2,243,667.

(C. A. L.)

Yamamoto, Isoroku (1884–), Japanese naval officer, was born in April. He was graduated from the naval academy in 1904 and fought as an ensign in the Russo-Japanese war. He was naval attaché in the Japanese embassy in Washington, 1925. As Japanese delegate at the London naval conference in 1934–35, he successfully fought the Anglo-American proposal to extend the naval "holiday." The talks foundered on the issue of parity between the U.S. and Japan, and Yamamoto won rapid promotion for his work in London. Foremost Japanese advocate of combining air and sea power in naval attacks, he was promoted to commander-in-chief of the fleet in 1939. Referring to the Japanese surprise attack on Pearl Harbor, Domei (Japanese) news agency revealed in a dispatch on Dec. 17, 1941, that the strategy of surprise carried out by Adm. Yamamoto was planned by him earlier. Domei also quoted a letter written by the Japanese fleet commander to a friend almost a year before, in which Yamamoto assertedly declared: "Any time war breaks out between Japan and the U.S., I shall not be content merely to capture Guam and the Philippines and occupy Hawaii and San

Francisco. I am looking forward to dictating peace to the U.S. in the White House at Washington."

Yemen: *see* ARABIA.

Young Men's Christian Association.

In 1941 Frank A. Bayley was president; Eugene E. Barnett, general secretary. (Corporate title: The International Committee of Young Men's Christian associations.) The 1940 Y.M.C.A. Yearbook listed 1,292 local associations with 1,224,410 members in cities, high schools, colleges, rural areas, railroad and industrial centres, and near military establishments. The major emphases in 1941 included service to young men in military and related defense service as one of six agencies composing the United Service Organizations for National Defense, with responsibility for operating approximately 140 clubs and centres, in addition to extending regular facilities everywhere. Service among 4,000,000 prisoners of war was also expanded through the World's Alliance at Geneva, and continued its 50-year-old program of international co-operation in thirty countries. Important meetings were the Sixth North American Assembly of Y.M.C.A. Workers with Boys at Louisville, Ky.; the National Physical Education convention at Berea college; the International Conference on Basic Membership Policies at Detroit, Mich.; the 24th Conference on Industrial Relations at Silver Bay, Lake George, N.Y., and special institutes for foremen and transportation workers. Other emphases included citizenship and public affairs, national uniform membership and program reporting, and public relations. Plans were laid by the national council for the centennial celebration of the founding of the Y.M.C.A. in London in 1844. (O. E. P.)

Young Women's Christian Association.

During 1941 nearly 3,000,000 women and girls had some share in the regular service program of the Y.W.C.A. carried on in its 1,470 local centres in the United States. As one of the agencies in the United Service Organizations for National Defense, Inc., the Y.W.C.A. also assumed responsibility for helping to meet the needs and problems of the large numbers of women and girls in communities affected by camp concentrations and defense industries. The Y.W.C.A. in 1941 continued its work with refugees from abroad as well as the raising of special funds through the Y.W.C.A. world emergency fund to aid the Y.W.C.A.'s in China, Europe and Great Britain in meeting the many emergency demands created by the war. Outstanding events in 1941 included a luncheon in honour of Lady Halifax, former president of the British Y.W.C.A. War Time Appeal, with an attendance of 2,500; the 60th anniversary, in April, of the younger girl group in the Y.W.C.A.—called "Girl Reserves" —in observance of which a nation-wide broadcast was arranged from Washington, D.C.; and a meeting at the national board headquarters in New York City at which Dr. A. Maude Royden of London, England, spoke on the subject "The World Crisis and Religion." President: Lilace Reid Barnes. (M. S. Ss.)

Youth Administration, National: *see* NATIONAL YOUTH ADMINISTRATION.

Youth Movements.

Such movements are an organized effort at political, cultural and social self-expression of young people.

In totalitarian states youth movements are on a nation-wide and compulsory basis; they are strictly regimented and made completely subservient to the aims of the state. How far this indoctrination had succeeded by 1941 was most interestingly revealed in a publication, Gregor Ziemer's *Education for Death*, which brought the most up-to-date firsthand observations of the youth movement in Germany. The German pattern of youth movement had been imitated, more or less successfully, in all states which came under national socialist control—in Italy and Spain, and later in Rumania and France. At the end of Aug. 1941, youth leaders from a dozen countries under national socialist control met at Breslau in Germany and laid the foundations for a new continental youth organization. The occasion was an athletic meet of the Hitler Youth which was proclaimed to be the first international "junior Olympics." Preparations were made for some form of common tie for the regimented youth of the "new Europe" under German leadership. In Spain a "youth front" was set up to have jurisdiction over all children between 6 and 18 years of age, whether they were in school or not, and was placed under the direction of the Falangist university students syndicate.

In the democratic countries like Great Britain and the United States only a small part of the young people were organized in youth movements, of which many, like the Boy Scouts and different church groups, were entirely apolitical. On the other hand others tried to play a definite political role, among them the American Youth congress, which was established in the summer of 1934 and was the centre of much controversy. While in 1940 the American Youth congress had maintained an uncompromisingly hostile attitude to American foreign policy and to what they called American intervention in "foreign" or "imperialist" wars, and had sided with the extreme noninterventionists, it somewhat, though only slightly, modified its stand in its session in Washington on Feb. 9, 1941. It proclaimed its opposition to all dictatorships but denounced the war in Europe as an imperialist war in which the United States should have no part. The entrance of the soviet union into the war in June 1941 brought, however, a complete reversal of the stand taken by these American youth organizations. They now advocated full American aid, not only to the soviet union but also to Great Britain and to all peoples fighting against fascist aggression. The foreign policy of the United States and its defense program were now fully backed. Meanwhile other new youth organizations had been formed throughout the United States which from the beginning supported the foreign policy of their country and in some cases went even further in advocating the fullest co-operation of the United States with all peoples fighting for the preservation of their freedom. (*See* also CATHOLIC YOUTH ORGANIZATION.)

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Yugoslavia.

A kingdom in southeastern Europe, divided up as a result of German aggression in 1941. Area 95,576 sq.mi.; pop. (est. Jan. 1, 1940) 15,703,000. Capital: Belgrade (266,849). Other chief cities: Zagreb (185,581); Subotica (100,058); Ljubljana (79,056); Sarajevo (78,173). Religion: 6,785,501 Greek Orthodox; 5,217,910 Roman Catholic; 1,561,166 Mohammedans; 231,169 Protestants; 68,405 Jews. King: Peter II (*q.v.*); prime minister, Gen. Richard Dushan Simovitch (*q.v.*).

History.—On Feb. 13, 1941 the Prime Minister Cvetkovitch and Foreign Minister Cincar-Markovitch went to see Chancellor Hitler. Long negotiations followed, and meanwhile Bulgaria's adherence to the axis pact put Yugoslavia into a very unfavourable strategic position. At the same time, the agitation of Croat extremists and the fascist-terrorist group of the Ustashi under the leadership of Dr. Ante Pavelitch, who directed the movement from Italy, caused concern to the Yugoslavs.

The Yugoslav government tried to arrive at a compromise with Germany, which had demanded not only signature of the axis pact but permission to send troops down the Morava and Vardar valleys to Greece, and additional military, political and economic concessions binding Yugoslavia firmly to the "new order." While the government deliberated, the democratic Serb parties who represented the vast majority of the population organized an opposition to Yugoslavia's surrender to Germany. The German minister to Yugoslavia, Viktor von Heeren, negotiated secretly with minority groups in Yugoslavia, promising "freedom" to the separatist groups in Croatia and Bosnia in exchange for their promise of neutrality in case of a Yugoslav-German conflict. The Yugoslav government tried to substitute a friendship and nonaggression pact with Germany for the demanded full membership in the axis. For several days Yugoslavia seemed to fluctuate between acceptance and resistance. Popular temper definitely changed in the latter direction. Undercover movements were organized to lead the resistance throughout the country in case of a German occupation. Finally on March 20 the Yugoslav cabinet accepted the German final terms for a settlement which would take into account the nonactive character of Yugoslav co-operation with the "new order." But the unrest of the people grew hourly. In the early morning hours of March 27, the 17-year-old King Peter II took over the government of the country, Prince Paul fled, and a new government under Gen. Dushan Simovitch, chief of the Yugoslav air force, was formed. In the new cabinet the Croat leader, Dr. Vlatko Matchek, was first vice-president.

The time left to the new government to prepare for the decisive struggle with Germany was much too short. On April 6 the invasion began, simultaneously through Hungary and Bulgaria and by April 16 the Yugoslav army had disintegrated. King Peter and his cabinet were forced to flee. (*See* WORLD WAR II.)

Large parts of the country were annexed outright by Bulgaria, Hungary, Germany and Italy. Southern Serbia (Macedonia) was annexed by Bulgaria; northeastern Yugoslavia, the fertile plains of the Banat, were annexed by Hungary, while Slovenia was divided between Germany, which annexed the northern part, and Italy, which annexed the southern part as an autonomous province of Ljubljana. Out of the remaining part of Yugoslavia, an "independent" new kingdom of Croatia was created, while in rump Serbia, under a German-instituted government of General Milan Neditch, the Serb population continued the struggle against the German invaders with an indomitable courage and an unparalleled heroism. Meanwhile the legal Yugoslav government continued to function in London,

PARTITION OF YUGOSLAVIA among Germany, Italy, Hungary, Rumania and Bulgaria after the axis conquest of April 1941

there it had found temporary refuge as one of the allied governments. (*See* also CROATIA; DALMATIA; MONTENEGRO.)

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(H. Ko.)

Yukon Territory. The most westerly of the northern territories of Canada, was created a separate territory in June 1898, by act of parliament (the Yukon act). Area, 207,076 sq.mi.; pop. 4,230 (estimate of dominion bureau of statistics, 1941.) At the height of the gold-mining boom 1901) the population was 27,219. Seat of government: Dawson 828).

The government in 1941 was composed of a chief executive, who is the controller, and an elective legislative council of three members, with a three-year tenure of office. The controller administers the government of the territory under instructions from the dominion federal government. The territory was represented in the house of commons as of 1941, by one member.

Education.—In 1941 there were five public schools and one Roman Catholic school with 185 pupils.

Transportation.—Transportation is largely by air, with landing fields at Dawson, Mayo, Whitehorse and Carcross, and emergency fields at McQuesten, Selkirk and Carmacks. There were 58 miles of railway and 324 miles of wagon roads in 1941.

Finance.—Ordinary revenue in 1938 was $213,712; ordinary expenditure, $212,597.

Industry.—The chief industry is mining, followed by furs and fish. Mineral production in 1939 was as follows: gold, 87,745 fine oz., valued at 3,171,192; silver, 3,830,864 fine oz., valued at $1,551,040; lead, 7,544,-32 lb., valued at $239,089; the total value was $4,961,321. Furs (1939): elts, 77,475; value $267,721; fisheries (1939): value $4,867.

(J. T. C.)

Zahle, Herluf (1873–1941), Danish diplomat, was born March 14 in Denmark. He entered the diplomatic service in 1900 and subsequently became minister to weden and Germany. In 1911 Zahle was named chamberlain to he king of Denmark. He was president of the Danish delegation o the League of Nations at Geneva from 1920 to 1927 and was resident of the League assembly in 1928. In 1925 he presided ver the International Opium conference at Geneva and sat as udge in the Permanent Court of International Justice in 1932 nd 1933. He was minister to Berlin in June 1939 when German Foreign Minister Joachim von Ribbentrop signed a nonaggression pact with Denmark. The news of his death was reported from Berlin May 4.

Zanzibar and Pemba: *see* BRITISH EAST AFRICA.

Zhukov, Georgi Konstantinovich (? –), Russian army officer, joined the Russian imperial army as a private in 1915. After the revolution, he attended the Frunze military academy, where he received his military training under Gen. Boris Shaposhnikov (*q.v.*), crack soviet strategist. He was then appointed commander of the Kiev military district, and later led tank units in the brief border war against the Japanese in Mongolia, 1939. He was named chief of the Red army general staff and vice-commissar for defense, Feb. 1941. During the nazi drive on Moscow in the fall of 1941, Zhukov was given command of the capital's defense forces on Oct. 23, replacing Gen. Timoshenko (*q.v.*), who was sent to the southern front. The German offensive at one time reached a point some 20 miles from Moscow, but there Russian armies held fast. Zhukov's armies launched a series of counter-attacks; in December, German defenses cracked under the hammering Russian blows, and Hitler's armies, ill-equipped to cope with the rigours of winter fighting, had fallen back by Dec. 31 on nearly all sectors of the immense Moscow front, with Russian armies in hot pursuit.

Zinc. In the accompanying table of world production of zinc, all figures were estimates except for the United States, and were subject to revision. Fairly large increases in output in Australia, United States, Great Britain and Canada, were largely offset by decreases in Belgium, France and Norway, leaving the world total only 3% greater than in 1939.

World Production of Zinc
(In thousands of metric tons)

	1929	1937	1938	1939	1940
Australia	50.8	70.9	70.9	70.8	85.0
Belgium	197.9	225.6	210.4	185.7	65.0
Canada	78.1	143.9	155.7	161.8	180.0
France	91.6	60.4	62.2	60.3	35.0
Germany	102.0	163.3	192.5	212.3	225.0
Norway	6.4	41.3	46.5	45.0	20.0
Poland	169.0	109.3	110.8	117.9	120.0
U.S.S.R.	3.4	70.0	80.0	90.0	85.0
United States	573.0	534.9	414.6	488.3	583.7
United Kingdom	59.2	63.1	56.2	50.4	60.0
World Total	1,472.8	1,667.9	1,589.7	1,678.1	1,732.0
Ex. U.S.	899.8	1,133.0	1,175.1	1,189.8	1,148.0

Production in the United States in 1940 included 666,400 short tons in mine output, 675,275 tons of primary metal (589,988 tons from domestic ores and 85,287 tons from imported ores), and 205,921 tons of secondary metal, all being heavy increases over 1939. Imports were down to 10,146 tons, and exports up to 79,091 tons, or a net export of 68,945 tons, against a net import of 36,445 tons in 1939. Production was not able to keep up with demand, and stocks at the smelters declined 64,516 tons during 1941.

Casting a balance for 1941, total output plus depletion of stocks, less net exports, left 670,846 tons available for consumption, as compared with an estimated actual consumption of 719,000 tons. This left a difference of 48,154 tons to be made up from consumers' stocks. All told, then, stocks were robbed of a total of 114,670 tons during the year, while at the end of the year smelter stocks were 19,212 tons and consumers' stocks 78,194, a total of 97,406 tons.

During the first ten months of 1941, mine production in the United States was 608,457 tons, and the year's total was estimated at 732,000 tons; metal production from both domestic and foreign ores, to the end of November, was 784,974 tons, or an estimated 860,000 tons for the year. Smelter shipments to the same date were 779,374 tons, including 685,836 tons for domestic consumption and 93,538 tons for export, and an estimated total of 853,000 tons for the year. Ore imports totalled 140,339 tons during the first three quarters of the year, an average rate of 187,100 tons for the year. Metal imports were 31,971 tons and exports 60,976 tons in the same period, a net export of 29,005 tons, but indications point to an increased rate for exports during the last quarter. There had been improve-

ment in the stock situation; smelters' and consumers' stocks at the end of October were 79,387 tons, against 97,406 on Jan. 1, a reduction of only 18,019 tons, against 114,670 tons in 1940.

Prime Western zinc was quoted at 7.25 cents per lb. in St. Louis to Oct. 9, and 8.25 cents per lb. for the remainder of the year, while the official maximum price in London for the same grade was £26 10s. per long ton.

Mine production of zinc in Mexico in the first seven months of 1941 totalled 69,181 metric tons, against 64,249 tons in the same period of 1940. (G. A. Ro.)

Zirconium. One of the largest plants for the recovery of zirconium is that at Byron bay, on the north coast of New South Wales, Australia, where beach sands are treated for the recovery of zircon and a concentrate containing 63% rutile and 37% ilmenite. Other sources are Brazil and India. Imports of zirconium ores into the United States in 1940 jumped to almost double anything previously on record, to 16,845 short tons, about half of which was from Australia. (G. A. Ro.)

Zoological Gardens. In the U.S. the St. Louis, Mo., zoo acquired the first specimen of the Guatemalan quetzel from Wolfgang van Hagen. Once the sacred bird of the Incas and Mayas, and worth about $4,000, this bird is the size of a pigeon. Some of the animals on the zoo ship "West Kebar," from South Africa, were drowned in a storm, but the rest arrived safely at Boston, Mass., for American zoos. In Canada three chimpanzees were received at the Toronto zoo from London, in exchange for an elk or moose after the war.

Dr. Raymond L. Ditmars prepared a report on the venomous snakes found in Central and South American areas where air bases may be established. Later he sailed for Trinidad to collect animals for a vampire bat cave. Capt. Jean Delacour was appointed consultant for the future development of the New York zoo park. The New York city aquarium closed and the African plains were opened in the Bronx park zoo. Zoological park directors decided to form a national association.

Europe.—In Britain, zoological gardens kept going in spite of enemy action, food shortage, reduced revenue and the difficulty of importing animals. *Animal and Zoo Magazine* ceased publication in June. In Regent's Park zoo there were about 2,600 animals worth about £40,000 at the beginning of 1941. The adoption scheme continued; regiments adopted their crest animals and *Punch's* Round Table, a lion. New arrivals included a wattled crane, Impeyan pheasants and tragopans and a pair of Senegal touracos from J. Spedan Lewis of Leckford near Winchester, a silver cock-pheasant from Watford and a two-toed American sloth. Losses included the Chilean sea-eagle, a spiny Echidna and Jean, the tame Bengal tigress.

At Whipsnade attendance improved. A depleted staff grew oats, wheat and root crops. An anti-rat campaign followed, the dead rats forming food for other animals. The herd of Chinese water deer was reduced. New stock included ten wallabies and three llamas presented by the duke of Bedford, a Manchurian crane and pairs of Asiatic white cranes and hooded cranes from Mr. Lewis' collection. Black swans bred and two baby camels and wallabies were born.

At Chester animals were re-grouped to economize heat and labour. More air-raid shelters and breeding tanks were provided. A lioness, a black panther and a leopard from Bristol and two white Bahrein donkeys from Edinburgh were among the evacuees received. Chester city education committee was making the zoo a money grant to enable children to pay visits free.

Manchester zoo successfully bred a lion cub. Edinburgh lost six budgerigars and a wild rabbit from enemy action. In a lecture, M. C. Thomson, curator of the aquarium, stated that Germany tried to claim a world record for keeping herrings alive for 14 weeks; Edinburgh had kept them for two years. Dublin opened a children's corner in the spring. (V. R.)

Zoology. Zoology in 1941 continued along essentially the same pattern of the last several years. No distinctly new trends emerged. The American Society of Zoologists met in December in Dallas, Tex., for an active session. A volume entitled *A Symposium on Hydrobiology* summarized much of the status of current research on limnology (fresh-water biology). A symposium held at the University of Chicago in September called "Levels of Integration in Biological and Social Systems" attempted to re-examine the relationship between biological and social organization.

Moore reported one of the interesting studies of the year in the field of physiology of reproduction. This worker studied the pouch young of the opossum. These animals are born as very immature individuals and finish their development attached for 60 to 70 days to mammary glands in the pouch of the mother. Thus they are excellent objects for experimentation since, in effect, they are mammalian embryos that develop for a time outside the maternal uterus. Moore treated these pouch young of both sexes with synthetic male and female sex hormones applied either as a skin ointment or by injection. After such treatment the young opossums were examined and the effect of the hormones on their reproductive system noted. Mammals have in their embryology both male components (Wolffian ducts) and female components (Mullerian ducts). In an animal that is to become a female the Mullerian ducts will form the fallopian tubes, uterus and vagina. In males the Wolffian ducts form part of the epididymis, a tube that collects spermatozoa from the testis. The Wolffian ducts in the adult female and the Mullerian ducts in the adult male become functionally degenerate. In the opossum Moore demonstrated, among other things, that (1) Wolffian duct stimulation by male hormones is relatively greater in females than in males; (2) Mullerian ducts in males show comparatively little response to male hormones, whereas in females tremendous precocious stimulation results from treatment; (3) Wolffian ducts in males respond less markedly to female hormones than do those in females, and (4) Mullerian ducts are not retained in their normal relations in males, whereas in females precocious differentiation occurs. This study because of its originality should stimulate further research in zoology on the important relation between hormones and embryonic development.

An instructive report on abnormalities of metamorphosis in the flour beetle *Tribolium confusum* was published by Roth and Howland. These investigators showed that the beetles as adults give off a gas which can be collected in sizeable quantities both in solution and crystalline form. The gas is liberated through special pores that lie in the thorax and abdomen. It was shown that when this substance, possibly related to the quinones, was brought into contact with developing larvae curious abnormalities resulted. For example, if large larvae are exposed they give rise to adults that lack antennae; if crystals of the substance are applied to the legs of older larvae an adult emerges with duplicated to triplicated legs. Not much is known of the mechanisms involved but the investigation is pregnant with ideas and techniques for future research.

There has long been interest in zoological circles in the spawning and migratory behaviour of the salmon. The current state of knowledge was summarized by Powers as follows: (1) Salmon spawn on characteristic spawning grounds in fresh water. (2) At more-or-less definite ages the young migrate to the sea. (3) After feeding and reaching maturity they return to these grounds to spawn. (4) The Pacific salmon dies after spawning while the steelhead trout and the Atlantic salmon may return to the sea and make a second or a third trip back to the spawning grounds. (5) A large proportion return to the original spawning streams and quite likely to the grounds upon which they were spawned. (6) This is not completely fixed; there is a certain amount of straying. (7) The movements from the sea to the spawning streams are facilitated by the freshets emerging from the streams into the ocean. (8) When the fish reach the mouth of the stream they respond to the water currents existing there. In addition to these established points Powers presented experimental data to show "that response of the salmon to carbon dioxide tension of the water is a dominant factor in determining the migratory movements to the sea and the return to spawning grounds." (*See* also MARINE BIOLOGY.)

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